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Prevention and Treatment of Contagious Diseases*

An Outline

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ALTHOUGH the incidence of contagious diseases has dropped off considerably during the past decade, severe sporadic cases with or without complications and small epidemics of these diseases are still a source of much trouble for the practicing physician. For this reason any new knowledge concerning prophylaxis and treatment is worthy of record. This is especially true of the more or less specific forms of therapy. Therefore the authors have thoroughly reviewed the recent literature and have carefully checked their own cases in order to present the following information in outline form for ready reference.

Mumps—epidemic parotitis

Prophylaxis — Fairly good results are obtained if human convalescent serum is administered intramuscularly before the seventh day of exposure.

Infant and young child—10 cc.
Older children—20 cc.

Treatment—Fairly good results have been observed if human convalescent serum is employed intramuscularly as early as possible after the onset of the disease. The serum therapy has been considered to be quite effective in preventing complications.

Infant and young child—20 cc.
Older children—40 cc.

Chicken pox—varicella

Prophylaxis—Questionable results are obtained when human convalescent serum is used. It has been employed to control outbreaks of the disease in institutions and is given within three days of exposure.

Young children—10 cc.
Older children and adults—20 cc.

Treatment—Results from the use of human convalescent serum are not conclusive and we cannot recommend its use at this time.

Smallpox—variola

Prophylaxis—In recent years, aside from the well known glycerinated-vaccinia vaccine and Lederle's brilliant green preparation, several newer antigens have been recommended. The chorion-allantoic chick embryo vaccine prepared according to the method of Goodpasture and the lyophile tissue vaccine of Rivers are new; the latter can be administered intracutaneously, being useful when children with skin diseases require vaccination.

Brilliant green vaccine gives the largest number of "takes."

Convalescent serum of little value.

Treatment—Sulfanilamide has been tried with no success.

Diphtheria

Prophylaxis—Two types of material are commonly used to immunize against diphtheria. Always do a Schick test within 3 to 6 months after the immunization is completed to determine whether immunity has been established. For practical purposes, the Schick

*Presented before the physicians attending the Postgraduate Lectures in Pediatrics in North Dakota, October, 1939.

From the Department of Pediatrics of the University of Minnesota.

test is the best index of the state of immunity.

Plain diphtheria toxoid

Infants—two 1 cc. doses 4 weeks apart.

Young children—0.5 cc., 1 cc., and 1 cc. at 2 to 4 week intervals.

Alum precipitated toxoid

Infants and children—two 0.5 cc. doses 4 weeks apart.

Variations of these doses must be used if reactions follow the initial injection.

Treatment—Highly purified (low protein content) diphtheria antitoxins are now available. The important thing in regard to dosage is to know how long the patient has been ill and to appreciate the severity of the disease. There has recently been a tendency to hold the dosage of antitoxin too low—this must be avoided.

Exposures—1000 to 2000 units intramuscularly.

Mild to moderately severe cases—10,000 to 50,000 units intramuscularly.

Seriously ill cases—50,000 to 80,000 or more units, one-third to one-half of which should be given intravenously. Occasionally an isotonic glucose solution is administered by vein along with the antitoxin.

Whooping cough—pertussis

Prophylaxis

Krueger's (endo-antigen) vaccine is not recommended.

Fresh vaccines (prepared in Michigan and New York states) are not available at the present time.

Sauer's vaccine (double strength—20 billion organisms per cc.) is of value when used well in advance of exposure. It is useless for immediate protection.

Infants and young children—3 single injections of 1.0, 1.5 and 2 cc. at weekly intervals. If a local reaction occurs, divide subsequent doses, injecting one-half in each arm.

Older children—vaccine not definitely recommended.

Pertussis Antigen Detoxified is prepared by growing the pertussis organism in shallow layers of a special medium. The toxic filtrate obtained from the culture when injected into the skin of humans produces swelling and erythema, and when employed in a more concentrated form simulates reactions produced by virulent hemolytic whole cultures. Treatment with formalin in a manner similar to that used in production of diphtheria toxoid converts the toxic factor into a non-toxic substance having antigenic properties.

Dosage—3 injections of 2 cc. each at weekly intervals.

Future observations may indicate change in dosage schedule.

Hyperimmune human serum obtained from healthy male adults (21 to 25 years in age) who have had pertussis in childhood and who have just received three courses of Sauer's double strength vaccine at three-month intervals over a period of one year. It is considered to be of some value for immediate protection. The injections are given intramuscularly.

Children under 4 years—10 cc.

Children over 4 years—20 cc.

It is advisable to give a second dose a week after the first one.

Treatment—The possible production of adequate immunity takes so long that there is little or no purpose in giving vaccines. Some writers, however, still insist that they have received fairly good results with vaccine therapy.

Sauer's vaccine is not recommended.

Krueger's endo-antigen has been employed—0.5 to 2 cc. daily for 7 to 10 injections.

Pertussis Antigen Detoxified has been recommended—1.5 to 2 cc. for 3 to 5 injections every 2 or 3 days.

Hyperimmune human serum appears to be of value if given early in the disease.

Suggested dosage—20 cc. at 2 or 3 day intervals until 3 doses have been administered intramuscularly.

If improvement follows, it is advisable to give 1 or 2 additional doses at 5 to 7 day intervals in order to prevent a relapse.

If no improvement after the third dose, it is doubtful if more serum will be of any value.

Sulfanilamide may control the bronchopneumonia which complicates pertussis.

Scarlet Fever

Prophylaxis—Active immunization with the "naked" scarlet fever streptococcus toxin is not recommended except in case of doctors, nurses, and attendants in contagious hospitals, and children in orphanages, preventoriums, sanatoriums and nursing homes.

The new scarlet fever streptococcus toxin is prepared in a semi-synthetic medium free from added blood or serum and in which the maximum protein content is limited to 1 per cent peptone. Approximately 80 per cent of the non-specific reactions are eliminated through the use of this medium.

Dosage—5 graduated doses of the toxin are given at weekly intervals. The injections are made subcutaneously in the region of the insertion of the deltoid. The strength of each dose is as follows:

1st dose— 650 skin test doses contained in 1 cc.
2nd dose— 2,500 skin test doses contained in 1 cc.
3rd dose— 10,000 skin test doses contained in 1 cc.
4th dose— 30,000 skin test doses contained in 1 cc.
5th dose—120,000 skin test doses contained in 1.1 cc.

Reactions are common and may prevent the completion of the immunization procedure.

Scarlet fever toxoid—unfortunately it is not available at the present.

Human convalescent serum is of value for immediate protection. All injections are given intramuscularly.

Infants and young children—10 cc.

Older children and adults—20 cc.

Sulfanilamide when given orally at the same time the serum is administered appears to assist in the prevention of the disease. The drug is given up to expected time of onset of the clinical symptoms of scarlet fever.

Treatment—Commercial scarlet fever antitoxin is now highly purified but still it produces serum reactions. It may be used to combat the toxicity of severe infections.

Young child—6000 units or one ampoule.
Older child—12,000 units or two ampoules.

Human convalescent serum eliminates the serum reactions. No skin testing is necessary before its administration. It can be given intravenously. No sensitization of the patient occurs.

	Moderate Cases	*Severe Cases*
Infants	20 cc.	40 cc.
Children	20 to 40 cc.	60 cc.
Adults	40 to 60 cc.	80 to 100 cc.

Sulfanilamide is very effective in doses which are able to produce a blood concentration in the patient of 10 mg. per 100 cc. In fact, early intravenous human convalescent serum to combat toxemia combined with adequate doses of sulfanilamide appears to be the best treatment.

Erysipelas

Prophylaxis—nothing specific.

Treatment—Commercial erysipelas antitoxin is not recommended.

Ultraviolet ray therapy still gives good results if used as directed—8 to 15 minutes exposure at a distance of 8 inches.

Sulfanilamide has been of definite value in the very young and old, who have the highest mortality rates. The doses for this drug are given later in the outline.

Human convalescent scarlet fever serum has given good results. The dose varies with the age of the patient and the severity of the disease. It is about the same as that for scarlet fever.

Measles

Prophylaxis—Placental globulin extract has become very popular as a preparation which can reduce the severity of an attack of measles, and thereby permit in some instances a lasting immunity to develop with little danger to the patient. Some writers have reported painful local reactions.

Infants—one 2 cc. dose injected intramuscularly.
Children—two 2 cc. doses 2 to 4 days apart.

Human convalescent serum is of great value and there are no reactions.

Complete protection—inject intramuscularly within 5 days of exposure.

Infants and children under 5 years—5 cc.
For each year over 5 years add 1 cc. up to 15 cc.
Adults—15 to 20 cc.

Modification of the disease—inject intramuscularly as follows:

One-half of the above doses during first 5 days of exposure.
Full doses on the sixth and seventh days of exposure.

When serum is given on the eighth day or later, there is no assurance of either protection or modification.

Treatment—Human convalescent serum has been of value in some cases. One of us (A. V. S.) has observed a definite lowering of the incidence of the bronchitis which accompanies many cases of measles. The serum may be given either intramuscularly or intravenously.

Infants and young children—15 to 20 cc.
Older children and adults—20 to 40 cc.

Sulfanilamide—The bronchopneumonia seen with this disease is usually due to streptococci and responds to sulfanilamide.

Poliomyelitis—infantile paralysis

Prophylaxis—Kolmer's vaccine and Brodie's vaccine are not recommended.

Zinc sulfate nasal spraying is difficult to perform properly by the general practitioner and cannot be done quickly enough to meet the emergency of an outbreak. It is not considered to be a practical prophylactic measure.

Human convalescent serum is of doubtful value although the dose has been increased from 20 cc. to 100 cc. injected intramuscularly.

Treatment—Human convalescent serum has not given satisfactory results. However, many physicians still feel it should be employed and administered intravenously.

Children—100 cc.
Adults—200 cc.

Sulfanilamide has been of no value.

Drinker respirator:

The respirator is of unquestionable value in the treatment of those patients with high spinal involvement. The machine gives them the rest so essential for recovery.

The respirator is of little or no value in the care of patients whose respiratory difficulty is bulbar in origin. The machine may overpower the choking and cough reflexes and in some cases even cause forcible aspiration through the larynx of secretions from the throat.

The bulbo-spinal cases may respond to the Drinker respirator provided the pharyngeal paralysis is unilateral. If the paralysis is bilateral and the patient cannot swallow the machine is ineffective.

Epidemic meningitis

Prophylaxis—Contacts who have positive throat cultures for the meningococcus have been given moderate doses of sulfanilamide until the organisms have disappeared from the throat.

Treatment—Specific antiserums are still used by some physicians especially in late cases of the disease. They are administered intrathecally and intramuscularly.

Specific antitoxin is given intravenously in massive doses thereby quickly neutralizing any toxins liberated by the organisms of all the groups of meningococci.

Children—50,000 units.

Adults—100,000 units.

The antitoxin is diluted with equal parts of isotonic saline to which is added 0.5 cc. of 1—1000 epinephrine solution and administered very slowly. Usually the preparation is given daily for 3 to 5 days and then the clinical and spinal fluid findings will indicate if more therapy is necessary.

Sulfanilamide strikes the meningococcus very hard. In our hands, chemotherapy has been very successful.

Intrathecally—0.8 to 1 per cent of sulfanilamide in isotonic saline—10 to 40 cc.

Subcutaneously—0.8 to 1 per cent of sulfanilamide in isotonic saline—at least 100 cc. per 40 pounds of patient's weight.

Repeat both forms of therapy every 8 hours for at least 2 days, and then once a day until definite improvement appears. The subcutaneous therapy is usually continued the longest until the patient regains consciousness and can swallow adequate doses of the sulfanilamide.

All forms of therapy should be continued until the spinal fluid remains free of meningococci. Sulfanilamide produces this condition in the shortest period of time.

Sulfanilamide for Contagious Diseases

Chemotherapy with sulfanilamide and related compounds had its onset with the observations of Domagk in 1935. Since then numerous derivatives of these drugs have been synthesized but the therapeutic value of many of them await further investigations. Much has been learned about sulfanilamide. Much more need be learned before widespread use can be made safe. The mode of action, optimal dosage, and allergic or toxic effects are not yet completely understood. Indiscriminate use of the drug is to be condemned. Administer cautiously, and watch the patient from day to day.

Dosage of Sulfanilamide. Due consideration should be given to the requirement in the individual case, that is, to the severity and duration of the infection, the age, and general condition of the patient. One of the most important considerations is the maintenance of an adequate and constant concentration of the drug in the blood and tissues of the body. To assure maximum effect, the administration must be suitably regulated in regard to dosage as well as frequency. It must further be remembered that smaller doses at regular intervals are more effective than larger doses at irregular intervals.

Severe infections—The following dosages are recommended. It is highly desirable to rapidly build to a high level the concentration of the drug in the blood and tissues. Always specify the number of days the drug is to be continued.

Sulfanilamide orally. An initial dose of ¾ grain per pound of actual body weight is given followed by a maintenance dose of ½ grain per pound daily divided equally into 6 parts and administered every 4 hours. Sodium bicarbonate (grains 5 to 10) is administered with each dose to reduce gastric irritation and prevent acidosis. For the initial dose, it is better not to give the bicarbonate because the patient will have difficulty in swallowing too many tablets. The following schedule may be referred to:

Patient's Weight	*Initial Dose*	*Maintenance Dose*
10-25 pounds	Grains X (10)	Grains IIss (2½) every 4 hrs.
25-30 "	" XV (15)	" V (5) every 4 hrs.
30-40 "	" XX (20)	" VIIss (7½) every 4 hrs.
40-50 "	" XXV (25)	" X (10) every 4 hrs.
50-60 "	" XXX (30)	" XIIss (12½) every 4 hrs.
60-70 "	" XXXV (35)	" XIIss (12½) every 4 hrs.
70-80 "	" XL (40)	" XIIss (12½) every 4 hrs.
80-90 "	" L (50)	" XV (15) every 4 hrs.
90-100 "	" L (50) to	
Over 100 "	" LXXX (80)	" XV (15) every 4 hrs.

Occasionally difficulty has been encountered in getting infants and children to take the required amount of the drug by mouth. In these cases a stable preparation of sulfanilamide in a non-toxic solution of glucose, sodium lactate and potassium citrate has been employed. The preparation* contains approximately 2 grams of sulfanilamide to each fluid ounce or 15 grains to the tablespoonful and 4 grains to the teaspoonful (fluid dram). No sodium bicarbonate is used when this solution is administered.

Sulfanilamide subcutaneously. The powder may be dissolved in physiological or isotonic saline brought up to the boiling point in a concentration of 1 per cent. The solution should be clear and colorless. No solution which is colored or older than 3 days should be used. Crystals which form on cooling will dissolve by warming the solution to body temperature. The following schedule for the administration of the drug subcutaneously has proven to be very satisfactory:

Patient's Weight	*Initial Dose*	*Maintenance Dose*
20-30 pounds	100 cc.	100 cc. every 8 hours
30-40 "	200 cc.	150 cc. every 8 hours
40-50 "	275 cc.	175 cc. every 8 hours
50-60 "	300 cc.	200 cc. every 8 hours
60-70 "	375 cc.	225 cc. every 8 hours
70-80 "	425 cc.	250 cc. every 8 hours
80-90 "	475 cc.	275 cc. every 8 hours
90-100 "	500 cc.	300 cc. every 8 hours
Over 100 "	500 cc.	500 cc. every 8 hours

Therapy (oral or subcutaneous) should be continued as outlined above until favorable clinical effect is obtained. Then the dosage should be cut by ⅓. If improvement continues, dosage is further cut by ⅓ and held at that point until convalescence is well established. The subcutaneous administration should be discontinued as soon as the patient can take the drug orally.

Moderately severe infections: The dose of sulfanilamide may be as follows:

Children—grains V (5) to X (10) orally every 4 hours.

*Prepared by Donley-Evans & Co., St. Louis, Missouri, and identified as Sulfanilamide with Citra-Lactate.

Adults—grains X (10) to XV (15) orally every 4 hours.

Mild infections: Sulfanilamide is not very effective in many mild infections.

Children—grains V (5) orally 3 to 4 times daily.

Adults—grain V (5) to X (10) 4 times daily.

Immunization Program for Contagious Diseases

In this part of the country the incidence of whooping cough is higher than that of diphtheria and smallpox. Therefore the immunization procedure for pertussis may be started first. Inoculations for the prevention of diphtheria and vaccination for smallpox may follow. The age periods which are given for these various procedures are as early as practical for there is always a tendency for the physician and the parents to delay the immunization program. An early start is the best policy.

Whooping cough—3 months to 6 months of age.

Diphtheria—6 months to 9 months of age.

Vaccination—with the last diphtheria inoculation.

Schick test—12 months to 15 months of age.

Scarlet fever—15 months in the large child, 18 months in the small child (not highly recommended).

Schick test—repeat after 24 months of age.

Schick test and smallpox vaccination again before the child attends school. Re-immunize against diphtheria if necessary.

The Student Health Service Physician

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THE student health service physician appeared in our college communities about 75 years ago with the appointment of Dr. John W. Hooker[1] as professor of hygiene at Amherst college. He is the first student health service physician of record in the United States. Two years later his health was so impaired that he was succeeded by Dr. Edward Hitchcock, Jr., A.M., M.D.,[1] who was regarded "as an educated physician."[1] The chief measure of health in those days was the degree of development of the musculature of the body. It was only natural then, that the professor of hygiene's activities would be centered in the gymnasium and that his chief interest would be in physical education. Anthropometrical measurements would naturally be a good index of health so conceived and we find that Dr. Hitchcock systematically and periodically recorded, "weight, height, girth of chest, arm, forearm and body lift."[1] "The number of tests of strength and measurements of bulk"[1] were steadily increased until by 1885 they had reached the number of 50. By that time (1885) six or seven "colleges (in the United States) had employed physicians chiefly in connection with their departments of physical training"[1] and "anthropometry was in full flower."[1]

During the next twenty-five years sanitation, communicable disease control and the medical examination as we know it today were appearing on the medical horizon and assuming more and more importance in the preservation of health. As these newer developments in health increased in importance, anthropometry as an index of healthfulness waned. Health services became less intimately associated with physical education departments; in fact in many schools they became separate and distinct departments. This ever-increasing divergence of health development from physical education slowly crystallized into a demand for a National Student Health Association, and in 1920 the American Student Health Association was organized. Tradition is hard to break and the new health association held its meetings in conjunction with the older parent physical education associations. Medical influences in student health affairs, however, continued to increase and physical educational ones to decrease until two years ago the American Student Health Association voted to hold its meetings independently of the physical educators, and thus officially ended one of the phases of student health development which had in fact been dead for many years. During this transitional period the number of student health services slowly but steadily increased. There is every reason to expect their number will continue to increase even more rapidly in the future, because the personnel and guidance programs now being fostered in educational institutions are by their very nature dependent on an excellent scientific type of *medical* student health service. For this reason such educational standardizing agencies as the North Central Association are now including the type and quality of a student health service among the factors used in the grading and approval of colleges. This educational dependence on medical knowledge undoubtedly marks the advent of a new phase of student health service evolution and a new type of student health service physician—one who will be more educationally minded than ever before.

In 1931 the first conference on College Hygiene attempted to formulate the qualifications of a student health service physician. There apparently was some vagueness in their minds as to just what a student health service physician should be, for their statement about him is very far from concise. They stated that a student health service physician should have, "a medical education, broad interests in clinical, preventive, and investigative medicine, in institutional problems in general, and

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his own in particular, in local, state and national health problems, and in problems of human social relationships and an educational point of view."[2] The second conference on College Hygiene in 1936 elaborated slightly on the 1931 qualifications and added a new section on the desirable characteristics of the man (or woman) himself (or herself) adding that he "should have a pleasing personality, be socially acceptable in a college and university environment, and with character beyond reproach."[3] They were still in 1936 oblivious to the impending educational demands on the student health service physician. Schwitalla[4] and others[5,6] have called attention to many other desirable qualities and characteristics of the student health service physician. All these may be grouped under three main headings: (1) the man, (2) his professional training, and (3) his interests.

As a man he should be socially acceptable, a friend, a leader, a wise and human counselor, a diplomat, a humanist, a student guide at least in attitude; he must possess sympathy and understanding and an irreproachable character, and he must appreciate that moral living is essential to health. His professional training should have been such that he is a scientist, a biologist, a biochemist, a physiologist, a pathologist, a graduate of a grade "A" medical school, a diagnostician, an internist, a psychologist, a psychiatrist, an epidemiologist, a vital statistician and a public health expert; he must have an understanding of the relationship of constitutional development and heredity to disease, the principles of research and at least two or three years clinical experience. He should be interested in nursing and health problems, local, state and national; scientific clinical, preventive, and research medicine, and should exhibit such interest by membership in medical societies and the cultivation of friendly relationships with his colleagues in other fields of medicine. He should be an educator in spirit. He must have at least a working knowledge of educational institutional relationships in general and his own in particular such as educational and achievement research, the formulation, the interpretation and application of University policies, educational retardation and superiority, disciplinary problems, academic regulations, special educational programs and the educational relationship to constitutional and physical health. He should furthermore be a public relations expert and be interested in human social relationships such as an understanding of youth and its problems and the social component in disease.

This composite picture of the man (or woman) I would not change, for I think he (or she) should possess all of these qualities. But in the professional field and interests this is indeed a large order and I feel sure that many of us, including myself, would find it difficult to establish our right to call ourselves student health physicians when judged by this composite criterion. However, I believe that a simpler classification of professional qualifications and interests might serve to give a clearer view of this man, the student health service physician, a specialist, without sacrificing anything essential in the more detailed composite picture of him that I have compiled.

I would propose that he be (1) a biologist in a broad and practical sense, (2) a good clinician and internist, (3) a mental hygienist, (4) a *clinical* public health expert, (5) a clinical medical and educational investigator, (6) that he be trained to appreciate thoroughly educational institutional policies, problems and special programs, and (7) the broad principles of human social relationships. Of these, there are two that I wish to comment upon, namely mental hygiene and educational institutional policies, problems, etc.

In general, the mental hygiene problems of the college student are neither those of pure psychology nor pure psychiatry, but are largely those of mental adjustment to the complex social order of our present-day civilization. Undoubtedly psychological principles and psychiatric understanding are vital to their solution, but a new clinical field partaking of both must be created to vitalize such a program of mental *adjustment* limited to the college age group. Such a mental adjustment program must be integrated into and correlated with institutional educational research, guidance programs, personal studies, university policies, etc.

The educators of today are deeply interested in personnel studies and guidance programs, but they feel insecure—and properly so—in proceeding with their program without a medical evaluation of each individual; hence they are eager for student health service coöperation to further their educational plans. To both educator and student health physician I would like to sound a word of warning. A too free and injudicious use of student health knowledge about the individual student may do untold harm to both the student health and personnel programs. Confidential relationships have been one of the cornerstones on which the clinical practice of medicine has been built. It is a tried and true safeguard against medical errors. A truthful statement of a patient to a physician has in untold instances prevented the physician from making a fallacious judgment in the care of a serious ailment. Such truths can often only be elicited when the patient feels confident the trust will not be violated. If students become distrustful of the student health service because of too free an exchange of information between student health physician and personnel officer, and feel that their confidences are being violated, the student health service records will become incomplete and the information needed to make both student health and personnel programs successful will be wanting. The only answer then, seems to be to continue zealously to keep the confidential relationship of student and student health physicians inviolate and to have administrative and personnel officers place implicit faith in the judgment of the health service physician. In return, the health service physician must justify this faith by thoroughly understanding the objectives, purposes, etc., of administration and personnel studies. In other words he (or she) must have a good working knowledge of a dean's office, its problems and their solution according to current educational beliefs.

The man who possesses all of these qualities of nature and training today is a biological and educational accident, for there is no standard educational program given

by any institution of higher learning designed to produce such a specialist. There is not apt to be such a program in the near future because the standardizing agencies of medical education have not recognized the student health service physician as a specialist. They are not likely to so recognize him in the near future for their attitude toward him is antagonistic. However, if the demand for such men by educational institutions continues, sooner or later someone will recognize the need for a training program for the student health service physicians and will make attempts to establish such training schedule. The broad program of such training would not be hard to visualize. Its integration into concrete university and professional courses would be somewhat more difficult.

In conclusion, I would like to look upon the current successful student health service physician as a biological educational accident, the result of an evolutionary process that has passed through several stages such as physical education, sanitation, infectious disease control, modern clinical medicine, and one who is now upon the threshold of an educational phase; which may well make him a very influential factor in the immediate future of education but who has not as yet consolidated his position to such a degree as to make all of his potential influence as forcefully felt as it should be in the educational field. Until his training becomes adequate to meet his responsibilities prior to their assumption, his prominence and influence in educational development will continue to be insecure.

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Thoracic Disease Giving Abdominal Signs and Symptoms*

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SOME of the greatest men of medicine have experienced difficulty with the differential diagnosis of thoracic and abdominal disease. Osler wrote, "When an elderly patient consults you for dyspeptic symptoms, always think of them as being the first signs of heart trouble." Cabot analyzed over 15,000 patients complaining of digestive disturbances and found extragastric lesions to be causing the symptoms in 84 per cent; heart failure was the greatest cause. The point may be carried farther. The literature, recent as well as old, contains instances of central pneumonias in children, and diaphragmatic pleurisies in adolescents, which were operated on by good men as abdominal emergencies. Therefore, I offer this resume without apology.

Chest disease may give abdominal symptoms by contiguity of structures separated only by the diaphragm; by means of the circulation, mechanically as in the case of a failing heart or by carrying toxic products to the abdomen as in the case of a pneumonia; and by reference of nervous impulses from thoracic stimulation to the abdominal viscera and parietes.

The interrelations of the thoracic and abdominal nervous systems are so numerous that it is small wonder that the post central gyrus of one's cerebrum experiences difficulty in determining the source of some impulses relayed to it. We know that while the visceral pleura is devoid of pain sense, the parietal pleura is richly supplied with sensory fibers from the intercostal nerves and probably also from the sympathetics. Let us then consider the distribution of the intercostal nerves. The lower six thoracic nerves, besides supplying the lower third or more of the parietal pleura and the costal portion of the diaphragmatic pleura, also supply the whole abdominal wall, including the skin and muscles. This shows us that confusion is possible because of the distribution of the intercostal nerves which are a part of the cerebrospinal nervous system. Confusion is also possible because of the distribution of the autonomic nervous system with its two opposed parts, the parasympathetic which, as Cannon has stated, is concerned with individual organ effects in quiet reserve-producing action, and the sympathetic system, its antagonist, producing sudden and diffuse effects. The parasympathetic system so far as we are concerned here consists of the vagus nerve which arises in the medulla oblongata and passes down to depress the heart functions, to constrict the coronaries and bronchi, to stimulate alimentary motor activity, to relax the bowel sphincters, to stimulate secretion in the pancreas and gastric glands and maybe in the liver and kidney also. It is theoretically possible that strong stimuli intended to meet thoracic emergencies might spill over into the abdominal fibers of the vagus and so affect abdominal organs.

The other part of the autonomic nervous system, the sympathetic, has a more segmental origin. We know that the sympathetic fibers supplying the heart and lungs arise from the first four thoracic segments and should

*From the surgical service of the Quain & Ramstad Clinic.

not give referred pain in the abdomen. There are, however, connecting fibers extending down the sympathetic chain, as they do also in the spinal cord, for several segments, and so impulses arising in these organs can pass to a lower level and so affect the nerves supplying the upper abdomen. We also know that the sympathetic nerves supplying the alimentary tract, from the stomach to the small bowel, are relayed through the celiac and superior mesenteric ganglia from the greater and lesser splanchnic nerves, which in turn arise from the fifth to the twelfth thoracic segments of the spinal cord. Here again, strong stimuli intended to meet thoracic emergencies theoretically can spill over into the abdominal sympathetics and so inhibit peristalsis, tightly close the sphincters of the bowel and inhibit secretion of the abdominal glands.

We have mentioned spilling of impulses from one system to another. This is difficult to visualize without a consideration of the mechanism of referred pain and Mackenzie's irritable focus. Head stated, "When a painful stimulus is applied to a part of low sensibility in close central connection with a part of much greater sensibility, the pain produced is felt in the part of higher sensibility rather than in the part of lower sensibility to which the stimulus was actually applied." For example, let us consider a heart with an area of infarction from which painful stimuli arise. They pass by sympathetic sensory fibers to the posterior horn of the spinal cord. From there they are meant to traverse the spino-thalamic tract across the cord and up to the consciousness. However, there also are nerves running from the body wall, which corresponds to Head's part of higher sensibility, to the same area of the spinal cord. Our brain is more accustomed to receiving pain impulses from the skin than from the heart and so refers the pain to the skin. This illustrates a viscero-sensory reflex. The same example nicely illustrates a viscero-motor reflex. About the posterior horn cells where the sympathetic impulse is relayed to the spino-thalamic tract is the area designated by Mackenzie as the irritable focus. In this area is another nerve cell which can pick up the stimulus and carry it to the anterior horn cells and there relay it as a motor impulse and so cause spasm of the corresponding body wall. This principle is quite well accepted and may be applied to other nerves as well.

We may conclude by stating that cardiac pain may be referred to the abdomen over the fifth and sixth thoracic nerves, pleuritic pain over the sixth to the twelfth thoracic, lower lobe lung pain over the sixth to the twelfth thoracic, and aortic disease over the seventh to the ninth thoracic nerves. Pain in any instance may be referred to the opposite side to the lesion due to strong stimulation across the segments of the cord.

Let us attempt to differentiate between true abdominal wall rigidity due to irritation of the parietal peritoneum and abdominal wall tenseness due to referred stimuli. Gentle palpation, as Aynesworth has stressed, will disclose some measure of relaxation between the respiratory movements in chest disease, but never in real muscle rigidity of intra-abdominal disease. Voluntary relaxation is possible with tension, but never with rigidity. Cutaneous and muscle tenderness may be identical in the two conditions, but deep tenderness elicited by pressure with the flat hand and increasing with attempted muscle relaxation is absent in thoracic disease; it is present in muscle rigidity from peritoneal irritation. To summarize, the tenderness and tenseness of the abdomen found in acute thoracic disease are confined to the abdominal wall and our examination must bring out this point.

Now, let us consider specific chest disease which may be confused with abdominal disease. Musser has stated, "The abdominal symptoms of coronary occlusion might almost be said to be classic, although, of course, the thoracic expression of coronary occlusion is more common than is the abdominal." Instances of confusion of myocardial infarction with perforated peptic ulcer, gallbladder colic, acute hemorrhagic pancreatitis, mesenteric thrombosis, epigastric and diaphragmatic hernia and hemorrhage into the suprarenal capsule are available. There may be nausea and emesis, abdominal distension, some degree of shock, muscle tension and tenderness and fever in coronary lesions. In one large series, 83 per cent of the cases of coronary thrombosis had abdominal pain. From Johns Hopkins Hospital came a report of both anterior and posterior wall infarcts, from occlusion of both left and right coronary artery branches, all of which gave abdominal pain. Left coronary lesions are more apt to give abdominal symptoms early. Right coronary lesions are more apt to give abdominal symptoms later through a distended, tender liver. Coronary thrombosis may also occasionally give jaundice. Congestive failure or pulmonary infarction is usually present in such cases. Icterus is due to obstruction of the intrahepatic ducts by congested vessels, to increased destruction of stagnated red cells, and to anoxemia of the hepatic excretory cells.

Let us consider the differential diagnosis of coronary thrombosis and abdominal disease in general. The former age group averages 58 years, the latter about 47 years. Males preponderate in thrombosis and ulcer while females preponderate in gallbladder disease. The past history is important. A thrombosis patient probably has had precordial discomfort, chest compression, dyspnea, tachycardia, palpitation, and irregular rhythm associated with activity. In abdominal disease we expect a history of indigestion, eructations and flatulency, related to the ingestion of food or particular foods, and occurring during rest. We also look for periodicity in relation to meals, and a longer history in abdominal disease. The attack, itself, may simulate either condition, but the sudden pain of coronary thrombosis, associated with the fear of impending death, chest oppression, dyspnea, radiation of pain to upper chest, arms, shoulder or neck, separates it from abdominal disease. Cardiac pain rarely radiates to the back and is usually more steady and diffuse while abdominal disease pain is more apt to be colicky and localized. Also, abdominal pain in coronary disease usually has associated retrosternal pain. Either type of attack may follow a heavy meal and be partially relieved by emesis or belching.

Examination of both the thrombosis patient and the gallbladder or ulcer patient may show fever, leucocytosis,

rapid pulse and upper abdominal tenseness. True rigidity is found only in local abdominal disease. The cardiac patient is more likely to have an ashy cyanosis and orthopnoea, and we look for cardiac enlargement, weak first sounds, arrhythmias, evidence of retinal or radial artery sclerosis, acute emphysema, fine moist râles, precordial friction rub and lowered blood pressure. The rub may be extremely evanescent, persisting only a few minutes. The fall in blood pressure may occur early or only after weeks have passed and in many cases we have no record of previous pressure readings. A perforated viscus usually has true, generalized, abdominal wall tenderness and rigidity and X-ray examination may show gas under the diaphragm or the abdominal wall. The electrocardiographic changes of coronary thrombosis are typical, but may not appear for hours or even days and so might be misleading if a normal tracing were obtained early. We look for inverted T-waves, Pardee curves, or S-T intervals off the isotonic level, intraventricular and auriculoventricular blocks. At this point, let us remind ourselves that since Butsch, McGowan and Walters have demonstrated relaxation of the biliary ducts by nitrites, we can no longer say that pain relieved by nitrites is necessarily due to angina pectoris. Also, the pain of coronary thrombosis is not relieved as is angina pectoris.

Another group of thoracic diseases frequently giving abdominal signs and symptoms is that group resulting in slow cardiac decompensation, the chief representatives of which are slowly progressive coronary sclerosis, fatty heart, chronic rheumatic pancarditis, adhesive pericarditis, and chronically dilating hearts with old valvular defects. There may be but little local evidence of heart disease and flatulence may be one of the most striking symptoms. Distress often begins with the taking of food; the abdomen distends, dull abdominal pain occurs, and gaseous eructations are common. Expulsion of gas gives marked relief. In these cases striking abdominal findings may be encountered also, distension, ascites, tenderness, especially of the right subcostal area, splenomegaly, distended, superficial epigastric veins and mild jaundice. Diarrhea may be an early symptom of heart failure, and ascites may be the only form of dropsy, particularly in mitral stenosis, which also frequently gives hepatic congestion, subicteric tinge to the sclerae, gastric atony, and suppression of acid production. Cardiac thrombi and valvular vegetations of bacterial endocarditis, when loosened, may result in abdominal infarcts and mimic any abdominal disease. Ascites, tumor, chronic gallbladder lesions, duodenal ulcer, hepatic cirrhosis, Banti's disease and tuberculous peritonitis must be considered in the differential diagnosis.

Gager reported two cases of dissecting aneurysm of the thoracic aorta which were operated on for perforated peptic ulcer. Here, usually there is a past history of long standing hypertension and of no previous abdominal distress. Forty per cent of the cases reported by Glendy gave a history of effort or excitement immediately preceding the onset. Leucocytosis may reach 20,000, and fever is common. The pain is extremely sudden in onset, situated usually in the thorax, both front and back, but may be entirely abdominal if the lesion is low in the thorax. The pain is described as tearing or crushing and usually has wide radiation. The patient is almost always severely prostrated in spite of a blood pressure which is found to be quite well maintained. Dysphagia and gastric symptoms may result from simple thoracic aneurysms, congenital vessel anomalies and enlarged left atria.

As Brooks has stated, often the most striking symptom of acute pericarditis is severe epigastric or para-umbilical pain. Usually, it is just below the ensiform cartilage and often gives nausea, emesis, upper abdominal tenseness, and hyperesthesia. An acute gastric or duodenal ulcer must be differentiated. A friction rub may be heard early; fluid often obscures it later. Faint, distant heart tones with a full, vigorous pulse are suggestive, and widened cardiac percussion dullness to both left and right, together with roentgen evidence of decreased pulsation and a typical leather-bottle, rounded cardiac contour, are diagnostic.

Auricular flutter and paroxysmal tachycardia also may at times be confused with abdominal disease as shown by the case reported by Gager of a young girl with abdominal symptoms who first saw a surgeon, then a psychiatrist and finally an internist before auricular flutter was diagnosed.

Many patients with incipient pulmonary tuberculosis present symptoms of indigestion, nausea, anorexia, abdominal pain, flatulence, constipation or diarrhea. We know that intestinal tuberculosis is the most frequent complication of the lung disease, but these patients may give referred symptoms even though no demonstrable intestinal tuberculosis is present. Brown of Saranac Lake reported 40 patients free from intestinal involvement, of whom 12.5 per cent presented diarrhea, 17 per cent abdominal pain, 7.5 per cent nausea and emesis, and 15 per cent general digestive disturbances. The pain of actual bowel involvement is apt to be more severe, more crampy, better localized in the ileocecal region, and the diarrhea is more persistent. A careful barium enema is necessary to rule out actual involvement of the bowel with tuberculosis.

Spontaneous pneumothorax at times simulates acute abdominal affections, especially perforated ulcer and acute appendicitis. Joress reported two cases, occurring five and fourteen days after refills for artificial pneumothorax therapy, which narrowly escaped abdominal exploration. Intense abdominal pain, nausea, emesis, and right-sided abdominal hyperesthesia and tenseness suggest appendicitis. Sudden pain after exertion with radiation to the shoulder, collapse, and generalized abdominal tenseness suggest a perforated ulcer. Yet, every one in a series of eight cases of spontaneous pneumothorax reviewed by Siebner had one of these pictures. To add further difficulty, four of the eight had had previous gastric symptoms. Many of them had little or no respiratory distress or marked chest findings. For the diagnosis we must look for a history of previous lung disease, an emphysematous chest with hyper-resonance, limited thoracic excursion, diminished breath sounds and fremitus, shift of the mediastinum, depression of the liver edge, elevated respiratory rate, shallow respiration and

dyspnea. Most of these may be absent. The temperature may be 103 degrees and the leucocyte count may reach 18,000. Demonstration that the abdominal findings are confined to the abdominal wall and a careful chest examination plus a roentgen examination will clarify the diagnosis.

Lobar pneumonia, especially if it is central and right-sided, may cause abdominal pain. From 5 to 10 per cent of adults with pneumonia have severe abdominal pain. The incidence is much higher in children, and we must remember that children do not always cough and rarely raise sputum even when they have the disease. Acute appendicitis is the abdominal lesion most often misdiagnosed in pneumonia. A respiratory rate of 40 or more, fever over 101 degrees and a leucocyte count over 30,000 point toward pneumonia. The onset is usually with a chill, a slight cough occurs on deep inspiration, and the pain is increased by the same. Movement of the alae nasae, an expiratory grunt, herpes or crusting on the lips, a red cheek with cyanosis, subcrepitant râles, diminished breath sounds and thoracic excursion may give the leads as to the diagnosis. The ratio of the pulse rate to the respiratory rate is changed from a normal of 4:1 to 2:1 or even 1½:1. This is a valuable aid but one often disregarded. Flexion and hyperextension of the psoas muscles do not aggravate the pain of pneumonia, and rectal examination gives negative findings. Again, we must show that the abdominal signs are confined to the abdominal wall. McClure has shown that in children with pneumonia, respirations are chiefly abdominal as in normal children, but in children with acute appendicitis, the respirations are chiefly thoracic. Tympanites and jaundice both occur in pneumonia due to anoxemia and toxemia of the intestinal musculature and of the hepatic cells. Their severity is a good guide to the prognosis of the case.

Acute pleuritis is another chest lesion which commonly gives abdominal pain, nausea and emesis. I have in mind a recent case of a boy who had repeated emesis and right abdominal pain. Luckily, there was no true abdominal rigidity and a few râles were heard over the right pleural gutter, indicating a diaphragmatic pleurisy. The pain as a rule is more intense during inspiration and is quite superficial. The pain also is apt to be in the hypochondrium rather than in the hypogastrium, and is usually also felt in the lumbar area. Many characteristics of lobar pneumonia apply here also.

Now, let us consider the traumatic lesions, fracture of the thoracic spine and fracture of the ribs. They are often incurred in such manners as to make the possibility of concomitant intra-abdominal lesions very great. Fracture of a thoracic vertebra almost always gives abdominal distension; and rib fractures, if posterior and severe, often give abdominal distension. It usually appears in 12 to 24 hours. The abdomen must be examined closely and frequently to be certain one has a simple paralytic ileus and no spreading dullness of a retroperitoneal hemorrhage or bleeding in the liver or spleen. The circulation also must be watched carefully to detect an internal hemorrhage. With the possibility of tympanites in mind, the attending physician should greatly restrict the diet of these patients from the onset.

With all this stress on the abdominal signs and symptoms of thoracic disease, let us not forget that a patient may have disease in both body cavities at one time. The records of Bellevue Hospital show an autopsied case which had both an acute coronary thrombosis and a perforated peptic ulcer, and there are reported cases of definite acute lobar pneumonia with coexistant acute appendicitis. However, our recent knowledge of pneumococcal peritonitis may explain the latter cases.

Hewat, of the Royal Infirmary of Edinburgh, has said, "The longer it takes one to make up his mind as to the diagnosis in any condition, the further he is away from an acute abdominal disease; the more likely it is to be found in the chest, be it acute or chronic."

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Juvenile Cirrhosis

A Case Report

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DURING the last 28 years over 79,000 students have been examined by the University of Wisconsin Student Health Department. Although an occasional student consults his home physician while in residence at the university, by far the greater number are seen and treated by the Student Health Department during any illness which may occur while registered in the university. Among this group of students, but one case of portal cirrhosis has been known to occur. This case has been of sufficient interest both from the standpoint of etiology and pathology to make us feel that it should be reported.

CASE REPORT

M. B., a white female 18 years of age, was admitted to the Student Infirmary September 23, 1937, with a chief complaint of swelling of her ankles. She had been fairly well until July, 1937, when she developed a rather marked anorexia. There was at first a loss of 10 pounds in weight, probably due to the anorexia. She stated that when she ate she felt uncomfortable because of abdominal distention. However, by September she noted a rapid gain together with some swelling of her ankles and an increase in the size of her abdomen. The ankles were fairly normal in size in the morning but by evening, particularly if she had been on her feet all day, they were so edematous that her friends remarked about it and insisted that she consult a physician.

The history by systems revealed that the patient had been subject to nosebleeds since she was 12 years of age. In addition to the recent anorexia and distention, she had noted a foul taste in her mouth. She stated that her urine had recently been darker in color than normal, and that it had been scanty. Her menstrual periods had never been regular. There was amenorrhea since June, 1937.

The past medical history revealed that this girl had tonsillitis at the age of 4 which was followed by a tonsillectomy. When she was 8 she had a mild attack of scarlet fever from which she had a complete recovery. At 10 she was in bed for several weeks because of a swelling of the inguinal glands, the exact nature of which was undetermined. At puberty she developed an acneiform eruption on her face associated with excessive pigment formation. Although she was apparently well, her mother consulted a physician when the girl was 16 because of the acne and an increase in the associated pigmentation. The patient was told she was anemic. No medicine was prescribed, although she was advised regarding her diet. For the past year her family had noted that she had a dusky complexion.

The social history was interesting in that this girl had carried a full academic course at the university in addition to outside work the previous year, and had made honors. There was no history of the use of drugs or of alcohol. The family history was not pertinent with the possible exception that a brother was admitted to the Student Infirmary at the same time because of vague abdominal symptoms consisting of distention, constipation, and some nausea.

The physical examination upon admission revealed a tall, rather thin girl, who was striking because of a peculiar brown pigmentation of her face which was associated with an acneiform eruption. Examination of the nose revealed some crusting of the mucous membranes with a small bleeding point on the left septum in Kiesselbach's area. The tonsils were well removed. The eyes appeared normal. There was good dental hygiene. Examination of the cardiovascular system revealed a blood pressure of 112/70, pulse 76, a faint apical systolic murmur heard only in recumbency and not transmitted, and A_2 greater than P_2. The venous pressure was normal. Examination of the chest showed impaired resonance and breath sounds from the eighth to the tenth ribs posteriorly on the right. There were no râles. The abdominal examination revealed the liver edge palpable one finger's breadth below the costal margin, and the tip of the spleen just palpable at the end of deep inspiration. Although there was no obvious abdominal distention and no fluid wave, the percussion note was dull in each flank. The pelvic and rectal examinations were normal. There was moderate edema of the ankles and some pretibial edema.

Laboratory examination at this time revealed a mild anemia with hemoglobin 70 per cent, red blood cells 4,000,000 and white blood cells 5,600 with 61 per cent neutrophiles. The urine had a specific gravity of 1.036, was acid in reaction, and there was 0.05 per cent albumin with the microscopic examination showing 3 white cells per high-power field. The blood chemistry showed an N.P.N. of 23 and blood sugar of 72 mgms. per 100 cc. The total proteins were 6.0 with albumin of 2.7, globulin of 3.3 and an albumin-globulin ratio of 0.8. The cholesterol was 152. Serology was negative. The Mantoux was negative. Kidney function tests showed a P.S.P. of 50 per cent the first hour and 50 per cent the second hour. The urea clearance was 65.5 per cent of the average normal standard, and the concentration dilution tests ranged from 1.020 to 1.004. Blood cultures were negative. X-rays of the chest and an orthodiagram revealed no changes in the heart or lungs.

With bed rest the edema of the legs subsided, but there was a rapid accumulation of ascitic fluid so that on October 14th an abdominal paracentesis was necessary. 3,700 cc. of clear yellow fluid were removed with considerable relief to the patient. This fluid had a specific gravity of 1.009, albumin 0.8 per cent, 2 red blood cells per high-power field and 2 white blood cells per high-power field. There was a persistent anorexia and a heavily coated tongue. On October 16th the patient began to expectorate small amounts of blood-tinged sputum. On October 29th she complained of a pain in the lower right chest. At this time there was marked abdominal distention and a mild icterus was first noted. An icteric index was 75. On November 3rd, 5,000 cc. of clear ascitic fluid were removed. From that time on there was constant oozing at the site of the paracentesis so the ascitic fluid did not accumulate so rapidly.

This patient failed rapidly after the 1st of November. She developed attacks of severe abdominal pain, cramp-like in character and relieved by morphine. The anorexia persisted together with occasional vomiting. The icterus became less marked. The dullness at the right base of the chest disappeared. She developed a hyperchromic anemia with hemoglobin of 12 grams and red blood cells 2,832,500. The white blood count rose to as high as 22,000 with 80 per cent neutrophiles. She had an occasional febrile reaction of 99.2 to 100°.

On November 17th the patient had an uncomfortable day because of nausea and vomiting. Also, there was some coughing although the chest was clear to physical examination. On the morning of the 18th she was quite apprehensive. Her pulse was weak, her extremities were cold and cyanotic. She asked for a drink of water. After two swallows she complained of severe abdominal pain, groaned and then became tense. This lasted for about 20 seconds, when she suddenly relaxed, took several deep breaths and then stopped breathing.

An autopsy performed by Dr. John McCarter revealed the following findings: The gross examination showed a fine blotchy brownish pigmentation of the skin over the face and neck. The heart weighed 250 grams. There were no gross valvular lesions. The cardiac muscle was rather pale with a few scattered minute areas of hemorrhage. The lungs showed some edema and there were numerous small patches of hem-

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orrhage. The peritoneal cavity contained 3,000 cc. of slightly cloudy yellow fluid; the peritoneal surfaces were smooth and glistening. The liver was small, weighing 970 grams, and the entire surface was both yellow and nodular. The organ cut with increased resistance. The cut surface was granular and fibrous with distortion of the lobular markings. The gallbladder was rather large and moderately distended with greenish bile. The main ducts were patent. The wall and mucosa appeared normal. The pancreas was rather large and firm to palpation. The cut surface appeared fibrous. The adrenals showed no gross lesions. The kidneys appeared fairly normal. The alimentary tract revealed a number of esophageal varices extending into the cardia. The small intestine appeared normal to gross examination but the wall of the colon was edematous. The pelvic organs were normal in appearance.

The microscopic examination was reported as follows: *Heart*: Recent small epicardial hemorrhages; atrophy; parenchymatous and vacuolar degeneration of fibers; small recent myocardial hemorrhages and areas of autolysis; some coronary sclerosis and perivascular fibrosis. *Lung*: Recent small hemorrhages about hilum and in parenchyma; some edema; congestion. *Spleen*: Acute and chronic congestion; hypertrophic corpuscles; some corpuscles show toxic fragmentation of nuclei and polymorphonuclear infiltration. *Liver*: Much chronic hepatitis; diffuse fibrosis, especially about portal spaces; some duct regeneration; some large nodules of liver regeneration; an acute yellow atrophy with cirrhosis and progressive damage. *Gallbladder*: Edema of wall; some atrophy of mucosa. *Pancreas*: Interacinar fibrosis; heavy edema of stroma. *Stomach*: Chronic atrophic gastritis. *Colon*: Extreme edema with sparse acute cellular exudate in submucosa and mucosa; acute colitis. *Appendix*: Submucosal fibrosis and lipomatosis. *Celiac lymph nodes*: Acute lymphadenitis. *Adrenal*: Much lipoid; some cortical hyperplasia. *Kidney*: Congestion; parenchymatous degeneration; fatty degeneration of convoluted tubules and descending limbs of Henle, some recently regenerated convoluted tubules. *Bladder*: Edema of submucosa. *Ovary*: Active, small simple cysts. *Uterus*: Atrophic mucosa with some follicle influence. *Aorta*: No lesion.

Bacteriological studies made by Dr. Frances E. Holford revealed gram-negative rods to direct smear from the liver. Cultures showed B. coli. Also, cultures of the bile showed B. coli. Cultures of the gallbladder mucosa and wall showed B. coli and Streptococcus viridans. Blood cultures were negative.

Toxicological studies made by Dr. F. L. Kozelka were negative for arsenic, mercury and lead, but the kidney contained 20 mg. of copper per 100 Gms. of tissue and the liver contained 33.2 mg. of copper per 100 Gms. of tissue.

The final diagnosis was: Acute yellow atrophy with cirrhosis (portal); progressive toxic necrosis; vacuolar degeneration of the myocardium; toxic degeneration of splenic corpuscles; edema of pancreatic stroma; acute colitis; fatty degeneration of kidney. Toxicological studies indicated copper poisoning and bacteriological examination indicated B. coli infection of the liver.

Discussion

There are several details of special interest in this case. Although this patient had been told she was anemic two years before the fatal illness, she had been unusually well the year prior to death. She was working until September, 1937. From that time on there was a rapid development of ascites and finally death (November, 1937), which illustrates what has been so frequently described, the rapid course of cirrhosis in the child or young adult. The case reveals how the hypochromic anemia noted upon admission developed into a hyperchromic anemia before death. This, together with the reversed albumin-globulin ratio, was evidence to the fact that there was liver damage.

The etiology in this case is undetermined. The patient had used no drugs and there had never been exposure to alcohol. There was no history of recent infection. The only facts in her history which suggested that she might have had trouble earlier were the reported anemia (no blood studies were made), the frequent epistaxis, and the increase in the brown discoloration of the skin. Her brother was ill with vague gastro-intestinal symptoms while the patient was in the Student Infirmary. For that reason is seemed worth while to have a chemical analysis of the patient's liver and kidneys at the time of the autopsy, with the possibility in mind that the girl and her brother might have had exposure to some heavy metal. Dr. F. L. Kozelka, Wisconsin State Toxicologist, made the necessary analyses. His report of 20 mg. of copper per 100 Gms. of kidney and 33.2 mg. of copper per 100 Gms. of liver was considered to show copper definitely above the normal.

There is still debate as to the relationship between portal cirrhosis and copper intoxication. Pathological changes similar to hemochromatosis have been produced in rabbits by chronic poisoning with copper salts. Mallory and his co-workers suggested that there might be an analagous cause for hemochromatosis and alcoholic cirrhosis because of the frequent association of the two.[1,2] Flinn and his associates studied the effects of copper on the liver and came to the conclusion that copper and its compounds do not cause cirrhosis.[3] In the case here reported, there was no known source of exposure to excessive copper from the time of birth to death. The viscerae showed a higher copper content than is normal, although series of cirrhosis cases studied elsewhere have shown an increase in the liver copper content.[4,5,6] The question that arises is whether a diseased liver such as this patient had is capable of utilizing the amount of copper to which a normal individual is exposed. It would seem that the question of copper and its relation to cirrhosis is still unsolved and that further cases of cirrhosis should be studied from this standpoint.

This case illustrates the rôle of infection in cirrhosis and makes one feel, as others have suggested, that the etiology of cirrhosis is a combination of factors together with infection rather than a specific factor.[7,8]

Summary

A case of juvenile cirrhosis is reported with autopsy findings and chemical analysis of the liver and kidneys. The relationship between an increased copper content of the liver and cirrhosis is discussed.

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The Importance of Adequate Scrotal Support*

Preliminary Report

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THE value of providing support for the scrotum has been recognized by medical practitioners, but the medical literature rarely mentions this subject. Teachers of urology recommend the use of suspensories during the treatment of various pathologic changes involving the scrotum, testicles and other parts of the genital tract, although the employment of such therapy has almost entirely been on an empirical basis. Any discussion of the therapeutic value of this supplementary "splinting" or reinforcement of the scrotal wall must deal with the manner in which the scrotum and its contents are influenced by its anatomic position and structure.

In this study, it was possible to see the effects of postoperative use of suspensories in a controlled series of patients kept under continuous observation following scrotal surgery in a tuberculosis hospital. The beneficial results were noted and are reported here, but more detailed experimental and surgical inquiries will be necessary to evaluate the importance of satisfactory support (1) in the protection of the scrotum and testicles and (2) in aiding the circulation in these tissues. Consideration of this problem requires a review of the ontogenetic and phylogenetic development of the male genitalia and many interesting features are presented in a functional, embryologic, and comparative anatomic survey of the external genital organs.

Structural Considerations

The scrotum is a loose sac containing the testicles and lower portions of the spermatic cords, and is situated below the symphysis pubis and between the anterior portions of the thighs. It is unprotected anteriorly, and is exposed posteriorly to repeated blows from the thighs. The skin is thin, semi-transparent, and easily distensible, having a wrinkled appearance when the dartos muscle layer is contracted. The dartos is a thin involuntary muscle, densely adherent to the skin, and gives off strands to form the scrotal septum which bisects the scrotum into its left and right portions. It is continuous with Colles fascia. The sub-dartos connective tissue or intercolumnar fascia from the external oblique muscle, loosely envelops the testicle. Anatomically, the scrotum acts mainly as a receptacle, and the testicles, therefore, require additional support by other structures.

The cremasteric muscle, a continuation of the internal oblique muscle, partially envelops the testicle and spermatic cord to furnish most of the support for the testicle. It is attached to the parietal layer of the tunica vaginalis which forms an internal covering. The visceral layer of the tunica vaginalis has a large well lubricated surface in order to protect the testicle in its continual movement. The thick tunica albuginea also serves the testicle as a protective covering. With increasing age and following disease, the dartos and the cremasteric muscles lose their tonicity, and the testicles hang very loosely in the pendulous, poorly-contractile scrotum. The other spermatic cord structures, the vas deferens, blood vessels, nerves, and fascial elements are extremely relaxed and furnish no additional support. The scrotal blood supply enters along the lateral and superior edges. The testicular blood supply comes through the spermatic cord, most of it being carried by the internal spermatic artery, and supplemented by a minimal collateral circulation furnished by the external spermatic artery from the inferior epigastric. There is a free anastomosis between the internal spermatic artery and the artery of the vas deferens.

The veins, after leaving the testicle, are joined by those from the globus major of the epididymis to ascend the spermatic cord as the pampiniform plexus. Most of the plexus is in the anterior portion of the cord, adjacent to the internal spermatic artery, and a smaller portion accompanies the vas deferens to form a posterior group. The veins unite to form the spermatic vein at the internal abdominal ring. The lymphatics of the testicle and cord follow the spermatic vessels and drain into the external iliac or lumbar nodes along the aorta and vena cava. The external spermatic (genital) branch of the genitofemoral nerve accompanies the internal spermatic artery.

Because of their route through the inguinal canal, the blood vessels are affected not only by the usual vascular changes. Although valves have been reported in each spermatic vein at its origin and termination, the mechanism of venous return in the testicle and pampiniform plexus must depend on external pressure from the scrotal skin, dartos, and the thin cremasteric fibers. When these fail, the scrotum and its contents are especially prone to venous stasis as a result of (1) the dependent position of the human testicles and the tortuosity of the route of venous return and (2) the factor of insufficient musculature of the cord. The veins of the testicle and cord, therefore, have a marked tendency to become varicose.

Embryology

Originally, the scrotum develops from the two labioscrotal folds, one on each side of the median furrow, cranial to the phallus. These migrate caudally and unite distal to the phallus, the line of fusion at the median raphe. With assumption of the upright position and during growth, associated with increased laxity of the infantile scrotum, it further tends to assume its more caudal adult position.

The migration of the human testicle occurs from its retro-peritoneal para-renal station to its scrotal habitat,

*From the urologic services of Drs. A. J. and M. E. Greenberger, Sea View Hospital, Staten Island, New York.

pushing a fold of peritoneum ahead of it. At its exit through the abdominal ring, the peritoneal fold becomes pinched off and its portion along the spermatic cord atrophies, while that part attached to the testicle remains as the tunica vaginalis. Although an active force causing this migration is not known, one must include a combination of factors, such as (1) relative shortening of the gubernaculum between the floor of the scrotum and the testicle, (2) increased growth and straightening of the body while the testicle is held by the gubernaculum, and (3) definite active descent, possibly on a hormonal basis.

A repetition of the phylogenetic course is seen in the migration of the testicles and the labioscrotal folds.

Comparative Anatomy

The erect posture of the human has been blamed for many of the ailments to which he is subject. Various orthopedic and gynecologic disturbances which are attributed to the upright position appear to have a counterpart due to the unsatisfactory situation of the scrotal contents, amenable to relief by scrotal support.

The study of the comparative anatomy of the scrotum and its contents reveals that these structures have less adequate protection in the human. The variations in position of the testicle in the vertebrates allow formation of many theories as to any functional and anatomical relationship. The gland maintains its upper-abdominal status up through the fish, birds, and reptiles. The hyrax, a more primitive quadruped, similarly has abdominal testicles. Still higher in the phylogenetic scale, in the seal, armadillo, whale, elephant and camel, it has maintained an intra-abdominal or inguinal position. In most rodents and bats, it lies in the groin, in some descending into a scrotal sac only during the mating season. In quadrupeds, the scrotum is adequately protected, while in bipeds it is exposed to constant trauma. When the quadrupeds have scrotal testicles, they are located inferior to the body, and are better protected against blows from all directions.

Function

In discussing the migration of the testicle, Hinman states, "Nature's purpose cannot have been better protection." The thermoregulatory function of the scrotum following testicular descent has been studied extensively, and its external position has been found to be of vital functional importance in both human beings and in many animals. Wangensteen, Moore, and others have discussed the necessity of having scrotally placed testicles for continuance of normal spermatogenesis. Hanes and Hooker have shown that the complete descent of the testicles is necessary for production of a normal amount of the male sex hormone. However, some animals have normally functioning intra-abdominal and even pararenal testicles. In these, Krainer proved the temperature of the testicle is lower than that of the general abdominal cavity.

Traumatism

As a result of experience of its susceptibility to injury, the scrotum has been carefully guarded in supervised athletics, where the necessity for protection with either elastic or metal supporters has been recognized. Continual trauma may be the cause of occasional tiny areas of atrophic tubules frequently found in normal testicles which are recognized as a common finding by histologists. Although the effect on spermatogenesis of these minor traumata is not known, atrophy of the testicle has been produced both operatively and experimentally. In a study following experimental trauma to testicles in animals, Terrilon and Suchard proved that atrophy of portions of the testicle could be produced.

The importance of proper postoperative scrotal support and protection has been emphasized by Bisher. He states that it aids the circulation of testicles at the time when it is most needed, and cites twenty-two instances of unilateral testicular atrophy following operations.

Zuckschwerdt and Zettel have reported four occurrences of bilateral testicular atrophy in a series of 204 Bassini operations for inguinal hernia in children.

Bisher suggests the postoperative use of a suspensory to prevent the venous congestion due to the dependent position of the scrotum. He gives a topographic classification of the operations usually producing trauma of the testicle or interference with its blood supply:

1. Scrotal: hydrocele, varicocele, vasostomy, vasectomy, epididymectomy, epididymotomy, epididymovasoneostomy.
2. Abdomino-inguinal: hernia, suprapubic cystostomy, prostatectomy, lumbar ureterostomy, inguinal exposure for vasectomy, varicocele, or hydrocele.
3. Perineal: external urethrotomy, prostatectomy, vesiculectomy.
4. Transurethral: prostatic resection, cystoscopy, sounding, catheterization.

To this group of procedures, it is advisable to add the injection treatment of hernia, where the use of suspensories is an important adjunct. Working in Rice's clinic, we noted successful and uncomplicated end results of numerous hernia injections. Rice eliminated the objection that the procedure caused damage to the contents of the inguinal canal. Whenever there is any evidence of scrotal venous stasis causing edema, the use of a scrotal support relieves symptoms and has been followed by no apparent clinical evidence of testicular atrophy or sterility. Such edema may occur late during the course of injections, probably due to inflammation around the closing hernia rings. A scrotal support supplements the forces regulating venous return from the scrotum and testicles.

Postoperatively, the value of the suspensory lies in protecting the testicle, preventing trauma and aiding in reducing congestion of the scrotum and its contents. In this manner, it will aid healing of the scrotum and testicles with a minimum of possible atrophy.

Postoperative Studies

Scrotal suspensories were applied to a series of ten patients following epididymectomy for tuberculosis during 1938. Three of these patients had had previous epididymectomies, and two had had orchidectomies for tuberculous disease on the opposite side, providing ex-

cellent cases for review of the influence of suspensories on the patients' symptoms. A similar group of patients were treated with the usual gauze-adhesive tape dressings and scrotal bridges postoperatively. Although this is a small series, it was observed that in addition to the ease of maintaining dressings in place in the former group, there were less complaints of pain in the operative regions after the patients became ambulatory. Among those who developed sinuses or had had preoperative tuberculous tracts, healing was more rapid when a scrotal suspensory was applied. The patients who had previous scrotal surgery noted less discomfort during the present postoperative course. Since both groups of patients were on the same urologic wards and discussed each other's cases freely, the palliative and therapeutic value of scrotal suspensories became so apparent to them that it was impossible to withhold suspensories from patients with scrotal tuberculosis.

The occurrence of tuberculous meningitis and miliary tuberculosis at Sea View Hospital has been found frequently associated with an untreated tuberculous epididymitis, possibly due to a spread resulting from trauma to the exposed tuberculous epididymis. Therefore, suspensories have been used as a protective measure by Greenberger and the writer in patients with tuberculosis of the epididymides where operation cannot be performed or must be postponed.

SUMMARY

1. Various structural peculiarities of the normal scrotum emphasize the inadequate architecture in the human.

2. Lack of adequate protection and a dependent position indicate the value of scrotal support to prevent or minimize trauma and as an aid to circulation.

3. Atrophy, either secondary to surgery or other circulatory disturbances, or due to direct trauma, may occur unilaterally or bilaterally.

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A New Type of Calcaneal Spur*

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THE object of this paper is to discuss a type of spur formation on the posterior aspect of the os calcis which to my knowledge has not been described before. An exhaustive review of the literature was not made, however, and it is possible that this is not a new entity. Since no references to such a condition have recently been seen in our American litrature or books, it probably is not a common disease. For this reason if for no other, a description of it is in order.

Gray, in his textbook on Anatomy, states that: "The posterior upper aspect of the os calcis is normally smooth and is covered by a bursa which separates the Achilles tendon from the bone." My examination of many X-rays of the os calcis also revealed a smooth posterior surface of the os calcis just under the bursa separating the Achilles tendon from the os calcis. X-ray examinations in this condition, however, are not to be completely relied upon as small irregularities and spurs may not be visible. Therefore, it is possible that tiny spurs were present and were not detected by the X-ray.

These spurs on the posterior superior aspect of the os calcis were found at operation upon two patients suffering from an Achilles bursitis. The clinical findings were those of an Achilles bursitis consisting of swelling, aching, tenderness, and increased local temperature. Pressure of the shoe produced discomfort and walking was painful, especially climbing upward. Conservative treatment consisting of rest, immobilization and physiotherapy proved unsuccessful and so after several weeks, operative removal of the bursae was done. Upon operation, we found enlarged edematous bursae as was ex-

*Read before the Cascade County Medical Society March 28, 1939.

pected but after their removal, spur formations which were small, rough and sharp, were found on the posterior superior aspect of the os calcis. These protruded as much posteriorly as superiorly. Obviously they constituted a rough surface over which the tendon had to slide and which probably caused the bursitis. Whether the spur or the bursitis came first, I do not know.

Case Reports

Case 1. F. S., a lumber-jack, aged 27, came in on Feb. 6, 1937, complaining of a sore heel which began suddenly 18 months ago. He had aching in the region of the insertion of the Achilles tendon, and intermittent swelling. The pain, too, was intermittent. His symptoms were aggravated by walking and especially upon climbing hills. He obtained relief from rest. The other foot began to give him the same trouble 6 months ago. He had seen various doctors who told him he had inflamed tendons.

His past history was irrelevant. Upon examination, he was found to have enlargement of the posterior aspect of both heels in the region of the insertion of the Achilles tendons. There was swelling also to either side of the tendons in the region of the Achilles bursae, which were doughy and quite tender. There was no fluctuation present and there was no tenderness over the calves or upper Achilles tendons. No crepitation was present upon motion. The gait was abnormal in that he did not step off the forefeet normally but walked in a shuffling manner. The X-ray revealed no bony abnormality. The diagnosis made was "Chronic Achilles Bursitis."

Plaster casts and bed rest were advised and carried out. Three weeks later, the heels were very much improved, the left one being almost normal and the right one being thickened but not very tender. He was advised to wear larger shoes, to walk sparingly and to avoid climbing. Physiotherapy was advised. On March 12, 1937, some swelling, tenderness and fullness persisted about the Achilles insertions. There also was some fullness and tenderness over the insertion of the plantar fascia into the os calcis. His shoes were still too short and he was advised to discard them. On April 6, 1937, the swelling persisted but was not so tender. The plantar fascia was still tender at its insertion. He was advised to have the bursae removed which was done April 10, 1937. Upon operation, thickened bursae were found containing a few drops of clear fluid. These were dissected out. Upon the posterior superior aspect of the os calces were found rough edges which appeared like a ridge of small spurs. These protruded both upward and posteriorly. Passive motion of the ankles did not definitely cause friction of the spurs upon the Achilles tendons and so they were not removed. The pathological report was "Chronic Bursitis."

Convalescence was uneventful but very slow in spite of care to avoid overuse of the feet and to avoid climbing. His symptoms disappeared but the enlargement persisted. Several months later the same was true. There was no longer any redness, tenderness or increased local temperature. The enlargement was firm and not doughy as before operation. More than one year after operation, the situation did not change. The patient was working again and was well satisfied with the result in spite of the thickened heels. He walked uphill two miles every day without further symptoms.

Case 2. W. B., a rancher, age 31, came in August 17, 1937, complaining of foot trouble. Ten years ago a horse fell on his right ankle but he had no great trouble until recently following a hunting trip in which he walked a great deal, both on the level and climbing hills and mountains. He developed pain in the Achilles tendon which was followed later by swelling and redness. He obtained relief with rest but only temporarily. A physician gave him medicine and advised new shoes but neither of these gave him relief.

Upon examination of the foot there was swelling of the heel about the Achilles bursa on both sides of the tendon and tenderness but no evidence of inflammation. No crepitation or friction rubs were present. The bone itself was not tender. There was some tenderness over the medial calcaneal tubercle. X-rays were negative for bony pathology. A diagnosis of Achilles bursitis was made and a plaster boot applied with a walking caliper. In one month the cast was removed, at which time the swelling was markedly reduced and the pain gone. A felt pad was cemented into the back of the shoe in back of the Achilles tendon and above the location of the bursa to prevent further pressure and the heel was raised one-fourth inch. On December 7, 1937, his pain was again present and also local tenderness but no swelling. Operative removal of the bursa was advised and executed on December 8, 1937. Upon operation, a thickened mass of fibrous and fatty tissue was removed where the bursa should have been. On the posterior superior edge of the os calcis, there were two or three small, rough, sharp spurs present about one-sixteenth inch high. These were chiseled off, the raw bone tamped smooth and closure made in layers. The pathological report was "chronic bursitis." The spurs were not sectioned. Convalescence was normal. Several weeks later, I received a letter from the patient which said that the foot was better than before operation but that some pain was still present in the heel. He then left the state and has not been heard from since; therefore, the ultimate result is not known.

Summary

Spur formations can occur on the posterior superior aspect of the os calcis under the Achilles bursa and may not be visible upon roentgenological examination. The patient can get well without their removal as illustrated by the first case in whom the heels remained thickened posteriorly but were symptom-free two years after operation. When the spur was removed, the ultimate result is unknown.

Whether the spur formation was a complication of the bursitis or vice versa is not known. It is reasonable to suppose, however, that the spurs preceded and caused the bursitis.

The Tuberculosis Problem in Negro Schools and Colleges*

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THE tuberculosis death rate for Negroes of all ages in the United States is, as has often been stated, from two to three times that of the white population. This disparity varies greatly in different communities and age groups. In the District of Columbia this is 6 to 1; while in Baltimore and New York City it is 5 to 1. This inequality is greatest, however, when we consider the younger age groups. According to Whitney[1] in 1930, the rate for the male Negro between the ages of 15 and 19 was 7.1 times that of the white in the same group while the ratio of colored to white death rates in young women 10 to 14 years of age was 8.6 to 1. The figures for the Metropolitan Life Insurance Company[2] for the period 1931 to 1935 also emphasize this disproportion. In addition, the statistics of this company show another very interesting fact. In the period 1911-1915, the average tuberculosis mortality rate for white males between the ages of 15 to 19 was 124.3 and for white females 152.0; on the other hand, the rates for Negroes were 429.0 and 592.6 respectively, thus giving a ratio of about 4 to 1. However, twenty years later during the period 1931-35, this divergence instead of decreasing had increased to about 9 to 1 for the males and 7 to 1 for the females; the figures here being 18.9 and 38.1 for white males and females respectively and 170.0 and 281.8 for the Negroes. Thus, it is seen that there is necessity for continuous vigilance in the ages of adolescence and youth.

The college is now recognized as a strategic place for attack on this disease. First, because it contains the age group most vulnerable to the ravages of this plague, and second because college graduates are the future leaders in the community. It is said that less than 1 per cent of the population of the United States is composed of college graduates, and yet more than 50 per cent of the positions of influence are occupied by college men and women.[3] In this country there are approximately 111 Negro colleges located in 19 states and the District of Columbia. With the exception of five or six institutions all are located in the South. The majority of these colleges as shown in Table 1[4] are small with an enrollment of less than 500 students and three-fourths of them are privately owned.

TABLE 1
Enrollment in Negro Colleges

No. of Students	Public	Private	Total
500 or more	7	3	10
250 to 500	12	18	30
100 to 250	13	27	40
Less than 100	4	27	31
	36	75	111

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*Presented at the annual meeting of the Southern Tuberculosis Conference, September, 1938.

The total attendance at these schools has gradually increased so that at present approximately 30,000 students are enrolled in Negro institutions of higher learning for two to four or five years. In this connection, it is interesting to note that of the 111 institutions 69 still carry secondary schools with a total enrollment of 8,033.[4] Thus it is seen that here we have a group whose health reaction-patterns and ideals are of great significance not only to the race but to the country as a whole. It is therefore of some importance to know first, the extent of tuberculosis case-finding programs in Negro colleges; second, the tuberculosis problem in these institutions; and third, the measures which may be developed toward their solution.

The Extent of Tuberculosis Case-finding Programs in Negro Colleges

Adequate tuberculosis case-finding programs are not found extensively in our Negro colleges. In a recent article,[5] the author found that during the period 1933-36, of 35 institutions with an enrollment of 14,162, only 11 had done tuberculin testing on entering students for three consecutive years: two for two years, while three began this practice during the school year 1936-37. The other five had done the tests irregularly or only in suspicious cases. Of the eleven schools, eight stated that X-rays of positive reactors were taken.

The dearth of this type of activity was further noted when we had occasion to make personal visits to 25 colleges with a total attendance of 12,000 students and located in six Southern states. Only five of these with an enrollment of 2151 individuals were doing tuberculin testing and X-ray of positive reactors; one did the tuberculin test but no further examinations of the reactors and another only X-rayed its entering students without any previous screening procedure. It is obvious, therefore, that the accepted tuberculosis case-finding procedure is not practiced to any great extent in Negro schools.

Tuberculosis Infection in Negro Colleges

The incidence of tuberculosis infection in the 30,000 Negro college students is obviously difficult to estimate. However, certain available data offer a suggestion as to the prevalence of tuberculosis exposure among this group. In the questionnaire study[5] mentioned above, fifteen schools stated, as shown in Table 2, that during the period 1933-36, 3,542 of their students had been tested. The percentage of positive reactors in this group was 33.9. It was also observed in this investigation that the lowest percentage reported was 25.0 while the highest was 63.6.

TABLE 2
Total Results of Tuberculin-testing in Negro Colleges, 1933-36

School Year	Schools Reporting Program	Number Tested	Per Cent Positive
1933-34			
1934-35	2	309	26.9
1935-36	5	1599	27.6
1936-37	8	1634	41.4
Total	15	3542	33.9

In the summer of 1935, the National Tuberculosis Association made available P. P. D. free of charge to those Negro colleges and Universities which were willing to carry out complete tests and send their results to the Association for compilation. Eight Negro colleges located in Georgia, Arkansas, Mississippi, Ohio, West Virginia, Maryland and Virginia took advantage of this offer. Miss Jessamine Whitney of the National Tuberculosis Association kindly sent us the analysis and tabulation of the results of the 2040 students tested. For all ages the percentage of positive reactors was 39.1. As would be expected, reactors gradually increased with age. A marked difference between the two sexes was also noted. For all ages, the percentage of positive reactors was 44.0 for the male and 35.4 for the female, a difference of approximately 10 per cent. This was true for practically every age. This disparity between the sexes, although already noted in white students,[6,7] has not been found to be as great as in this group of Negro students.

For several years, the Extension Department of the North Carolina Sanatorium has been actively engaged in tuberculosis case-finding in both Negro and white colleges in the state. Last year, Dr. P. P. McCain[8] reported the results of this work to the American Sanatorium Association. As seen in Table 3, 9,149 college students, of whom 2,538 were Negroes, were tested intracutaneously with 0.1 mgm. of old tuberculin. The performance and interpretation of the test, unlike the other two surveys, were made by experienced clinic physicians from the Sanatorium. The per cent of positive reactors for the Negroes was 48.0 while for the whites, the figure was 31.0.

TABLE 3
Report of Tuberculin Tests of 9,149 North Carolina College Students (0.1 mgm. Old Tuberculin Intracutaneously)

	Number Tested	Number Reactors	Percentages of Reactors
White	6,611	2,071	31.02
Colored	2,538	1,119	48.02
Total	9,149	3,190	34.80

The last survey to be considered at this time is the one at Howard University. This past school year, through a grant made by the District Tuberculosis Association, it was possible to begin, for the first time, a tuberculosis case-finding program for the whole University. The program was developed and supervised by Dr. Howard M. Payne, who also has charge of one of the tuberculosis clinics of the Health Department. The program was instituted as a year-round project along four lines, viz.:

1. To tuberculin test and X-ray the reactors in the freshman classes;
2. To X-ray the second, third, and fourth year classes of the Medical School en masse, without any previous tuberculin tests;
3. To study carefully all students with symptoms suggestive of tuberculosis or who complained of unusual respiratory episodes;
4. To educate students to the importance of the tuberculin test and X-ray as part of their periodic or routine physical examination.

Although the results of this survey have not been completely analyzed, certain preliminary figures are of interest. Four hundred eighty-five students, most of whom were freshmen and under 25 years of age, were tuberculin tested. Of this group, 314 or 64.2 per cent were positive. Of the 246 males, 179 or 72.2 per cent were positive; while of the 239 females, 135 or 56.4 per cent fell into this category.

TABLE 4
Results of Tuberculin Testing with P. P. D. of Howard University Students, 1937-1938

	Number Tested	Number Reactors	Percentage of Reactors
Total	485	314	64.2
Male	246	179	72.2
Female	239	135	56.4

Here again, as already noted, we find a sizeable divergence between the percentages of male and female reactors.

The incidence of positive reactors in Negro colleges would appear to vary greatly on the basis of these four surveys. However, when these are compared with data for white colleges, an explanation is possible. Accumulation of data from various white universities has shown that relatively high rate (from 40 to 60 per cent) are found in the colleges in the East and Far West;[6] lower rates (30 to 40 per cent) in the Southern colleges;[7,8] and the lowest (20 to 30 per cent) in the schools located in the Central States.[6] Negro colleges are located in the South, and thus, excluding momentarily the results at Howard University, when we compare the percentages of the other three surveys with the figures from Southern white colleges, it is found that the incidence of tuberculous infection is just a bit higher in the Negro institutions. However, the difference is not as marked as would be expected in view of the higher morbidity and mortality in this race. The high percentage for Howard University may be explained on the basis that this school attracts its students for the most part from the large populated centers of the North and South, rather than from the rural areas, and therefore, it is comparable not with the Southern white colleges, but rather, with the white universities of the East and Far West. And thus, here again it is seen that there is not a great inequality in the percentages.

The small difference in positive reactors between white and Negro college students has been said to be due to

TABLE 5
Results of X-Ray Survey of Three Colleges in the District of Columbia (W.P.A. Project, 1935)

School	Total	Normal Chest		Active Tuberculosis		Suspected Tuberculosis		Chest Abnormalities Other Than Tuberculosis	
		No.	Perc.	No.	Perc.	No.	Perc.	No.	Perc.
All Schools	1725	1682	96.9	13	0.7	21	1.2	9	0.5
Miner Teacher's College	423	416	98.3	3	0.7	1	0.2	3	0.7
Wilson Teacher's College	389	367	94.3	2	0.5	19	4.8	1	0.2
Howard University	913	899	98.4	2	0.2	1	0.1	5	0.5

TABLE 6
Result of X-Ray Study of 2,779 Positive North Carolina Student Reactors

	Number Having X-Rays	Adult Type Tuberculosis			Childhood Type Tuberculosis		
		Number	Perc. of Number Tested	Perc. of Number X-Rayed	Number	Perc. of Number Tested	Perc. of Number X-Rayed
White	1799	42	0.63	2.6	216	3.2	13.8
Negroes	980	22	0.86	2.2	93	3.6	9.4
Total	2779	64	0.69	2.5	309	3.3	12.1

the fact that Negroes in colleges come from homes where the environmental, social, economic and educational advantages are the best. This, however, does not seem to be the proper explanation.

This same small difference in percentages has been found in grammar schools where there is less selectivity.[8] It has also been noted in the general population as shown by Whitney & McCaffrey.[9] In our opinion, no explanation can be given at the present time. It must be remembered that the number of individuals who have been tuberculin tested is still small. Many factors must be investigated before an adequate explanation can be given.

Tuberculosis Disease in Negro Colleges

The question which may now be considered is the extent of tuberculosis disease in Negro colleges. Here again it is difficult to actually give a complete picture of this situation, since there are very few institutions which are carrying out adequate case-finding programs. However, the consideration of certain available data may give us a basis for an intelligent discussion.

During the fall of 1935, through a Works Progress Administration Project, students at two Negro institutions: Howard University and Miner Teachers College, and one white institution: Wilson Teachers College, were X-rayed. The films were taken by the Powers X-Ray Company, at no charge to the individual. The students were not compelled to take this examination, rather, they did so of their own volition. In Table 5, it is noted that of 913 students at Howard University, only two, or .2 per cent, were found to have active tuberculosis as compared to .5 per cent for Wilson Teachers College. Even when Miner Teachers College and Wilson Teachers College are compared—these two being more comparable because both are training schools for teachers—it is found that although the percentage is higher for the Negro institution, the difference of .2 per cent is not statistically significant. Even when the percentages of suspected tuberculosis cases are compared, it is found that the figure of 4.8 per cent for the white institution is much higher than the figures of .2 per cent and .1 per cent for the Negro schools.

The second X-ray survey to be mentioned is that of McCain[8] in North Carolina. This study has already been previously cited. In Table VI the result of the X-ray of 2,779 positive North Carolina student reactors of whom 980 were Negroes is shown. It is noted that of the 1,799 white students X-rayed, 2.6 per cent showed adult type tuberculosis while for the Negro students, the percentage was 2.2. Even the per cent of childhood type of tuberculosis is higher in the whites than in the Negroes, the figures being 13.8 and 9.4, respectively. Thus, here again it would appear that tuberculosis disease is not much more prevalent in the Negro than in the white colleges.

This appears to be substantiated by our preliminary data from Howard University. For the school year 1937-38, 420 individuals were X-rayed. This group included 314 positive reactors and 106 students on whom no tuberculin tests were done. In Table 7, the results are shown. It is noted that 29 individuals or 6.9 per cent of those X-rayed had roentgenologically demonstrable tuberculosis infiltration in the lungs. It is to be emphasized that 25 of these cases were in the minimal and latent stages. At first it would appear that the figure 6.9 per cent is exceedingly high for a college group, but it must be remembered that white colleges have reported figures almost as high. Stiehm[10] at Wisconsin, for instance, reported that of 579 students X-rayed, 5 per cent of the positive reactors had adult type of tuberculosis infiltration. In addition, two factors must be taken

TABLE 7
Result of X-Ray Study of Howard University Students 1937-1938

Total Number of Individuals Examined 591
Total Number of Individuals X-Rayed 420

Type of Lesion	No.	Percent of No. X-Rayed	Percent of No. Examined
Miliary Tuberculosis	1	0.2	0.2
Moderately Advanced Tuberculosis	3	0.7	0.5
Minimal Tuberculosis	9	2.1	1.5
Latent Apical Tuberculosis of Minimal Extent	16	3.8	2.7
Total X-Ray Demonstrable Tuberculosis Infiltration	29	6.9	4.9

into consideration: In the first place, the survey at Howard, unlike the other two, was carried throughout the year, and thus all suspicious and doubtful cases whether freshmen or upperclassmen could be followed. Secondly, included in this group were 67 individuals in the upper medical classes in whom tuberculosis findings are much more common.

Thus, when the figures for Howard University are compared with those of a more similar group such as that of Hetherington, McPhedran and Opie[11] they are not found to be unusually high, as would at first appear. In the Hetherington group, 279 college students and 452 medical students were X-rayed. Of the college individuals, 3.9 per cent had roentgenologically demonstrable lesions. In the medical group, on the other hand, 13.5 showed demonstrable lesions. Thus, when the whole group; namely, the college and medical students, is considered, 9.8 per cent fall into this category. Therefore, it is seen that the figure of 6.9 per cent at Howard University is only 1.8 times higher than the college group and perceptibly lower than the combined groups of medical and college students. Thus, it would appear that tuberculosis disease is not significantly higher in the Negro than in the white institutions. This similarity of results in the two races among college students can be explained as McCain[8] has pointed out on the basis that Negroes in Colleges come from homes where the environmental, social, and economic, as well as the educational advantages are the best.

What Needs To Be Done

Although the extent of disease found in Negro colleges is comparatively small, this does not preclude the development of effective tuberculosis case-finding programs in these institutions.

In the first place, as has already been stated, it is an accepted dictum that this is the age group most ravaged by the disease. In addition, the incorporation of a tuberculosis case-finding program in a college has great educational value. From this group will come the teachers, ministers, physicians, lawyers, and other leaders of the race. If their interest is aroused, they will not only have an appreciation of this problem early in life, but will also carry it to their homes and communities and later will be able to offer intelligent leadership in the fight against this disease.

What, then, can be done towards the establishment of tuberculosis case-finding programs in Negro colleges? It is our opinion that the solution may be discussed in two parts, viz.: first, what the Negro colleges can do to help themselves, and second, what the Tuberculosis Associations and sanatoria can do to help the Negro institution in their communities.

The paucity of tuberculosis programs in Negro institutions is an expression of the lack of health education and health supervision in Negro colleges. In a recent survey[12] it was found that of forty schools with a total enrollment of 12,000 students, only seven institutions had a division of student health service; twenty-four required an entrance examination and five offered no type of examination. Only twenty-seven had required courses in hygiene and six offered no informational courses whatsoever. In about one-third of the schools, the administration of the health service was in the hands of individuals not medically trained. Thus, it is seen that Negro colleges must be stimulated to the development of better health services with effective health education programs administered by adequately trained personnel. This foundation is needed for the development of a continuous early diagnosis campaign. The tuberculosis case-finding program is not over as soon as entering students have been tuberculin tested and the positive reactors X-rayed. This is only the beginning. During the year there must be follow-up of latent and suspected cases; advice as to rest and study routine, and careful examinations of all cases of prolonged cough, pain in the chest, etc. In addition, there must be the development of educational programs, such as lectures in classrooms, moving pictures, demonstrations, and exhibits. All of this can only be done by a well organized, even though small, health service.

Having discussed the problem that faces Negro institutions, we can now turn to ways and means by which this Association can help Negro schools. Before doing this, however, it is well to cite examples of the splendid work which is already being done by members of this group. The parent organization, the National Tuberculosis Association, has for some time been keenly interested in the Negro and through its Committee on Tuberculosis Among Negroes under the able direction of Dr. C. St. C. Guild has accomplished much during the past five years. The college essay contest, yearly grants to Howard University for the study of health services in Negro colleges; an educational moving picture with a Negro cast, are only a few of its accomplishments which specifically deal with the college group. The program for the tuberculosis study of college students in the state developed by the Extension Department of the North Carolina Sanatorium is worthy of imitation by other state sanatoria. Many local associations through their Negro workers are promoting very fine activities. One or two may be mentioned as examples. The South Carolina Tuberculosis Association has not only tuberculin tested and X-rayed students in the Negro colleges, but in addition, has stimulated the development of health service facilities in two Negro colleges in the state and through a grant from the National

Tuberculosis Association, developed last year a health education institute for Negro summer school teachers. The Louisville, the Atlanta and District Tuberculosis Associations are doing very fine promotional and educational work in the Negro colleges in their communities.

Although much is being done, much remains to be done. The five following suggestions, in our opinion are worthy of consideration:

1. The employment by each association of a well trained Negro worker to act as a liaison between it and the community. Among other things, such a person can serve effectively to sponsor the college essay contest, to develop or help in the formulation and teaching of health courses and to foster the development of adequate health services.

2. The tuberculosis associations in coöperation with the college authorities, should actively sponsor yearly tuberculosis case-finding programs in the Negro institutions in their communities. Since most of the Negro institutions are small and exist on very marginal budgets, the local associations should defray in part the expenses incident to such a campaign.

3. More effort should be directed toward health education in these colleges. These efforts should be well organized and coördinated and should be done regularly so that they will have a more lasting effect upon the college community.

4. Yearly institutes on health education should be sponsored by the state associations for teachers throughout the state who are in charge of physical and health education. These individuals would serve as an effective nucleus for future activities.

5. Lastly, the local or state societies should offer to college physicians in their communities the opportunity to acquaint themselves with the advances in case-finding procedures either in their clinics or in short refresher courses at state sanatoria. Such training would be of inestimable benefit to the college physicians.

It is our belief that the adoption of some or all of these suggestions by the members of this Association would have a salutary effect on the development of much needed tuberculosis case-finding programs in Negro colleges.

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The Results of Sulfanilamide Therapy in Treatment of Gonorrhea*

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FOR the past year and a half, we have been using sulfanilamide almost exclusively in the treatment of gonorrhea at Lymanhurst Special Clinic. About a year ago, Dr. Ellison gave a summary of the results of treatment up to that time. At that time we were very enthusiastic about sulfanilamide. Today we still are enthusiastic. During the past year and a half, we have been able to evaluate sulfanilamide more thoroughly, and to realize that it is not a cure-all for gonorrhea, but is certainly the best therapeutic agent we have had to date. We have come to learn of its effect on both acute and chronic cases, and in cases where we have been able to observe the patients as long as a year after apparent cure.

*Presented at Lymanhurst staff meeting, Jan. 31, 1939.

Before going into the details and results of our experience at Lymanhurst Special Clinic, I would like to touch on just a few points in the recent literature regarding the mode of action of sulfanilamide. Most work has been done, of course, regarding the action on streptococci, but since no definite conclusions have been made that there is any difference in mode of action on pneumococcus or gonococcus, we can probably safely assume the same theories of action.

First let us consider the *absorption and distribution* of sulfanilamide in the body fluids:

1. Sulfanilamide in the free state and acetylsulfanilamide are found in equal quantities of each in both the blood and urine.

2. The spinal fluid contains about 25 to 30 per cent less than the blood.
3. Sulfanilamide is also found in, (a) prostatic fluid, (b) amniotic fluid, and (c) breast milk.

Here it is interesting to note that when given to a nursing mother, the milk contains the same amount of sulfanilamide as the mother's blood at that time. It has been found not to harm the infant, but neither will there be sufficient amount of the drug to be of therapeutic value to the infant.

Sulfanilamide is a depressant and the occasional deaths that can be attributed to the drug are caused by respiratory or cardiac paralysis.

Administration

We have given the drug exclusively by mouth. Prontosil was given chiefly by hypodermoclysis, but its use is now very limited except in cases of severe nausea and vomitting, or coma. Rectal administration of sulfanilamide is unsatisfactory due to uncertain absorption. Topical administration of sulfanilamide has been used with doubtful results. I believe, however, Minneapolis General Hospital has been using it in a series of compound fractures with very good results.

Toxic Reactions of Sulfanilamide

These vary from the almost universal symptoms of fatigue and anorexia to the less common reactions of methemoglobinemia and sulfhemoglobinemia.

(a) *Malaise*: varies from mild fatigue to almost exhaustion and prolonged deep sleep. Often the patients say they are too tired to eat.

(b) *Anorexia*: very frequently patient loses all taste for food, and frequently loses five to ten pounds while treating.

(c) *Nausea and vomitting*: varies from mild nausea to rather severe vomitting. We have found the administration of equal amounts of sodium bicarbonate almost eliminates any marked nausea or vomitting.

(d) *Fever*: rather uncommon, usually ranges from 100 to 101 or 102, and accompanied with other toxic signs such as cyanosis and nausea and vomitting.

(e) *Dermatitis*: quite rare, usually comes on after the patient has been on the drug a week or ten days, or even just after the drug has been discontinued.

Rash: maculo-papular rash most frequently on forearms, face, legs or buttocks. Quite often it is *unilateral*. It usually disappears 24 or 48 hours after sulfanilamide is discontinued, and requires no other therapy except local treatment for the itching. Even if the drug is continued, the rash will fade in about 72 hours.

Sunlight or ultra-violet light will tend to bring on a sulfanilamide rash. This has occurred in a few of our transient patients who are prone to bask in the sun between doses of sulfanilamide.

(f) *Edema*: infrequent. We had one interesting case of a boy who complained of a fullness in his throat after five days of sulfanilamide treatment. Upon examination, we found a very marked edema of the uvula. Withdrawal of the drug, adrenalin and hot irrigations gave no relief, and finally the boy was referred to the Minneapolis General Hospital where amputation of the uvula was necessary. This is the only case of edema we have seen except two cases where there has been an dematous swelling of the foreskin after the institution of sulfanilamide therapy. This gradually subsided although sulfanilamide was continued.

(g) *Leukopenia*: agranulocytic anemia and hemolytic anemia are all rare—we have had no cases at our clinic.

(h) *Methemoglobinemia and cyanosis*: Cyanosis in a mild degree has been quite common, especially during the first few days of treatment when the dosages of the drug are high. At first, we discontinued sulfanilamide with the first signs of cyanosis, but have since found that unless it is marked, or accompanied by other more severe toxic signs, it is perfectly safe to continue with the regular doses of sulfanilamide together with equal amounts of sodium bicarbonate. The cyanosis appears rather difficult to explain since tests show no decreases in the oxygen carrying capacity of the blood, and no appreciable increase in the amount of methemoglobin. More recent work explains this on a basis of blue pigmentation derived from sulfanilamide, and picked up by the red blood corpuscles to give the cyanatic-like color. The cyanosis of methemoglobinemia or sulphemoglobinemia are, of course, true cyanosis.

(i) *Sulphemoglobinemia*: uncommon, usually associated with history of recent medication with sulphate cathartic such as magnesium sulphate, Sal Hepatica, or use of magnesium sulphate dressings. It is of interest to note here that in any liquid stool, whether due to cathartic or not, hydrogen sulphide is formed in the splitting of cystine of partially digested food, and therefore sulphemoglobinemia can occur even though a sulphate cathartic has not been taken—such as may occur in an infectious diarrhea. Sulphemoglobinemia can be prevented by: (1) warning patient to take no cathartic other than those ordered by the doctor; (2) use of mineral oil and enemas if necessary; (3) limiting eggs in diet to two eggs per day to cut down the sulphur intake; (4) giving enemas before sulfanilamide is instituted if the patient has taken sulphate cathartic the past day or so.

The best treatment of the complication is transfusions and intravenous glucose. Oxygen therapy is of little and questionable benefit, but is usually used in conjunction with other treatment.

Theories of Action of Sulfanilamide

Here we run into a great many conflicting theories, none of them conclusive, but from them we can at least get some ideas as to the action of this powerful drug. Some of the most interesting facts regarding the action of sulfanilamide are these:

1. Relative inefficiency of sulfanilamide against a strain of bacteria in vitro, while in vivo, or if reinforced by human serum, the bacteriostatic effect is tremendous.

2. Reports of cures in cases where very small doses of sulfanilamide were given and where concentrations of the drug were as low as 1—10,000 or 1—18,000, and

still affected the miraculous cures that started sulfanilamide on its amazing climb in medical therapeutics.

3. Infections with various strains of the same organism may, or may not, be cured even though the concentration of sulfanilamide is very high and the patient tolerates the drug well.

4. The fact that there is no regular effect on phagocytosis or increase of leukocytis, or evidence of definite opsonic effect to enhance phagocytosis, sulfanilamide therapy is apparently *potentiating* as shown by no direct bacteriostatic action in saline media, but a marked one in human serum even in dilution of 1—100,000 sulfanilamide. Apparently bacterostasis and phagocytosis reinforce each other to promote cure. The theory of action of sulfanilamide has been a bacteriologist's argument and has brought great emphasis on the fact that in vitro experiments may mean nothing regarding the effect of the drug in vivo. Recently bacteriologists claim to obtain equal bacteriostatic effect with sulfanilamide in normal saline as in human sera, if the incubation temperature is raised to 40 centigrade.

5. Still another argument is that sulfanilamide exerts a restraining power on bacteria, and holds them in check until the body has a chance to build up its own antibodies to promote a cure. On this basis some men have advised withholding of sulfanilamide for two weeks in acute cases. However, the increased danger of complications overshadows any probable benefit of immune bodies which may be produced. Sulfanilamide probably makes the organisms less virulent, and hence more easily phagocytized.

6. The so-called "resistant factor" of the host has been shown to be of importance especially in experiments done on rabbit pneumonia. Here sulfanilamide decreases the pneumonia proper, but the host will not survive unless the so-called *resistance* or *fitness factor* is up to a certain minimum level so that the rabbit can remove the germs from the blood stream and, in this way, take advantage of the sulfanilamide action which has held them in check and probably rendered them less virulent. This fitness factor can be supplied, or raised, by administration of liver, vitamin C, or suprarenal extract. Perhaps some of our failures can be cured with the addition of high vitamin C and liver concentrates.

Since June, 1937 when we first started using sulfanilamide at Lymanhurst Special Clinic, we have used it routinely on all new male cases, and on some of the female cases. It is not used routinely in females, because some of the women are treated in evening clinic under a different routine. The regular courses in average adult, male or female, consist of the following:

80 grains per day for 4 days	In 4 equally
60 grains per day for 3 days	divided doses
40 grains per day for 7 days	throughout
20 grains per day for 7 days	the day.

It is usually given with equal amounts of sodium bicarbonate to decrease acidosis and toxic symptoms. All our patients are outpatients, and a good percentage are transients staying at the Mission or in parks and box cars. In the series chosen to evaluate the results of sulfanilamide, I have picked out 140 male and 49 female cases. No case was taken that was not followed until definite cure occurred, and usually a long period of observation after apparent cure was possible, especially in those residing here when the patient was returning every week for antiluetic treatment.

Our judge of a cure consists of the following in the male:

1. Negative smears from prostate.
2. Negative smears after sound.
3. Urine absolutely clear; or if persistent shreds, then multiple negative smears of shreds.
4. Negative smears after 1% Ag. No. 3.
5. No reaction after injecting 30/100 gonococcus filtrate intracutaneously.

A cure of female cases was complete after the following:

1. At least 10 to 20 consecutive negative smears instead of the required three consecutive smears.
2. Clinically negative for discharge.
3. Absence of pain or masses in the pelvis.

In this series a (1) *good result* meant negative smears, clear urine and absence of discharge within two weeks after beginning sulfanilamide and using only sulfanilamide treatment. (2) A *fair* result meant definite improvement with sulfanilamide, but in these cases additional medication such as neosilval, protargol irrigations, or Corbus-Ferri filtrate was used. Here an apparent cure with absence of discharge, shreds and negative smears had to be present before one month after initiating sulfanilamide therapy. These cases include a great majority of the chronic cases, with or without complications such as epididymitis, posterior infections, or pelvic infections in the female. The group classified as *failures* of sulfanilamide therapy included those patients who after one month still had positive smears, or clinical signs of gonorrhea. Eventually practically every one of these "failures" was cured with adjuvant treatment, but in most instances they recovered faster than would be expected under these conditions. We could not help but feel that sulfanilamide had really hastened a good many of these cases to eventual cure.

Our results are as follows:

140 males treated of which 89 were acute, and
51 chronic,
95 cases or 68% were *good* result,
17 cases or 12% were *fair* result,
or a total of 112 or 80% *cure*.
28 or 20% classified as *failure*.

Of this group of men, 14 cases or 10 per cent had to discontinue the drug because of inability to tolerate sulfanilamide. In most instances, it was discontinued with mild toxic signs of fever, malaise, or slight cyanosis. At present we do not discontinue sulfanilamide with these mild symptoms.

Ten cases or 7 per cent had recurrence of positive smears after one course of sulfanilamide. Most of these occurred in those who did not follow directions, and most of them cleared up with a second course of sulfanilamide.

The complications were as follows:

16 cases or 11%, epididymitis—only about 2 or 3 of these developed after starting sulfanilamide treatment.
21 or 15%, posterior infections—only 3 or 4 developed while on sulfanilamide.
4 or 2.8%, stricture—only one case developed stricture after starting sulfanilamide treatment.
2 or 1.4%, toxic edema from sulfanilamide.
2 or 1.4%, toxic rash from drug.
8 or 5.7%, any marked elevation temperature.
6 or 4.3%, rather marked cyanosis.

The great majority of patients had milder symptoms of headache, fatigue, anorexia, malaise, and slight degree of cyanosis.

The observation of 49 female cases of gonorrhea with 30 acute and 19 chronic cases showed the rather surprising fact that the same percentage were cured as those in the male—namely:

34 cases or 70% *good.*
5 cases or 10% *fair.*
39 cases or 80% *cured.*
10 cases or 20% *failure.*

Three cases or 6.1 per cent had recurrence of positive smears, 4 or 8.1% severe reactions to necessitate discontinuing the drug.

The complications were as follows:

1, arthritis which cleared up completely after beginning sulfanilamide therapy.
10 cases or 20%, salpingitis,
3 cases or 6%, Bartholin abscess,
5 cases or 10%, rather marked bleeding—we have noticed an increased menstrual flow, or tendency to menstruate earlier than usual with sulfanilamide treatment.
7 cases or 14%, moderate fever,
3 patients had marked cyanosis.

It is interesting to note here that in comparing our figures with a compilation of 2,672 cases taken from various clinics, they have found 80.9 per cent cure and 19.1 per cent failure—practically identical with our figures. Vest, Harrel & Peters in Johns Hopkins Bulletin, November, 1938, advise hospitalization for ten days with sulfanilamide treatment, and if no response in five to seven days, discontinue the drug and repeat in four to five weeks if other methods of cure fail. They find 60 per cent give excellent response, and are cured, but claim recurrences are common. They find that the response to the drug falls in three classes:

1. A few respond excellently to very small doses,
2. Most respond well to moderate doses,
3. Few fail to respond to even large doses.

Herbert Schoenrich finds the average cure takes about twenty days and gives 60 per cent cure. He gives 40 per cent as having complications — this figure seems rather high as compared to our observations.

Vest, Hull and Pitts report on twenty-five cases of hospitalized patients treated with sulfanilamide, and found there is no appreciable difference in concentration of sulfanilamide, either free or combined, in either blood or urine to account for response or non-response. An interesting fact is that they found that often there is a marked reduction of gonorrhea organisms in the urethra *after* starting sulfanilamide, but *before* any sulfanilamide has come through the urethra *in the urine.* This tends to strengthen the view that sulfanilamide acts through the body fluids and not through the urine per se.

Marshall, Cutting & Cover, reporting on various sulfanilamide derivatives say this:

1. Ethanol sulfanilamide, very soluble but excreted rapidly and hard to maintain blood level.
2. Disulfanilamide, very slightly soluble in water and is absorbed slowly and excreted rapidly in comparison to sulfanilamide.
3. Sulfanilamide, moderately soluble and moderate excretion time, so best to maintain blood level.

Sulfanilamide is absorbed slightly from the stomach and rapidly from the intestine. They have also found the estimation of free sulfanilamide is a good index of blood concentration as the amount of conjugated form is not sufficient to make any difference.

Speert, by giving sulfanilamide to mothers in labor, and checking the blood in the cord after delivery, found that the sulfanilamide concentration in the fetal circulation approaches the concentration of sulfanilamide in maternal blood. He has observed no ill effect on the new born child.

In so far as complications responding to sulfanilamide, we have had very excellent results with prompt relief of pain and recession of swelling in cases of epididymitis. Likewise most posterior infections have responded promptly. There have been several cases where very prompt cures have occurred in as few as two or three days of sulfanilamide therapy and most of these have been checked later and no relapses have occurred. One young man, who also was treating for lues, had been treating for over two years for gonorrhea and had been running consistently positive smears despite vaccine, massages, deep silver nitrate irrigations, and even fever therapy. He was one of the first to be given sulfanilamide at our clinic. He was cured in one month with no recurrence, or trouble after one year's observation.

Our failures are difficult to explain—they occur equally in acute and chronic cases, in complicated and non-complicated cases, and in those who tolerate the drug and have taken the prescribed dosages. Possibly there may be certain strains that are sulfanilamide resistant. A hint of this may be found in our series in which both the husband and wife treated at the same time, and *presumably* were infected with the same strain of gonococcus. This includes ten couples.

1. Both responded very well to sulfanilamide,
2. Both had recurrences after routine treatment (not sulfanilamide), but both cleared up with sulfanilamide second time.
3. Husband,—failure with sulfanilamide, had epididymitis and posterior on sulfanilamide treatment, both were treated very soon after

infection. Wife,—failure, developed pelvic infection on sulfanilamide treatment.

4. Failure both—pelvic infection in female, and posterior and epididymitis in male.
5. Fair response both.
6. Very poor both, recurrences—probably re-infection here.
7. Both slow—recurrences with both.
8. Both treated and "cured" without sulfanilamide, had relapse and both later cured with sulfanilamide.
9. Both poor and slow response to sulfanilamide.
10. Good response in both.

We have noted that a patient treated with sulfanilamide, and who does not respond, usually responds less to filtrate, protargol and irrigations than those not previously given the drug. This may be due to drug idiosyncrasy or lack of immunity build-up in the patient, or increased resistance of the gonococcus. The question of contra-indication of other drugs to sulfanilamide is, as yet, not settled. We have used sulfanilamide along with other drugs such as bromides, luminal and other sedatives with no unusual effect. In three or four cases, where a primary luetic lesion developed, we have given concurrent treatment with neoarsphenamine or mapharsen with no reaction whatsoever. In this connection it is of interest to note a case of a young man 26 years old who came to clinic with a large destructive lesion on the glans penis. Darkfield was positive for syphilis. This patient had been infected, and cured of syphilis *twice* previously. This was his *third* primary lesion. Heavy doses of arsenicals did not stop the destructive process. Smears were repeatedly negative for chancroid, streptococcus, or other organisms. Finally after four weeks of arsenical treatment, sulfanilamide was tried in desperation. Within two days the lesion began to heal rapidly. I have no explanation for this except that the lesion apparently was a primary luetic chancre, plus a chancroid infection, although the smears were negative for bacillus of Ducrey.

SUMMARY

1. Sulfanilamide is by far the best treatment of gonorrhea, complicated or otherwise.
2. Severe toxic effects are few and far between if given under supervision of a doctor.
3. It is convenient to use for the patient; obviates messy irrigations and decreases complications.
4. Its use as prophylaxis has apparently not been established, but is worthy of investigation.
5. In gonorrhea of pregnancy, it can apparently be used with safety to mother and child and should prevent gonorrhea ophthalmia.
6. The greatest battle we have to fight will undoubtedly be that of counter-prescribing with resultant insufficient doses, apparent cases with relapses, and probably fatal results in a few non-tolerant individuals.
7. Sulfanilamide is undoubtedly much more economical to the patient, the doctor, and the clinic, as it cuts the cost of drug and clinic's time.

Some Useful Prescriptions*

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ANCIENT medicine was nasty medicine, and I like to think that the medicine of the future shall be pleasant. In these days of improvement in all lines of human endeavor, isn't it fair to believe that medicine can also be improved by being stripped of offensiveness? I believe that in this day it is entirely unnecessary ever to insult the human palate with offensive medication. This is a thesis that I would be glad to defend against all comers: "Modern pharmacy has provided us with the means of taking away from medicine all nastiness." I have spent a good many years of my life on the study of this question of palatable medication.

Let us start with the statement of the first principle in medication—make your medicine insoluble whenever this can be done without sacrificing efficiency. This can generally be accomplished by carrying out the principle to capsulate everything that can be capsulated.

Analgesic Capsules: Next to saving of life, there is nothing of greater importance to the medical profession than relieving of pain. At Cook County Hospital we have taken the opportunity to study analgesia. We have about ten different capsules that contain half an official dose of various analgesics, and these capsules are given to patients, most of whom are sufferers of carcinoma; these patients have about as constant a pain as human beings can have. They are given the instruction to take one of the capsules every hour until relieved, and then as often as necessary. We give these people 100 capsules, and when they come back, usually at the end of the week, we have them bring back the ones they have not used; we then count the unused capsules. We can, therefore, estimate the relief-giving qualities of these particular capsules. The more capsules are unused, the more powerful is the analgesic assumed to be. The pa-

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tient also is given a slip upon which he notes the hours at which he takes the capsules, the number of hours of sleep he has had; he is also asked how he felt and how he liked the effect of the medicine. In this way, we can compare one capsule with another as the patient does not get the same one the next week; and, as the capsules all look alike, we can do this without the patient's knowledge.

The medicine which has so far reached first place as an analgesic is acetylsalicylic acid; and this even though we have among these capsules morphine as well as codeine, *i. e.*, half doses of morphine and half doses of codeine. Aspirin, in the short time since it has been introduced, has swept over the globe and become one of the most extensively used of all medicines.

We might therefore start our analgesic prescription with acetylsalicylic acid, which is best given in powder form in capsules.

℞ Acetylsalicylic Acid 5.00 Gm.
Divide into 15 capsules.
One every hour until relieved.

These capsules have not been sufficient to relieve everybody; it is a fact that in some patients they have produced such untoward effects as sweating and ringing in the ears, and occasionally vomiting. This has given us the opportunity of studying combinations. For one thing, it is possibly well to add extract of hyoscyamus, which may lessen the incidence of sweating produced by the aspirin.

Some patients who are not relieved by acetylsalicylic acid get relief when we add phenobarbital to it. Such combinations seem to justify Bürgi's rule, which postulates that when medicines that act differently in producing the same results are combined with each other, they reinforce each other; while, when medicines that act in the same way are combined with the other, they are merely additive both in their untoward as well as their desired effects. In other words, there is no special advantage to combine acetanilid and acetophenetidin as these two act in practically the same way; but acetylsalicylic acid and phenobarbital act in different ways in producing their analgesic action. We might write a prescription in some such way as this:

℞ Extract of hyoscyamus 0.25 Gm.
Phenobarbital 0.50 Gm.
Acetylsalicylic Acid 5.00 Gm.
Divide into 15 capsules.
One every 2 to 4 hours as required.

You will note I use English in prescribing. I have found that English is just as good as Latin, and that students have much less trouble in writing English than Latin. I would also like to urge the members of this great state medical association to vow here and now to discard the old system of weights and measures in prescribing and to use the metric system instead. It is, indeed, easier to write in the metric system than in the old system. Let us say we want to prescribe 5 grains of acetylsalicylic acid. I put down 5 grams; as 5 grams will give us 15 doses of 5 grains each, because 1 gram is 15 grains. And if you want to write for ¼ grain of extract of hyoscyamus, you write for 0.25 Gm. As to the proportions, it all depends whether you want put the patient to sleep or not. If you use too much phenobarbital, it puts the patient to sleep or makes him dizzy. During the day, it is not desirable to increase the proportion beyond the 1 to 10 ratio. If the patient has so much pain that he cannot sleep at night, it might be desirable to increase the dose of the phenobarbital even to the extent of bringing it up to 1 grain per dose. The dose of the extract of hyoscyamus, you will notice, is not very large. It is ¼ of a grain (0.25 Gm. for 15 doses) because there are some people who are so susceptible to this drug that they are likely to complain of dryness of the mouth, if the dose is larger.

When prescribing symptom medicine it is often of advantage to use a small unit dosage so that a dose may be taken every hour until the pain is relieved, then every two to four hours as required. This can readily be done by dividing the quantity of the above given prescription into 30 instead of 15 capsules. The larger unit capsules are, however, desirable for patients suffering from relatively heroic pain such as that of gallstone or renal colic, or of inoperable carcinoma. Indeed, in some of these cases it is necessary to add an opiate. I have found that the addition of codeine phosphate in the same dosage as that of phenobarbital greatly increases the analgesic power of the combination. This is the more remarkable because the same dose of codeine does not have much analgesic effect and yet, when added to the analgesic combination, it does decidedly increase its pain-relieving power. I have discovered this in the following way. A patient with gallstone colic who has secured relief from such capsules asks the pharmacist to refill the prescription. The pharmacist then inquires over the telephone what he should do about this Harrison-law prescription. I advise that he should refill it without the codeine. Then not infrequently the patient complains afterward that the medicine that he had refilled did not act as well as the first prescription did.

The chief untoward effect I have noted from this combination is the sense of dizziness occasionally complained of as resulting from it. This is due to the phenobarbital and is especially likely to be complained of by patients with high blood pressure in whom the phenobarbital may reduce the pressure below the point that is comfortable to the patient. In such a case one should reduce the dose or delete the phenobarbital from the combination.

Antiasthmatic Capsules: There is one kind of patient who should not have acetylsalicylic acid prescribed for him, and that is the allergic patient, most especially the one with asthma, as aspirin is not infrequently badly borne in an allergic person. In such patients it is best to substitute aminopyrine in the same dose for the acetylsalicylic acid. One can secure a prescription of especial efficiency for a patient with asthma by adding to it ephedrine sulfate in half grain dosage (½ gram for 15 doses) as in the following prescription:

℞ Extract of hyoscyamus 0.25 Gm.
Ephedrine sulfate 0.50 Gm.
Phenobarbital 0.50 Gm.
Aminopyrine 5.00 Gm.

Divide into 15 capsules.
One every 2 to 4 hours as required.

In a particularly bad case of asthma I would even advise adding the codeine as above suggested. One thing is certain, that with these analgesics and antiasthmatic combinations, the use of morphine is rendered largely superfluous excepting in cases in which vomiting makes hypodermic administration mandatory.

Cardio-sedative Capsules: Our medical literature, I believe, makes quite a bit too much of cardiac stimulation and does not sufficiently discuss cardiac sedation. To most patients complaining of palpitation and precordial distress or anginoid pains, the prescribing of digitalis is generally a mistake. These patients do not suffer from cardiac decompensation, a condition in which digitalis is specific, but rather from cardiac irritability which may be increased by digitalis. They need a cardiac sedative. Such a one is sparteine sulfate which should not be given in smaller dosage than a grain or two, and even this may have to be repeated in half an hour or an hour in order to secure a satisfactory result. It is well to associate this vagus nerve stimulant which slows the heart with a nerve sedative such as carbromal, which is one of the least harmful of these, more powerful than bromide and less liable to produce untoward effects. When the heart distress tends to keep the patient awake or the blood pressure is excessive, it is well to add phenobarbital to this combination, which would result in a prescription like the following:

℞ Sparteine sulfate ..... 1.0 Gm.
Phenobarbital ..... 0.5 Gm.
Carbromal ..... 5.0 Gm.
Divide into 15 capsules.
One every 2 to 4 hours as required.

These prescriptions may suffice to emphasize the importance of the precept to encapsulate all medicine whenever possible. There are, however, certain medicines that should not be prescribed in capsules. These are in general highly soluble substances or those that are very irritating. All of these should be prescribed in solution and in dilute solution. When it comes to the prescribing of liquid medication we must aim at palatability for there is no use prescribing a medicine, no matter how good a one it be, if the patient refuses to take it.

Colloid Lessens Taste Sensation: A good illustration of the rôle of colloids in lessening taste sensation is given by the following prescriptions:

℞ Carbamide (urea) ..... 15.00 Gm.
Syrup of acacia, to make ..... 60.00 cc.
Mix and label: Teaspoon in water every 4 hours. *(Diuretic.)*

℞ Calcium Chloride ..... 5.00 Gm.
Water ..... 5.00 cc.
Syrup of acacia, to make ..... 60.00 cc.
Mix and label: Teaspoon in water every 2 hours. *(Urinary acidification.)*

In these, the syrup of acacia, which itself is relatively tasteless, lessens to a decided degree, I believe, the hot, burning taste of the carbamide as well as the acrid saline taste of the calcium chloride. For those who are not familiar with the term "carbamide", I would like to say that it is merely another term for urea; and the term, I believe, that should be used in prescribing urea because patients, in general, object to taking anything internally that by its name makes one think that it might have been derived from urine which, as a matter of fact, is not the case, for carbamide is prepared synthetically.

Syrup of glycyrrhiza is another example of the value of colloid in disguising, and I would like to submit the following three prescriptions in illustration of this proposition:

℞ Potassium bromide ..... 30.00 Gm.
Water ..... 30.00 cc.
Syrup of glycyrrhiza, to make ..... 120.00 cc.
Mix and label: Teaspoon in glassful of milk after meals and at bedtime.
(Nerve sedative.)

℞ Ammonium chloride ..... 10.00 Gm.
Syrup of glycyrrhiza, to make ..... 120.00 cc.
Mix and label: Teaspoon in half glassful of water every 2 hours. *(Expectorant.)*

℞ Potassium iodide ..... 10.00 Gm.
Syrup of acacia ..... 60.00 cc.
Syrup of glycyrrhiza, to make ..... 120.00 cc.
Mix and label: Teaspoon in water 3 times daily after meals. *(Expectorant.)*

You will note that these are salines in every instance. Syrup of glycyrrhiza, I find, has a special disguising value for these substances, which partly resides in its colloidality and partly in its double sweetness. It has the immediate sweetness of sugar and the lingering sweetness of glycyrrhiza, so that the syrup of glycyrrhiza is a better disguising agent than either syrup or glycyrrhiza are by themselves. The important thing is that the syrup should be made from a good quality of glycyrrhiza, a sweet, not acrid fluid extract. Such, I would like to submit to the pharmacists, may be prepared by extracting a good quality of glycyrrhiza to but 75 per cent, for the acrid principle is not extracted until the end of the process.

The following prescriptions feature syrup of cherry, which I believe to be one of the most delicious syrups of the National Formulary.

℞ Diluted hydrochloric acid ..... 10.0 cc.
Syrup of cherry, to make ..... 120.0 cc.
Mix and label: Teaspoon in wineglassful of water. *(Digestant in hypochlorhydria.)*

℞ Syrup of hydriodic acid ..... 20.0 cc.
Syrup of cherry, to make ..... 120.0 cc.
Mix and label: Teaspoon three times a day after meals. *("Alterative".)*

You will note both of these are acidic medicines, for vehicle. I would be glad to suggest to physicians that they hereafter prescribe syrup of cherry instead of syrup of wild cherry because the former is so very much more pleasant. I appeal to the pharmacists that they employ the real cherry syrup made according to the National Formulary directions, and not the syrup that is so commonly used in soda fountain drinks because the latter is artificially colored and flavored and not nearly so nice a product.

Syrup of cinnamon is a particularly eligible vehicle for

salicylate and iron salts, as is shown by the following prescriptions:

℞ Sodium salicylate 5.0 Gm.
Potassium bicarbonate 5.0 Gm.
Cinnamon water 25.0 cc.
Syrup of cinnamon, to make 60.0 cc.
Mix and label: Teaspoon in tumblerful of seltzer water every hour until relieved or until excessive perspiration or other untoward symptoms occur; then every 2 to 4 hours. *(Antirheumatic.)*

℞ Iron and ammonium citrate 10.0 Gm.
Water 10.0 cc.
Syrup of cinnamon, to make 120.0 cc.
Mix and label: Tablespoon in water 3 times a day after meals. *(Hematinic.)*

It blends with the taste of these substances very well; and, in connection with the salicylate prescription, it has the advantage that it disguises the brownish discoloration that is liable to develop on standing. This discoloration does not do any harm except that it worries the patient.

I would like to call the pharmacists' special attention to the fact that this syrup of cinnamon must be prepared according to the formula of N. F. VI, for the syrup of cinnamon of the former N. F. was made from cinnamon bark, contained tannic acid, and, therefore, was incompatible with iron and with salicylate. The new syrup of cinnamon is made from cinnamon water which does away with that incompatibility.

The Aromatic Syrup of Eriodictyon is a veritable pharmaceutic masterpiece. It is particularly valuable to disguise the bitterness of alkaloids, which it does by forming with them an insoluble resin salt that, however, readily dissolves in the stomach.

℞ Quinine ethylcarbonate (euquinine) 5.0 Gm.
Water 5.0 cc.
Aromatic syrup of eriodictyon, to 60.0 cc.
Mix and label: Teaspoon in water every 4 hours. *(Antimalarial.)*

℞ Codeine phosphate 0.10 Gm.
Water 5.0 cc.
Aromatic syrup of eriodictyon, to 60.0 cc.
Mix and label: Teaspoon in water every 2 to 4 hours as required for excessive cough. *(Antitussic.)*

℞ Strychnine sulfate 0.015 Gm.
Water 5.0 cc.
Aromatic syrup of eriodictyon, to 60.0 cc.
Mix and label: Teaspoon 3 times a day after meals. *(Motor excitant.)*

The taste of these bitter substances is disguised in the above prescriptions. The quantity of bitter alkaloid that can thus be disguised is rather limited, however. The prescriptions given carry doses that are adequate with children, for whom this administration form is chiefly necessary. It is inadequate for adults who, as they can swallow capsules, do not need this mode of administration.

I shall introduce to you now Iso-elixir, one of my brain children of which I am rather proud. It is almost too much to ask medical students and physicians to carry in mind the percentage of alcohol present in various liquid extractive preparations. The Iso-elixir renders this unnecessary as the physician merely writes "Iso-elixir", which means to the pharmacist that he is to mix the "low alcoholic elixir" and the "high alcoholic elixir" in such proportion as to equal the alcoholic strength of the liquid galenical or chemical that is to be dissolved. Thus both the subjoined prescriptions yield perfectly clear and permanent medicines and the same principle can be applied to any other alcoholic liquid medicament, as well as to any water- or alcohol-soluble substance, such as bromide or terpin hydrate or phenolphthalein. In case of sodium bromide, the low alcoholic elixir would be used because the substance is water-soluble; and in case of the others, the high alcoholic elixir would be used because they are alcohol soluble and water insoluble.

℞ Tincture of digitalis 30.0 cc.
Iso-elixir, to make 120.0 cc.
Mix and label: Teaspoon in water 3 times a day after meals. *(Cardiant.)*

℞ Fluid extract ergot 60.0 cc.
Iso-elixir, to make 120.0 cc.
Mix and label: Teaspoon in water every 4 hours as required. *(Oxytocic.)*

I would like to call your special attention to the vehicle value of glycerin by means of the following prescriptions:

℞ Soluble barbital 6.0 Gm.
Distilled water 32.0 cc.
Soluble saccharin 0.2 Gm.
Glycerin, to make 100.0 cc.
Mix and label: Teaspoon in water at bedtime. *(Hypnotic.)*

Note: This preparation carries the average official dose of 0.03 Gm. of soluble barbital per 5 cc. teaspoonful.

℞ Soluble phenobarbital 0.6 Gm.
Distilled water 8.0 cc.
Soluble saccharin 0.2 Gm.
Glycerin, to make 100.0 cc.
Mix and label: Teaspoon in water at bedtime. *(Hypnotic.)*

Note: 5 cc. teaspoon carries average official dose of 0.03 Gm. soluble phenobarbital.

℞ Potassium citrate 20.0 Gm.
Tincture hyoscyamus 30.0 cc.
Glycerin, to make 120.0 cc.
Mix and label: Teaspoon in glassful of water every 2 hours. *(Diuretic in dysuria.)*

(Preparation: Add potassium citrate to glycerin; heat on waterbath until solution is effected. When cold, add tincture of hyoscyamus.)

Another glycerite that is not entirely successful is the syrup of acetylsalicylic acid (aspirin) that can be secured by the following formula:

℞ Acetylsalicylic acid 3.0 Gm.
Potassium citrate 9.0 Gm.
Sucrose 25.0 Gm.
Tincture of lemon 1.0 cc.
Water 23.0 cc.
Glycerin, to make 100.0 cc.

Dissolve acetylsalicylic acid and potassium citrate in 23 cc. distilled water. Percolate sucrose with the solution and return it, if necessary, until all sucrose is dissolved. Add enough glycerin to make 100 cc. Average dose (5 cc. for child) represents: 0.15 Gm. acetylsalicylic acid. This preparation does not keep for more than a week or two. It is quite pleasant when first made. Within a week it becomes rather unpleasant, due to liberation of salicylic acid.

I would also like to submit a formula for compound syrup of ammonium mandelate. The publication of the formula is an attempt to cut short the rather circuitous route usually taken by preparations of new remedies. Manufacturers put such remedies upon the market with expensive propaganda for which the ultimate consumer must, of course, pay. It seems that such preparations could reach the hands of the patients at possibly one-half of the price it would otherwise have to command, were it possible to eliminate the advertising costs.

℞ Soluble saccharin	1.0 Gm.
Ammonium chloride	50.0 Gm.
Ammonium carbonate, in hard translucent pieces	80.0 Gm.
Mandelic acid	200.0 Gm.
Sucrose	400.0 Gm.
Benzaldehyde	0.04 cc.
Oil of fennel	0.1 cc.
Anethol	1.0 cc.
Fluidextract glycyrrhiza	175.0 cc.
Water, to make	1000.0 cc.

In a large vessel, mix mandelic acid and ammonium carbonate with 400 cc. distilled water; let stand till effervescence ceases. Resulting solution should be neutral to litmus paper. Dissolve ammonium chloride, sucrose, and saccharin in this solution by agitation. Add the fluid extract in which the oils have been dissolved; finally, distilled water to make 1000 cc. Average dose (15 cc.) represents: 3.0 Gm. mandelic acid and 0.75 Gm. ammonium chloride. (The term, "Syrup of Ammonium Mandelate," might stand for the same formula without the ammonium chloride, which might then advantageously be replaced by the same amount of sugar.)

Dr. Cathell, in his book on "The Physician Himself," says, "Every half minute spent in studying how to make your medicines pleasant is worth half an hour of any other kind of study."

If this is true, then perhaps I have not wasted either my time nor yours.

Artificial Fever Therapy by Physical Means

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FEVER therapy* is in reality a conception of ancient man. Some records of it occur through the ages since the beginning of history. The first written expression of this form of treatment appeared over 2,300 years ago when Hippocrates remarked: "If I could but create fever as easily as I can treat fever, I would become the greatest physician of all time."

The instinctive belief in the curative powers of heat has persisted in the minds of physicians and laymen for at least 3,000 years. The ancient Greek priest-physicians were perhaps the first to convert their thermal springs into therapeutic baths. There are authentic records of the use of hot baths in the treatment of infectious diseases by the ancient Romans, Egyptians, Chinese and Japanese. Many of the hot baths of the early Romans are still in existence. While these treatments were applied by the Romans indiscriminately and on a purely empiric basis, the therapeutic procedure followed the sequence of a sweat bath in a hot-steam chamber ("sudatorium") followed by a prolonged hot bath ("caldarium"), and finally, a cold bath in a room called the "frigidarium." It has been the custom to attribute much of the curative merit of this form of balneo-therapy to the mineral content of the water, but more recent observations indicate that the benefit is derived from the production of artificial fever.

In 1876, Rosenblum of Odessa (according to Potter), was the first to introduce malaria inoculations as a means of pyrotherapy in the treatment of general paresis. However, it remained for the Viennese physician, Dr. Julius Wagner-Jauregg, begun in 1900 and announced in 1918, to provide the stimulus which has led to the present remarkable interest in artificial fever therapy. For centuries, most physicians regarded fever as an alarming symptom of disease. After Virchow had ascribed various degenerative tissue changes to the effect of fever, the use of anti-pyretic drugs became common practice. Since Wagner-Jauregg's demonstration that artificial fever, induced by malaria inoculation was fre-

*Also variously called under different synonyms: electropyrexia, hyperpyrexia, hyperthermy, radiothermy, pyretotherapy, therapeutic fever and artificial fever.

quently capable of overcoming the ordinarily disastrous effects of syphilis of the central nervous system, it has become more and more apparent that fever is one of the most important mechanisms of defense against infections. There is a growing body of evidence which indicates that fever exerts an adverse influence upon the growth of certain bacteria, diminishes the potency of toxins, favors phagocytosis, and stimulates the development of immune bodies.

Wagner-Jauregg's success in the malarial therapy of dementia paralytica was soon confirmed by investigators in many parts of the world. The inherent dangers of engrafting one serious disease upon another as a therapeutic measure naturally led to a diligent search for a less hazardous method of producing a similar effect. Comparable results were obtained by other workers following inoculations with the organisms of rat-bite fever and relapsing fever. Repeated injections of vaccines prepared from typhoid or paratyphoid organisms or from hemophilus ducreyi, heteroproteins such as milk or peptone, and chemical substances such as sulphur, have yielded comparable results in those cases in which sustained high fever was induced. It became more and more apparent that simple fever production was the important, if not the only, factor in the production of similar therapeutic results with such a wide variety of fever-producing agencies. It was natural that these observations should stimulate a research for physical methods of artificial fever production.

In 1929, when America's noted physicist, Dr. Willis R. Whitney, discovered the physiologico-therapeutic possibilities of radiated electrical energy at high frequencies, scientific interest in fever therapy was stimulated to the extent that our current knowledge of the subject embraces an intelligent clinical picture of its effects upon the human organism.

Selected Methods of Hyperpyrexia

Richard Kovács, in his recent book, *Electrotherapy* (third edition), states that the accumulated experience of the past few years has developed suitable apparatus for the safe and comfortable induction and maintenance of artificial hyperpyrexia. On account of their efficiency and ease of control, electrical means are generally preferable for this work. A brief presentation of the mechanism of fever production by various physical means will elucidate the evolution of the present-day methods.

The temperature of the human body can be raised by external forms of heating which primarily heat the skin and in turn affect the inner organs via the blood stream and deeper circulation. Among these belong the various hydriatic procedures and heat radiation from luminous and infra-red sources and circulated superheated air. Penetrating forms of heating effect more of a general heating of all body tissues. These consist of high-frequency electrical currents, diathermy and short-wave diathermy. The body temperature can be raised equally quickly by both forms of heating.

In the heated body, according to Kovács, the heat regulating mechanism attempts to bring about heat loss, partly by radiation and partly by vaporization of water from the skin and lungs. With penetrating forms of heating which do not warm the atmosphere around the body, it has been found necessary to prevent too much heat loss through radiation by insulating the body. Such insulation in the form of tight wrappings with blankets or a closed treatment bag is, however, a source of great discomfort, for it prevents all movements by the patient; droplets of perspiration and moist areas of blankets also become potential sources of burns through overheating by condenser effect. In fever cabinets, heat loss by radiation is conveniently overcome by the hot air surrounding the patient, but on the other hand, due to the reversal of the heat gradiant of the body the skin becomes overheated, there is a possibility of extensive skin burns by the overheated air and there also occur much more frequently a number of disturbing reactions. As a matter of compromise between the two methods, there are now cabinets available in which the induction of heating is done by high-frequency methods and the temperature is then maintained by keeping the temperature of the cabinet only a few degrees over fever heat, thus avoiding overheating the skin.

General Diathermy. Neymann and Osborne were the first ones to report on artificial fever produced by diathermy. They employed a specially constructed apparatus with about double the output of ordinary diathermy machines. Some of the standard diathermy apparatus is capable of delivering the necessary intensity of 4,000 to 5,000 milliamperes. Large flexible metal electrodes are applied anteroposteriorly over a large surface of the body and the patient is covered with blankets or placed in an insulating bag to prevent heat loss. Although much work has been done with general diathermy, it is nowadays largely abandoned because the adjustment of the tight jacket or bandaging impairs the patient's breathing and finally, due to breaks in the electrodes and to the restlessness of the patient, burns will occur.

Coil Field Heating (Inductothermy). In this method by electromagnetic induction an inductance cable activated by a short-wave apparatus of about 24 meters is employed. The cable is placed under the patient enclosed in a treatment bag or is wound round this insulating bag. With a sufficiently powerful apparatus, maximal heat is produced in the vascular tissues and little heat in the superficial fatty tissues. This form of heating has proven quite efficient and is less apt to produce superficial burns than diathermy or short-wave plate methods.

Luminous heat cabinets consist usually of a box of celatex or wood, fitting over a table or hospital bed, or it may be a single unit. A number of carbon filament lamps (5 to 6) of a wattage of 100 to 200 are wired in the top of the box and controlled by a rheostat. The patient is placed in this box with his head protruding from one end through an opening around which suitably shaped cloth or soft rubber insulation serves to prevent heat loss. In most cabinets, sliding doors at the side allow access to the patient at all times. Bishop, Lehman

and Warren state that heating by radiant energy is the most convenient and economical method.

For combination of penetrating short-wave heating with a cabinet in which the patient can freely move and can be easily observed, a number of efficient devices have been constructed. Among these are a cabinet for electromagnetic induction combined with air conditioning, introduced by Kimble and further developed by Neymann. In this type of cabinet an inductance cable from a 26-meter short-wave apparatus serves to induce fever and slightly warmed and humidified air, penetrating heat dissipation, maintains it, keeping up the same temperature in the cabinet. The inductance cable is placed either in the form of a single loop under a layer of sponge rubber on which the patient rests, or is placed above the patient in the form of a pancake coil held in a disc.

The air conditioned cabinet of Kettering, Simpson and Sittler is an elaborate apparatus in which air temperature, relative humidity and air velocity may be automatically and adequately controlled. It enables the rapid elevation of the patient's temperature and maintenance at the desired level for an extended period. The air is heated by three controlled resistance units of a total of 1,500 watts; a container of water humidifies the air and a blower controls the air velocity. The average conditions for fever treatments are a dry-bulb air temperature of 130 to 150 F., a relative humidity of 30 to 50 per cent and an air velocity of 425 cubic feet per minute.

In spite of the large variety of fever-producing equipments offered, the ideal fever cabinet, according to Kovács, is still non-existent. Simpson states that the skill of personnel far transcends the perfection of apparatus, and that the worst possible apparatus managed with skill and the best possible technique is much more likely to give good results than an excellent apparatus placed in unskilled hands. One factor of equal importance is the careful selection of cases.

Advantages and Rationale of Electropyrexia

The advantages, according to Shepley, are many. With careful selection of cases and proper administration, there is practically no accompanying mortality. This sharply contrasts with 5 to 10 per cent mortality which is found in malarial therapy. A great advantage in electropyrexia is that it is available whenever desired, and that the frequency of application as well as the length and intensity of treatment are under complete control. One can thus modify the treatment as required for each individual case and completely control it. In this method, in contrast to malarial and foreign protein therapy, not only are normal processes stimulated, but further, the blood complement is not depleted, nor are the immune reactions disturbed. In many diseases electropyrexia provides a formidable weapon where, heretofore, there was practically nothing to offer. In addition, there are many distressing diseases such as certain cancers, neuritis and some forms of arthritis, in which, by the use of fever therapy one is able to modify and frequently to provide quick relief of pain. Drugs can be used in conjunction with fever therapy and thus improved results may be obtained.

Neymann sums up the rationale of the possibilities of artificial fever as follows: "(1) Certain micro-organisms become so completely parasitic and accustomed to the normal temperature of their warm-blooded host that they cannot flourish under any other conditions. (2) Their growth is inhibited and they may even be destroyed by an increase of the temperature of the host amounting to as little as 2.5 C. (4.5 F.) when maintained for hours. (3) The natural defense mechanisms of the body against disease and infection are stimulated and mobilized by fever. (4) It makes little, if any, difference whether this fever is produced by the body itself or by physical agents supplying heat from without." The cost of fever therapy apparatus varies between $150 and $1,500. A very satisfactory radiant heat cabinet can be built by any competent hospital engineer or carpenter for from $150 to $250.

Frank H. Krusen and Earl C. Elkins state that fever produced by physical means causes definite changes in the body. The pulse and circulatory rates are increased, the maximal increase occurring at temperatures between 103 and 104 F. The number of leukocytes is increased, but prolongation of the fever at high temperatures prevents leukocytosis and may lead to leukopenia. Nuclear changes occur in the polymorphonuclear leukocytes. Clearance of the blood creatinine content is increased, but there is little or no change in the non-nitrogenous constituents of the blood. Usually there is a varying degree of alkalosis. In the stomach, the chlorides are decreased and lactic acid is increased. The amount of urine is increased, but temporary oliguria generally occurs. There is temporary loss of weight after each treatment. Hemorrhagic encephalitis, hemorrhagic pneumonitis and deterioration of, and hemorrhage into, the adrenal cortex have been noted in instances of extreme hyperpyrexia. Regions of focal degeneration and cloudy swelling, and degenerative changes of the reversible type in the peripheral nerves have been noted in animals killed by eprolonged hyperpyrexia; these changes are probably due in great part to regional anoxia. The gonococcus is generally destroyed at 106 to 107 F. in 6 to 27 hours; in many cases of syphilis the spirochete disappears from the lesions after fever treatment, while other bacteria do not seem to be affected.

Some of the Diseases Treated

Space does not permit going into details about diseases treated at present by hyperpyrexia. Though around 50 diseases are reported in recent literature, just a few of the diseases that are being treated with a fair degree of success by fever therapy will be discussed. For the same reasons, reactions and complications of fever therapy such as restlessness, heat prostration, burns, herpes labialis, tetany, abdominal cramps, vomiting, vasomotor collapse, sudden uncontrolled hyperpyrexia and the pathogenesis of fatal cases reported in the recent literature will be omitted.

Gonococcic Infection: The most spectacular success has undoubtedly been obtained in the treatment of gon-

orrheal infections, including complications of prostatitis, salpingitis, periurethritis, cervicitis and corneal ulcers. Desjardins and his coworkers state that 90 per cent of their patients with gonorrhea, when given three to six sessions of sustained fever at 106 and 106.7 F. for five to eight hours were completely and permanently cured. Before real effective therapy could be instituted, definite facts about the resistance of the gonococcus to heat had to be ascertained. Carpenter, Boak, Mucci and Warren determined the vitro-thermal death time of 130 strains of Neisserian gonorrhea and found this to vary between 6 and 27 hours at 106.7. F.

In the treatment of gonorrhea of the female pelvis, the use of fever therapy combined with either diathermy to the pelvis or the Elliott treatments may be more effective than fever therapy alone. By the combined method of fever therapy and pelvic heating, one or two less treatments are necessary than with fever therapy alone. This method was developed by Bierman and Horowitz when they found it difficult to secure a cure in some of their female patients.

Dementia Paralytica: Artificial fever has been used in the treatment of a total of 809 patients with general paresis as reported in the literature. Of this number 226 or about 28 per cent have had a complete remission, while 279 or 35 per cent, are reported as improved and are now for the most part said to be no longer in need of hospitalization. Twenty have died as a direct result of treatment. This is approximately 2.5 per cent.

Chorea: Artificial fever was first attempted in the treatment of this condition in 1929 when it was noted that a child improved after a fever developed following the administration of a sedative. Later, injections of typhoid vaccine for the purpose of elevating the temperature were used. This, however, frequently caused severe illness and occasionally death. Hench has collected approximately 30 cases in the literature in which artificial fever has been used. The results vary from improved to "cured"; generally they are favorable. Three patients are reported as having had a recurrence.

Asthma: It has frequently been observed that fever associated with infectious diseases often temporarily and occasionally permanently controls the symptoms of allergic disease. It occurred to Feinberg that the production of fever by artificial means might be of value in the treatment of chronic asthma and other allergic conditions. In 1935, 117 patients were treated by this method. The results were favorable in 104 cases, unfavorable in 10 cases, and slight and indifferent in at least three other cases. Some had recurrences.

Contraindications to Treatment

Electropyrexia is not entirely devoid of danger, and certain well recognized indications must be scrupulously observed if disaster is to be avoided. Properly employed, it becomes almost free of all danger. Where physical resistance has been greatly depleted by chronic disease, care is necessary, for example, in the presence of active pulmonary, cardiovascular and renal disease. Thyrotoxicosis, advanced arteriosclerosis, chronic hypertension, pulmonary edema, weak or irregular heart action, cyanosis, pallor and an unbalanced thermo-regulative center suggest hazards which must be accorded greatest respect. A pulse rate over 150, respirations of 40 or over, a systolic pressure of 95 or less, and a blood urea of 70 or over, similarly demand caution. On hot, humid days the danger from heat exhaustion must not be disregarded, although this danger is not so great as where external heat is used as a means of inducing fever. Areas of skin anesthesia must ever be protected against excess heating. Of course, fever therapy is strictly a hospital procedure. It can by no stretch of the imagination be conceived as an office treatment.

In an editorial of the *Journal of the American Medical Association*, the present status of fever therapy was tersely summed up in the following paragraph: "During the past two years, interest in the production of fever by physical means has greatly increased. Since the gravity of the procedure cannot be overestimated, the administration of fever therapy should be in the hands of a competent, well trained organization. The personnel should include at least one qualified physician who remains in attendance throughout the treatment, of a skilled nurse-technician who has had special training in the field to administer the treatments. Physicians intending to use this therapeutic measure should select patients with as much discrimination as they use in determining those who are to undergo major surgical operations. Raising of the body temperature to 105 and 106 F. and maintaining it at that temperature for several hours is a most serious procedure, requiring the utmost vigilance on the part of the attendants for the safety of the patient."

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The Treatment of Pneumonia in Children with Sulfapyridine*

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LOBAR pneumonia in infants and young children frequently follows an infection of the upper respiratory tract. It often begins suddenly, perhaps with a convulsion. The first evidence of illness may be a very flushed face, listlessness, drowsiness and lack of desire to nurse or play. The infant especially is flushed and prostrated. Breathing is rapid, often with grunting sounds. The temperature rises to high levels and pulse rate and respiration rate rise in proportion. There is often no cough and sputum is rarely seen, since it is usually swallowed. The diagnosis by clinical evidence alone may be difficult. The causative organism is the pneumococcus.

Atypical or bronchopneumonia is far more common in infants than in older children. The disease is usually secondary to bronchitis or to various contagious diseases. It occurs in malnourished or in weak infants. It is often caused by the aspiration of bacteria laden secretions. The clinical findings are variable and vague. The onset is gradual and may merge with the primary condition. The fever rises gradually and is irregular. It is seldom as high as in the lobar form. The pulse rate and respiration are rapid and become feeble in severe cases. Cough appears, increases and is productive of thin or thick purulent sputum which is usually swallowed. Physical examination of the chest may only reveal course râles in both lungs. The bronchopneumonia is caused in 80 per cent of cases by pneumococci in pure form or mixed with other bacteria. It is therefore relatively unimportant to determine whether the pneumonia assumes the lobar or atypical form. It is of far more importance to determine the species and type of the causative organism in order to institute specific treatment promptly if it is necessary. About two-thirds of the pneumonias among infants and three-fourths of those among children are caused by the first eight types and XIV and XIX.

The use of specific sera for the treatment of pneumococcic pneumonias in infants and children gives good results. Tests for sensitivity to horse or rabbit serum must be performed as in adults. The recommended dosage for infants is from 300 to 800 units per pound (600 to 1600 units per kilogram) of body weight, preferably the larger amounts. In children use 500 to 1000 units per pound (1000 to 2000 units per kilogram) of body weight injected intravenously in three or four doses in a 24 hour period.

There are, however, disadvantages in connection with serum therapy. Its use requires careful typing of the infecting organisms. This procedure is not available to all physicians. Errors in typing may occur. The wrong serum means no results. More than one type of the pneumococcus may infect the child, and these multiple bacterial infections are not taken care of by one specific serum. The serum is injected intravenously and can very easily produce serum sickness. Finally, the serum is too expensive for patients in many communities.

Chemotherapy has, therefore, replaced in part the specific treatment of pneumonia with anti-pneumococcus serum. In fact the new drug called sulfapyridine has been found to be so effective in pneumococcic infections, that it is now referred to as a specific agent. It is a white crystalline powder which is relatively insoluble in water. The drug can only be administered orally. It is now supplied in capsules and tablets. It is absorbed fairly rapidly from the gastro-intestinal tract, although not in such constant amounts as sulfanilamide. Within a short time after administration, sulfapyridine may be detected in the blood by means of a test in which it is transformed into a colored dye substance. This is then compared with known standards prepared from pure sulfapyridine. The drug has been used the past year at the Minneapolis General Hospital for the treatment of many of the pneumonias among infants and children. During this period interesting observations have been made. The first thing that was encountered was the lack of any definite information concerning dosage. There were no hard and fast rules with regard to the amount of sulfapyridine to be administered to children. It was known, however, that the drug should be employed early in the disease, that a relatively large amount of the drug should be administered within the shortest possible period of time, and that a satisfactory maintenance dose must be given.

Barnett and his co-workers[1] recommended the following doses with the treatment to be continued for five days.

Age	1 to 3 months	6 mos. to 1 year	2 years	5 years	12 years
Dosage	0.15 Gm. every 4 hrs.	0.3 Gm. every 4 hrs.	0.3 Gm. every 3 hrs.	0.6 Gm. every 4 hrs.	0.9 Gm. every 4 hrs.

Thirty-four cases with proven pneumococcic pneumonia were treated employing this dosage schedule. The response was very good in that a crisis or a marked fall in the temperature was easily produced. Nausea and vomiting occurred in a few of the children during the first day or two of the administration of the sulfapyridine. However, if nausea and vomiting prohibited retention of the drug, the observation was made that this could in some instances be prevented or alleviated by certain expedients which vary in different individuals. In some children, the drug was better tolerated if the capsules were opened or the tablets were pulverized and the powder suspended in fruit juice, milk or malted

*Presented before the physicians attending the Postgraduate Lectures in Pediatrics in North Dakota, October, 1939.
†From the Department of Pediatrics of the University of Minnesota.

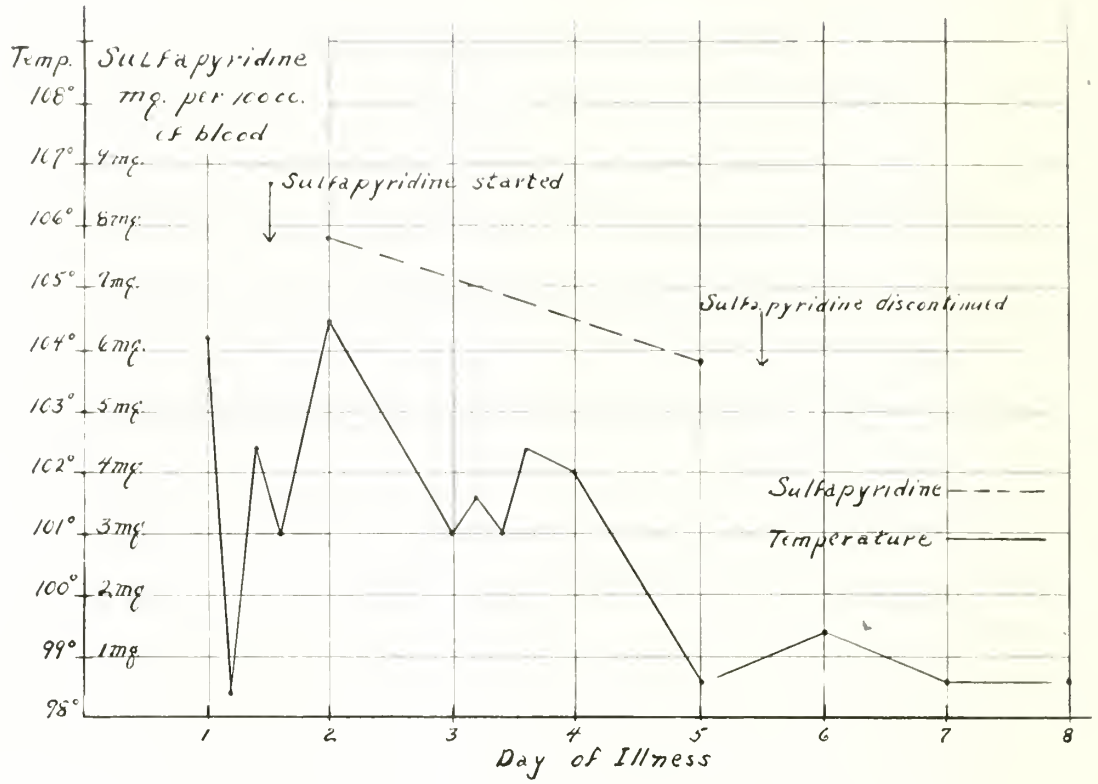

Chart 1. Response to sulfapyridine in a 17 month old child ill with pneumococci bronchopneumonia.

milk. Occasionally these liquids were not very helpful, and other foods such as flavored gelatin, sweetened fruit sauces, mashed bananas, simple desserts or cereals with plenty of sugar had to be employed. Most of the children took the sulfapyridine very well along with the regular food of their meals. If food was already in the stomach, the drug caused little vomiting.

Litter and his co-workers[2] have found the following prescription to be very effective in disguising the chalky taste of the drug. This has been of definite value in its administration, especially to small children.

Sulfapyridine	8.0 grams
Acacia Pulv.	10.0 grams
Syrup pruni virginianae	90.0 grams
Aquae dest. q.s. ad	120.0 grams

Shake well — 2 teaspoonfuls contain 0.5 gram or 7½ grains of sulfapyridine. Dosage can be regulated accordingly.

During the middle of the year, the dosage schedule was modified to make it more practical for the physicians in charge of the cases. Larger initial doses were instituted. These were to be continued for 24 to 48 hours depending on the appearance of the crisis. Then smaller amounts of the sulfapyridine were employed for a period of three to five days. Up to the present time 31 children with pneumococcic pneumonia have been treated by this method. The drug has been well tolerated, there being only a few cases in which vomiting interrupted the dosage schedule. The results have been most satisfactory. The duration of the pneumonia has been consistently shortened and complications from the disease appear to have been reduced although definite conclusions cannot be made until clinical studies have been conducted over a period of two or more years. The new schedule of sulfapyridine dosages for infants and children is as follows:

Age	Dose	Capsules	Tablets	Interval	Total 24 Hrs.
Below 6 mo.	2 grs.	½	¼	3 hrs.	15-16 grs.
6 mo. - 1 yr.	3¼ grs.	1	½	3 hrs.	26 grs.
1 - 3 yrs. (incl.)	7½ grs.	2	1	4 hrs.	45 grs.
4 - 6 yrs. (incl.)	7½ grs.	2	1	3 hrs.	60 grs.
7 - 9 yrs. (incl.)	10 - 11 grs.	3	1½	3 hrs.	86 grs.
10 - 12 yrs. (incl.)	15 grs.	4	2	3 hrs.	120 grs.

One capsule equals 0.25 gram or 3¼ grains. One tablet equals 0.5 gram or 7½ grains. Dosages calculated on 1½ grains per pound of body weight each 24 hours.

Give above doses for 24 to 48 hours. Then reduce doses by one-third for next 3 to 5 days. In severe cases, try total 24 hour dose at once on admission.

Blood sulfapyridine determinations were done on many but not all the children of the first group. However, the patients of the second group all had these determinations. Great variations were found. The majority of the children had from 6 to 9 mg. of the drug per 100 cc. of blood. This level always led to a prompt crisis which is illustrated in charts 1 and 2.

The 65 infants and children who received the sulfapyridine had remarkedly few complications from the drug. There has been very little cyanosis. A few children had hematuria of short duration. Two patients became extremely restless and delirious. One child had a rather marked fall in the polymorphonuclear cells in the blood. This responded, however, satisfactorily to blood tranfusions. Complications have been so few in

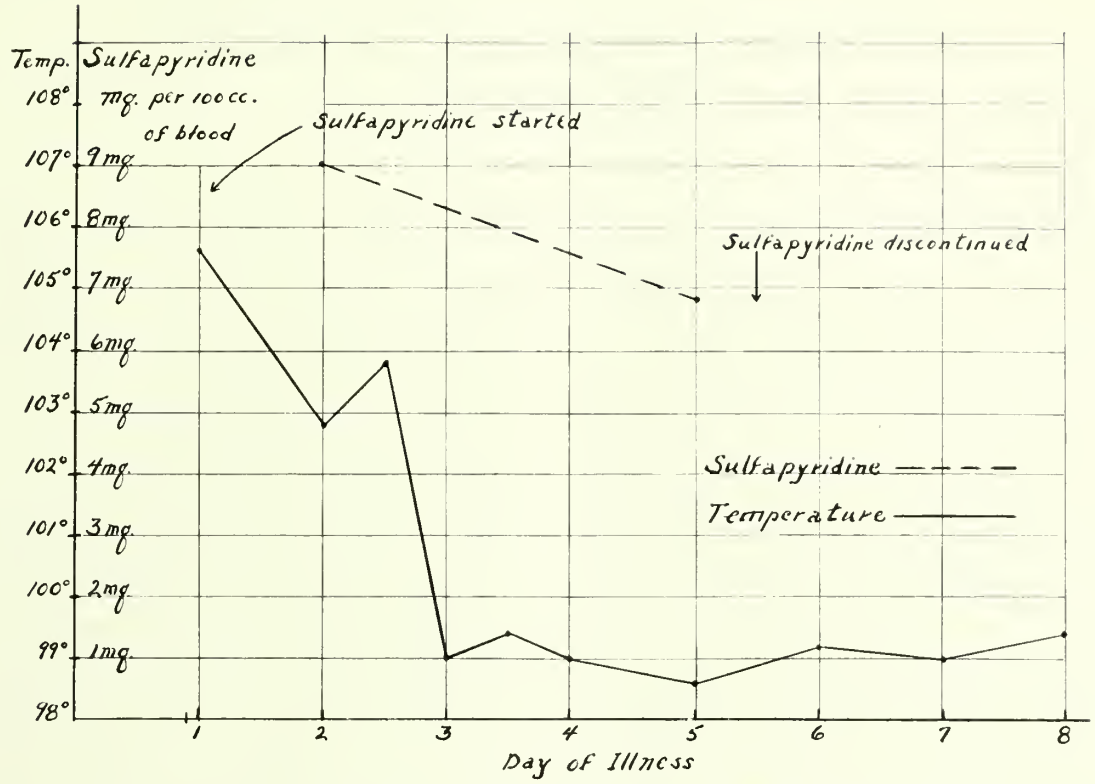

Chart 2. Response to sulfapyridine in a 3 year old child very ill with pneumococci lobar pneumonia.

number that one does not hesitate to recommend sulfapyridine for the treatment of pneumonias in infants and children. For the older children among whom many pneumonias are due to the pneumococcus, the drug is of great value in spite of the fact that in these children the disease may be a mild disorder with a much lower incidence of bacteremia and deaths than in adults. Charles Hendee Smith of the Children's Medical Service of Bellevue Hospital, New York, has stated that even though the death rate in children may not be greatly affected, since it is already low, the shortening of the disease and the avoidance of complications justify the use of the drug.

Reference has not been made to sodium sulfapyridine which is a soluble form of the drug permitting intravenous administration. The solution is quite irritating to subcutaneous tissue and it must be used with great care. Research laboratories are now working with a less toxic preparation. A future communication will contain more detailed observations with statistical data concerning sulfapyridine and the various modes of administration.

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Prevalence of Vitamin A Deficiencies

Preliminary Report

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THE purpose of my investigation was to find out the prevalence of vitamin A deficiencies during the winter months among the underprivileged school children and also to test out the efficiency of various methods of correcting these deficiencies.

In spite of considerable publicity given the vitamins, a recent survey in Minneapolis shows that a surprisingly large percentage of our inhabitants are still vitamin deficient, at least in vitamin A. In a series of one hundred and fifty refraction cases taken at random from a children's refraction clinic, maintained by the Minneapolis Board of Education for the benefit of underprivileged children, I found thirty-two children (21 per cent) deficient in vitamin A as shown by bio-photometer tests. Jeans,[1] in a survey of children in Iowa City, found 19 per cent subnormal and 5 per cent borderline.

The bio-photometer test is a very simple one which is based on the bleaching of the visual purple of the retinal rod cells for a measured period of time and then timing the rapidity of its regeneration. Visual purple is practically pure vitamin A. In controlled cases it has been found that the visual purple regeneration is retarded in proportion to the deficiency.

When the vitamin A deficiency has become sufficiently pronounced, certain symptoms may develop. The most notable of these is night blindness. These patients notice that their vision is greatly lessened in subdued light. They find it particularly difficult and dangerous to drive automobiles at night because of their poor recovery of vision after being blinded by headlight glare.

Symptoms associated with epithelial metaphasia such as xerosis, hyperkeratosis, keratomalacia and xeroplithalmia may develop. R. E. Wright[2] says that keratomalacia causes more blindness in parts of India than opthalmia neonatorum, syphilis or trachoma. He found crude cod liver oil the most effective therapeutic agent. Also must be mentioned the increased susceptibility to various infections such as head colds, sinus infections, staphylococcus invasion and appendicitis. Here it is interesting to note that two cases of acute appendicitis developed in my small group of deficiency cases within a period of one month.

Each patient in the deficiency group was retested at a later date (about one month) before any treatment was instituted. Fifteen percent of these had returned to normal without any treatment. No mention was made to these patients of the purpose of the test or the findings. This seems to indicate that these deficiencies are quite variable in character. Seasonal influence is a marked factor. My tests were made in January and February, a time when milk and milk products contain the smallest amount of vitamin A, sunshine is scarce and fresh vegetables are expensive. Another potent factor in the frequency of this condition is the elimination of butter, cream and other vitamin A foods in the various reducing diets. It is evident that patients wishing to reduce their weight should do so under the supervision of a physician and these deficiencies would not occur. Defective absorption of vitamin A, even with adequate diet, occurred in one of my cases. Jeghers,[3] in making a study of medical students in Boston, found 35 per cent of them were below normal standards in vitamin A, and 12 per cent had clinical manifestations. Frandsen[4] found varying degrees of slight hemeralopia in forty-six out of sixty-five healthy school children. Friderichsen and Edmund,[5] in Denmark, found that infants have little or no vitamin A reserve until they begin to eat vegetables. They found infants could be made acutely deficient in twenty-four hours simply by placing them on a water diet. Vitamin A deficiencies have been studied very carefully in Denmark because of their great prevalence during and following the world war. This was largely brought about by the exportation of butter and cheese because of high prices and a home consumption of margarine. This has been lessened to some extent now by the vitaminization of the margarine. Friderichsen and Edmund[5] also found that one form of vitamin A helped some patients and not others. Some of their patients were given mashed carrots and carrot juice and no improvement was noted. When these patients were given dried spinach, rapid improvement resulted. They were unable to explain why this should be true.

In my series, seven children were injected subcutaneously with 20,000 International unit ampules of fish liver oils. Of these seven children, five returned to a normal vitamin A level within thirty minutes after injection. The other two showed a very marked improvement within thirty minutes. These children were given dietary instruction and were told to take fish liver oil in orange juice daily. A bio-photometer test two weeks later showed these patients to be normal.

Of the twenty-five remaining children, eleven were given vitamin A tablets and fourteen were given fish liver oil in orange juice. All were given suitable dietary instructions. These twenty-five children were tested again after two weeks treatment and all were found to be normal.

Besides this series of school children, a group of seven teachers were tested. Three of these were subnormal. Of these three, one was on a reducing diet and responded rapidly to adequate diet and vitamin A tablets. The other two did not respond to subcutaneous injections, vitamin A tablets or fish liver oil. One finally responded to prolonged treatment with carotene in oil. The other one, I was unable to improve with any treatment tried. She gave a history of several members of the family with night blindness.

CONCLUSIONS

1. Vitamin A deficiency is still a very prevalent and important health factor.
2. Diets for weight control should be supervised by a physician.
3. Treatment by adequate diet supplemented by vitamin A products should be checked by bio-photometer readings to note progress. If not satisfactory, the supplemental treatment should be changed.
4. The vitamin level may be raised by injections of fish liver oil.

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(Bio-photometer furnished through courtesy of A. W. Hubbard.)

Book Reviews

Introduction to Physiological and Pathological Chemistry, by L. EARLE ARNOW, Ph.D., Instructor in Physiological Chemistry, University of Minnesota Medical School. 555 pages with index; illustration. St. Louis: C. V. Mosby Co. 1939.

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This book is written with remarkable clarity. Intended as a textbook for students, it treats of the fundamentals of inorganic, organic, pathological and physiological chemistry with the simplicity of excellence. The author states that the manuscript of the volume was read by two persons completely unfamiliar with chemistry and that anything which did not seem clear to them was changed to make it clear.

The emphasis in this volume has been placed upon physiological chemistry, with a host of examples drawn from topics which are of interest in clinical medicine. Chapters on hormones, vitamins and nutrition are included. Everything is brought strictly up-to-date in this first edition of Dr. ARNOW's work. For this reason, even the physician may find it a valuable book for an organized review of topics to which scattered references in periodical medical literature are frequently found.

The book is written with special reference to the needs of hospitals and nursing schools and is an outgrowth of Dr. ARNOW's work in teaching student nurses at the University of Minnesota during the past five years. An interesting introductory chapter has been written by KATHERINE J. DENSFORD, director of the University of Minnesota School of Nursing.

The Management of Fractures and Dislocations, The Staff of the Fracture Service of the Massachusetts General Hospital, Boston, under the general editorship of PHILIP D. WILSON, M.D., surgeon-in-chief, Hospital for Ruptured and Crippled, New York City; 1036 pages, 1419 illustrations with index; Philadelphia: J. B. Lippincott Co.: 1938.

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Because of our modern motorcars, the toll of accidents in this country continues to mount. Therefore it behooves all physicians and surgeons to be thoroughly equipped in order to treat fractures and dislocations. Because this is a mechanical age and because fractures and dislocations involve the practical application of mechanics, a great variety of appliances and methods have been developed. This present work is based upon the actual study of cases and the analysis of the results of treatment. The end results of the cases treated extend from the hospital stay to many years after discharge. The present volume comprises the study of a group of approximately 3,985 patients with 4,395 fractures and dislocations, all treated at the Fracture Service of the Massachusetts General Hospital through the years 1923-1930 inclusive. The authors hope that this volume will be regarded as a collection of source material for the use of authors and students who are investigating certain aspects of fractures and dislocations. The original source material which comprises this book is divided among its various authors and each is held responsible for the review of the subject which he had always taught and in which he was particularly competent. This volume may be considered a challenge to others to present original material in treatise form. For an indefinite future, it should remain as a source of original material and case reports.

Cancer, Its Diagnosis and Treatment, by MAX CUTLER, M.D., Associate in Surgery, Northwestern University Medical School, and FRANK BUSCHKE, M.D., Assistant Roentgenologist, Chicago Tumor Institute, assisted by SIMEON T. CANTRILL, M.D., Director, Tumor Institute, Swedish Hospital, Seattle; 757 pages; Philadelphia: W. B. Saunders Co.: 1938. Price, $10.00 net.

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The authors are very definite in the statement that the purpose of this volume is to present the essential clinical features of the more common forms of cancer. In the preparation of *Cancer, Its Diagnosis and Treatment,* the authors were rewarded in finding that many practical clinical problems generally regarded as debatable can be made the subjects of valid conclusions. On the general problem of cancer, the perplexed physician and the bewildered patient will find in this volume a means of separating sound clinical evidence from confusing data. Highly specialized forms of cancer and those of the central nervous system have been left to already existing treatises. Also the pathological aspects of neoplastic disease are discussed only when they have a bearing on the clinical management of the condition presented. The histogenesis and detailed morphology of cancer are not discussed. The authors are united in presenting this volume to the general practitioner and the specialist, both of whom participate equally in seeing, treating and diagnosing cancer. The ultimate hope is that this volume will present a clear understanding of the general problem of cancer and in so doing lead to a reduction in mortality rates from this disease.

Cancer, with Special Reference to Cancer of the Breast, by R. J. BEHAN, M.D., Dr.Med. (Berlin), F.A.S.C., co-founder and formerly director of the Cancer Department of the Pittsburgh Skin and Cancer Foundation, Pittsburgh, Pa.; 844 pages, profusely illustrated; St. Louis: The C. V. Mosby Company, 1938. Cloth, price $10.00.

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This book was originally written as a treatise on carcinoma of the breast but since the author felt that this condition could not be properly understood without more knowledge of cancer in general, he included a detailed description of the many phases of cancer activity, stressing especially cancer of the breast.

Chapter for chapter the author describes in detail the general considerations, etiology, pathology, etc., of carcinoma of the breast. One chapter is devoted to the present ideas on biopsy. The operative management is presented in detail.

Radium and X-ray therapy as a postoperative measure is also given in detail with extensive quotations from literature. The author has credited all authorities whom he has quoted and this has made for an excellent extensive bibliography.

The primary purpose of the author was to write a book for the clinician who wanted to enlarge his knowledge of the cancer problem, a purpose which this reviewer believes has been accomplished.

The
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Best Wishes

May every reader of the Journal-Lancet enjoy a happy New Year. May you have work to do and strength with which to do it. May the enthusiasm of youth still inspire you with its fervent flame.

In your striving, may it be for the good of humanity; and may you be happy in the profession you have chosen. In your going about doing good, may you with years of experience acquire wisdom, tolerance and forbearance for others, and a cheerful disposition. It takes much of this to dissipate the gloom that each of us is prone to encounter on daily rounds.

And, if by chance you have reached the age when you can no longer be active, may you sit in contentment under your vine and fig tree, enjoying a well-deserved rest with pleasant memories.

A. E. H.

VACCINATION AND TUBERCULIN TEST

During the summer of 1939 there appeared a letter which apparently was widely distributed over the state of Minnesota. The letterhead bore the following: "Office of the President, H. E. Soule, National Health Foundation of Minneapolis, 341 Loeb Arcade, Minneapolis. The subject of the letter was "Wants Square Deal for 4-H Fair Contestants." The first two paragraphs are as follows:

"The National Health Foundation of Minneapolis calls attention to a 'NEWS RELEASE' sent out August 4th by the Minnesota Public Health Association which contains a clearly implied threat that should be a challenge to everyone who believes in a square deal for the splendid boys and girls of our 4-H clubs in deciding their State Fair contests for 'Health Champion.' The Minnesota Public Health Association statement was as follows:

" 'Failure to have a tuberculin test or vaccination have prevented boys and girls in the past from being selected health champions of Minnesota.' The implication is clear that 4-H boys and girls competing in the Minnesota State Fair health contest this year who have not been vaccinated or tuberculin tested will be discriminated against and have less show to win, regardless of their physical perfection, than will those less physically fit who have been vaccinated and tuberculin tested."

The writer then asks, "How much longer must the parents of children who do not believe in processes of this kind continue to have their physically superior children handicapped in 4-H health contests by such arbitrary rules of medical dictators who when they cannot legally force their procedures on young people resort to this form of coercion to put them over?"

One wonders whether Mr. Soule knows that long ago it was observed that there was no tuberculosis among the cattle on the Island of Guernsey but some of the cattle were exhibited in England, where the disease was prevalent. Here they contracted it and after they were returned to Guernsy they spread it among other cattle. One wonders whether Mr. Soule knows that thirty years ago Dr. A. D. Melvin, Chief of the Bureau of Animal Industry said: "In my judgment the time has arrived when prizes should be given only to animals that are in a healthy condition, and the presence of tuberculosis or other contagious disease should constitute a disqualification. In fact, animals should not be admitted to such exhibitions at all unless their health is assured."

Two years later, in 1911, Dr. Melvin said that the efforts on the part of the Bureau to admit to public exhibitions only animals free from tuberculosis had been recognized by the officials of the Utah State Fair in 1910 when they ruled that only cattle free from tuberculosis, as demonstrated by the tuberculin test, be exhibited at the fair. Dr. Melvin expressed the hope that the managers of other large exhibitions would follow a similar course and said that it is unreasonable and unfair that premiums should be awarded to animals infected with a contagious disease. His desires have been realized for today there is no state fair or no livestock show where owners are permitted to enter cattle that have not been tested with tuberculin and found free from tuberculosis.

The boys and girls of the 4-H clubs, together with their leader, Mr. T. A. Erickson, and the fair board members and officials are cognizant of the fact that all cattle exhibited this year had been tested with tuberculin and found free from the disease.

The Minnesota Public Health Association, physicians, nurses, and all other true health workers are simply advocating that we do for Minnesota girls and boys by way of protecting their health as much as we have done for our calves. The only just criticism is that we are thirty years behind the veterinarian with the universal use of the tuberculin test.

Readers of the JOURNAL-LANCET can readily obtain expert information concerning the tuberculin test in animals from Dr. C. P. Fitch, Chief of the Division of Veterinary Medicine, of the University of Minnesota, Dr. Charles E. Cotton, Secretary of the Minnesota State Live Stock Sanitary Board, and expert information on the tuberculin test in man can be obtained from Dr. Harold S. Diehl, Dean of the Medical School of the University of Minnesota.

J. A. M.

PREVENTIVE ALLERGY

Allergy is a subject gaining more and more of a foothold in the lay literature. At the same time, the busy practitioner wonders if there is anything tucked away in the medical journals that will help him solve the mysteries of allergic diseases. Much research, laboratory and clinical, is being done. However, there have recently been no startling discoveries. The potassium chloride therapy should still be confined to the experimental field.

In children a new idea has arisen. It is referred to as preventive allergy. Although only a few years old, this form of treatment of allergic disorders in children is gaining ground steadily. The majority of investigators definitely feel that heredity plays an important role in preparing an individual for clinical manifestations. A few physicians have at times disagreed. Nevertheless, working on the theory that the more allergy in the family, the greater the tendency for the development of allergic diseases in the child, the more common, potent allergens or excitants should not be introduced into the infant's diet or the child's environment when there is a positive history of allergy. Why start giving the infant of a strongly allergic mother, wheat cereal? Many times this marks the onset of eczema. Other cereal preparations made from rye or barley should first be used. Why insist on eggs in diet? The infant or young child may become very allergic to them. Why permit a dog as a pet for a child with an allergic background? The cases are many, not few, in which sensitivity to an animal has developed after a period of only one or two years of exposure. This may mark the onset of asthma.

This new plan called preventive allergy is a good one as long as there is no sure cure therapy for allergy. It deserves attention; let us give it some.

A. V. S.

Societies

TRANSACTIONS OF THE MINNEAPOLIS CLINICAL CLUB

Stated Meeting
Held Thursday, October 12, 1939
The President, James K. Anderson, M.D., in the Chair

MYOGELOSES

ROBERT P. CARON, M.D.
MINNEAPOLIS, MINNESOTA

Pain presents an appeal for investigation and relief. There is one type of pain which in itself is very troublesome. It is not severe, but if not allayed leads to chronicity. A vicious circle of pain, muscle spasm, postural deficiency, disability and deformity often arises. A good part of this picture is functional and depends largely upon the underlying painful state. This recalls Charcot's early hypothesis of the central fixation of a pain idea as a factual interpretation of pain. Fracture of the synapse may result in cure or relief of symptoms.

The underlying painful state in regard to somatic pain may be due to irritated palpable nodules called myogeloses. These nodules vary from the size of a pea to a hazelnut and are usually rounded or oblong on palpation. They show the consistency of lipomata or fibromata. These tender areas may cause widely diffused pain. Although the pain complained of may radiate widely, the most likely locations of the nodules are the occipital and trapezius areas, causing stiffness of the neck, headache or radiating pain up the back of the scalp via the posterior auricular or occipital nerves.

The deposits may be along the erector spinae muscles and especially over the posterior crests of the ilium. The latter locations especially are of importance. Somatic pain often accompanies fibromatous nodules in the sacro-iliac region. Pain may radiate widely from deposits in this area, but the nodules may be found anywhere from the suboccipital region to the hamstrings and in the internal tissues of the knees in people with an adipose tendency.

The myogeloses can be the result of inflammatory overgrowth of white fibrous tissue of the fascia, or of fibrous insertion of the muscles and aponeurosis with local serous effusion. They may be due to trauma, possibly focal or general infection, or may be a natural deposit without symptoms. Acute trauma most often initiates their sensitivity. The microscopic picture consists of muscle and fibrous tissue.

The differential diagnosis of nodule formation in the areas mentioned involves a consideration of the following: Cysts of all kinds, especially of the sebaceous variety, whether infected or noninfected; glands—inflammatory, benign or malignant; lipoma, fibroma, adiposa dolorosa, hematoma, varices and perineuritis post-traumatic.

Many surgeons and most physicians are surprised that these small nodules should be taken up as the object of research and study. However, once their attention has been focused upon the dynamic role which may be played by these nodules in their relationship to localized pain and allied discomfort, they become converted to their importance and become "nodular minded" when a call of pain presents itself over the back of the body from the suboccipital area to below the gluteal region.

It is admitted that if the area of pain corresponds with the anatomical distribution of one of the spinal nerve roots, a careful neurological examination should be made in order to exclude some condition exercising pressure or irritation within or immediately external to the spinal cord. Such root pains are usually aggravated by coughing, sneezing, change of posture, etc., and are usually accompanied by symptoms of tingling, hyperaesthesia and other positive findings. Root pains, accompanied by sensory or motor paralysis with change of reflex response point to compression in the cord itself. Herpes zoster and other allied conditions must also be considered. However, such entities are much less common than the finding of sensitive nodules, radiating diffuse areas of pain accompanied by muscle spasm.

Treatment of the myogeloses may be by local injection, physiotherapy or surgical removal. The local injection method is overwhelmingly satisfactory. The site of maximum tenderness is determined by inspection, exercise and deep palpation. The patient is best examined standing with the back in slight lordosis. If the area examined is flexed forward, satisfactory palpation of the loose nodules is more difficult. There may be more than one area of preponderant tenderness. Having determined the exact point of tenderness, the solution is penetrated into the nodule, using about 3 to 5 cubic centimeters, thus distending the nodule and changing the local environment of the tumor itself. Ofttimes the simple distension alone causes a lasting relief. Usually the procedure is complemented by radiating fractional deposits of 5 to 10 cc. of the solution around the nodule.

The solutions used may vary. The weaker solution consists of 1 per cent novocaine without adrenalin, normal saline or distilled water. The stronger solutions are quinine urea hydrochloride, 1—600 dilution for widespread, deep and subcutaneous injection. One-half of one per cent quinine can be safely injected deep into the nodule itself. The strongest solution consists of 95 per cent alcohol. It has been claimed that novocaine solutions in oil cause a slower absorption of the novocaine. This is true for the fanlike infiltration around the nodule, but the injection of the oil solution with novocaine into the nodule proper has caused an increase of sensitivity in some cases, and I have abandoned using it for injection into the nodule proper.

If the nodule is persistently tender in spite of the injection of the weaker solution, the stronger solution is used, namely, 5 minims of 95 per cent alcohol deep into the nodule. In the widespread nodular formations, particularly in the sacro-iliac or lower back region, massive injections of 20 to 30 cc. of the weaker solution may be used to distend the area thoroughly and break up painful adhesions present. The injections can be repeated as often as necessary. Usually one to three injections suffice. Only rarely has it been necessary to excise the node.

CASE REPORTS

Case No. 1. A housewife, age 52 years, gave the following history. Intermittently for the past two years she had throbbing pain, which was severe at times, radiating from the back of the neck upward over the scalp. She had been treated with diet and sedatives and was told that the pain was due to high blood pressure, which was 170/100. The eye grounds were normal; a change of glasses offered no relief. Physical examination revealed the hypertension and also the presence of three small nodules over the upper trapezius area. They were sensitive to pressure and radiated diffuse pain. The nodules were distended with 1 per cent novocaine, using 3 cc. in each. There was immediate relief. During August 1939, one year following the first injection, she reported that for the past few weeks there was a recurrence. The nodes were still present, they were about the same size and in the same location. They were injected again. A follow-up report, a week ago, revealed no recurrence of symptoms.

Case No. 2. This patient, a woman of 60 years, was referred by a neurologist who stated that she had a syndrome of posterior auricular neuralgia, of five years duration. The pain was severe and of a persistent nature. The case had been well worked up and many forms of therapy had been tried. He suggested a bilateral cervical block by use of quinine or any solution indicated. Several cervical injections were tried but the relief of symptoms was only transient. This was several years ago before my attention was focused on the importance of the significance of nodules when they are present in this location. One year ago this patient returned to me again and painful nodules were located and treated by the use of quinine, ½ of 1 per cent. Quinine, rather than novocaine, was used because she lives out of the city and there would not be an opportunity to re-inject on successive days should the novocaine not give the desired results. The relief of symptoms lasted six months. She returned and was re-injected. Her son was in the

city two weeks ago and stated that his mother was now very comfortable.

Time does not permit me to relate more case reports. However, a good many have responded to this form of treatment, especially those cases with nodules over the sacral and upper iliac areas. The nodes are more common in the lower back than in any other location.

Sensitive nodule formation was first called to my attention in 1934. The incident was a consultation with Dr. E. T. Evans in reference to a painful knee which was the result of repeated trauma to nodules on the internal aspect of the knee.

CONCLUSIONS

1. A careful history and examination, as always, leads to an evaluation of the causes and effect.
2. Conservative therapy is both diagnostic and palliative.
3. Myogelosis should be recognized as a syndrome, confirmed and treated conservatively prior to any consideration of radical therapy.

Discussion

Dr. RUSSELL W. MORSE: I would like to ask Dr. Caron to go a little more into detail about the pathology of these lesions.

Dr. J. C. DAVIS: Do they lie deep in the muscle or do they lie close to the surface?

Dr. H. B. SWEETSER, JR.: I would like to ask a question as to how big these myogeloses are and how common they are? How many have you seen and is it unusual or common?

Dr. DOUGLAS HEAD: Dr. Caron's group of cases has been extremely interesting to me because of the frequent complaint of aching in the back of the neck, seen especially in women. A similar syndrome has been described as acute and chronic fibrosis with or without tender nodules.

Dr. CHARLES MCKENZIE: Does this occur in men or only in women after the menopause? Occasionally women will have these nodules after menopause and occasionally it is amenable to treatment with estrin.

Dr. R. P. CARON: With reference to the pathology of myogeloses, I should like to show a slide of a nodule removed from the iliac crest region. It shows muscle, fibrous and areolar tissue. The section was made to determine the presence or absence of nerve fibrils. None were found in this specimen. The nodules may be the result of local or general infection but more often due to trauma. It is believed that trauma causes a local serous effusion into the aponeurosis with resulting acute distention which in turn radiates pain and spasm.

The myogeloses lie subcutaneously and are attached to the aponeurosis. They vary from the size of a pea to a hazelnut and on palpation elicit the consistency of fibromata. They are very common in patients complaining of myalgia and especially following acute trauma, such as back strains. I have seen and treated a considerable number.

Nodules which follow the wake of a general infection, such as rheumatic fever, are, I believe, of a different pattern. These nodules are found in most any location, and the point of tenderness cannot be extremely localized as in the case of the active myogeloses. I would not attempt injection, massage or excision of a nodule associated with a general infection such as rheumatism.

The nodules may occur in either sex. It has been my experience that most of the syndromes with reference to nodules in the trapezius area were found in women. Most of the nodules with symptoms in men were found along the iliac and sacroiliac areas.

PATHOLOGIC CHANGES IN THE HEART IN MYXEDEMA

(Inaugural Paper)

NATHANIEL H. LUFKIN, M.D.

(Abstract)

The gross and microscopic findings in the autopsy of a case of myxedema with heart failure were presented:

The patient had been treated for a number of years for heart failure, nephritis and anemia. During this period no specific thyroid medication had been given. The history and physical findings on admission were characteristically those of myxedema with cardiac decompensation. The existence of anemia was proved and marked alterations were found in the electrocardiogram. Death occurred before basal metabolism studies could be done.

At autopsy the thyroid gland weighed only 7 grams. Histologically it was scarcely recognizable. There was marked chronic passive congestion of the liver.

Special attention was given to the heart. It was slightly enlarged and greatly dilated in all its chambers, this change being more pronounced in the right ventricle. Histologically there was a moderate degree of fatty metamorphosis. In many areas the muscle fibers were spread apart as if by edema. In individual fibers there was definite swelling and perinuclear loss of staining quality.

The literature contains very few descriptions of careful histologic studies of the heart in myxedema with cardiac decompensation. Frequently the gross and microscopic picture is masked by the presence of severe disease of the coronary arteries. A few investigators have made careful studies of the heart muscle in experimental myxedema and cretinism.

The gross and microscopic picture of the heart in the present case is similar to that already noted in human cases and in experimental myxedema. These changes strikingly resemble those reported to occur in the hearts of beri-beri patients with cardiac decompensation.

Discussion

Dr. A. E. CARDLE: I feel this paper this evening has considerable significance in the fact that Dr. Lufkin is trying as one of the first to explain the pathologic findings in myxedema heart. The material in this condition is certainly not abundant and I feel that he has made the most of what he has to show. From a clinical standpoint, one point must always be remembered; that is, where we have evidence of heart enlargement on an unexplained basis it is a wise thing to remember to do a basal metabolism determination.

I hope that Dr. Lufkin continues with this work for it is a field which needs to be more thoroughly investigated.

Dr. DOUGLAS HEAD: This is a tremendously interesting case; and it is classical in the careful and painstaking manner which Dr. Lufkin has treated it. May I ask him the condition of the coronaries?

Dr. NATHANIEL LUFKIN: At the point of bifurcation of the descending branch of the left coronary artery an atheromatous nodule occluded the vessel to about one-half its normal caliber. This nodule extended also into one of the two principal rami of this vessel, occluding it considerably. The other ramus remained entirely normal. The circumflex branch of the left coronary artery and the right coronary artery were practically normal. There was no myocardial fibrosis nor were there any other lesions suggesting the influence of coronary sclerosis.

Dr. DOUGLAS HEAD: Experience shows that it is very rare indeed to find a failing heart from myxedema alone. Cardiac changes from the normal are frequently seen associated with hypothyroidism and myxedema, but the rarely failing myxedema heart almost always occurs in the older age groups where other factors, such as coronary disease, emphysema, dietary deficiencies, etc., are most apt to be manifest. In this case the coronary factor would seem to be extremely minor.

Dr. Lufkin has brought out, justifiably to my mind, the similarity of beri-beri and myxedema as to the clinical and pathological findings noted in the heart. From the electrocardiographic standpoint, for example, both conditions may be associated with low potential of the QRS and low or reversed T waves. It is interesting to speculate whether dietary deficiency may well be a common factor in the cardiac changes observed in both conditions.

Dr. R. S. YLVISAKER: I might mention that I have personally seen electrocardiograms on three persons with myxedema that I can recall now in which, in addition to the low potential, there was a prolongation of the PR interval which returned to normal on thyroid medication.

ERNEST R. ANDERSON, M.D., Secretary.

Minnesota State Board of Medical Examiners

Julian F. DuBois, M.D., Secretary
230 Lowry Medical Arts Bldg.
St. Paul, Minnesota

DOCKET OF CASES

Otter Tail County Woman Sentenced to Jail Term for Examining Eyes and Selling Glasses

Re. STATE OF MINNESOTA *vs.* MARY LOUISE PAULSEN

On September 22, 1939, Mary Louise Paulsen, 59 years of age, entered a plea of guilty to an information charging her with the crime of practicing healing without a basic science certificate. Following a statement of the facts in the case to the Court by Mr. Wm. P. Berghuis, County Attorney of Otter Tail County and Mr. Brist in behalf of the Minnesota State Board of Medical Examiners, the Honorable Anton Thompson, Judge of the District Court, sentenced Mrs. Paulsen to three months at hard labor in the Otter Tail County Jail. Mrs. Paulsen was arrested by Sheriff J. C. Henkes of Otter Tail County, on a warrant charging her with examining eyes and fitting glasses without being properly licensed. When taken before Justice Frank C. Barnes of Fergus Falls, Mrs. Paulsen waived a preliminary hearing and was held to the District Court under $500.00 bond, which she was unable to furnish. She stated that she desired to plead guilty with the foregoing result.

Upon being questioned by Judge Thompson, Mrs. Paulsen admitted that she had no training in the examination of eyes or the fitting of glasses, except for a period of one week at Chicago, Illinois, where she stated she received some instructions from an optometrist by the name of H. E. Baker. Mrs. Paulsen, at the time of her arrest, was living in a trailer at Leaf Lake about seven miles north of Henning. She would go from farm to farm examining eyes and fitting glasses. When she made a sale she sent the prescription to the Home Service Optical Company at 3737 Fremont St., Chicago, Illinois. Mrs. Paulsen stated that Baker was connected with this Company. Mrs. Paulsen received 30 per cent of the selling price of the glasses as her compensation. The glasses sold within a range of $4.00 to $16.00. She stated to the Court that she first came to Minnesota in 1929, on a visit and that she has resided in Otter Tail County for the past two years. She stated that her husband resided at Clear Lake, Iowa. Mrs. Paulsen has a previous conviction in 1937 in Otter Tail County for petit larceny.

Judge Thompson made it very clear to the defendant that the Court would not tolerate any such unlawful practices and emphasized the necessity of people having specialized training and a proper license if they are going to examine eyes and fit glasses. Mrs. Paulsen seemed quite crest-fallen at being sentenced to the County Jail, but the Court advised her that she should have considered that before she proceeded to violate the laws of the State of Minnesota. Judge Thompson told Mrs. Paulsen that after she had served 30 days and had refunded the money to those persons who had not yet received their glasses, and upon assuring the Court that she would absolutely refrain from practicing healing in any manner in the State of Minnesota, the Court would consider an application on her part to suspend the balance of her sentence.

The Minnesota State Board of Medical Examiners wishes to specifically mention the splendid coöperation received from Mr. Berghuis, County Attorney of Otter Tail County and Sheriff Henkes. Both of them assured the Medical Board that they do not want any unlicensed individuals practicing healing in Otter Tail County and that they will coöperate in every manner in such cases.

Spring Valley Woman Pays $100.00 Fine for Illegal Practice of Healing

Re. STATE OF MINNESOTA *vs.* ELIZABETH SCHULZ

On August 14, 1939, Elizabeth Schulz, 47 years of age, entered a plea of guilty before the Honorable Norman E. Peterson, Judge of the District Court, at Preston, Minnesota, to an information charging her with practicing healing without a basic science certificate. Following a statement of the facts to the Court, Judge Peterson sentenced Mrs. Schulz to pay a fine of $100.00 or to serve 30 days in the county jail of Fillmore County, in the event the fine was not paid. Mrs. Schulz promptly paid the fine.

Mrs. Schulz was arrested following the filing of a complaint against her by Mr. Briet on behalf of the Minnesota State Board of Medical Examiners on August 11, 1939. The investigation made by the Medical Board disclosed that Mrs. Schulz had been seeing numerous patients at her home in Spring Valley where she attempted to diagnose and treat their ailments. Mrs. Schulz would charge each patient 50c per call, and in addition to administering a sort of massage treatment, she would write out a prescription on the prescription blanks of the Sward-Kemp Drug Store at Spring Valley, Minnesota, for such drugs and medicines as she thought the patient should have. While Mrs. Schulz did not sign these prescriptions she had an understanding with Mr. E. B. Petersen, a part owner of the drug store, that they would be honored. Other equipment used by Mrs. Schulz, in her practice, consisted of a stethoscope, numerous dressing forceps and other similar articles.

Mrs. Schulz had a previous conviction for a similar offense in the same Court in 1934, and at that time was sentenced to three months in the Fillmore County Jail, but the sentence was suspended and she was placed on probation. At that time Mrs. Schulz was selling a mineral food. On January 10, 1934, one Russell Prinsen, 9 years of age, died of diabetes. Russell had been under Mrs. Schulz' care and was taking this mineral food. Mrs. Schulz promised Judge Peterson then that she would refrain from practicing healing in any manner in the future. However, she again resumed the practice which resulted in her arrest in the present case. When Mrs. Schulz was arraigned before Justice Fraser at Preston, Minnesota, on August 12, 1939, she waived her preliminary hearing and was held to the District Court. She indicated a desire to enter a plea of guilty and have the matter disposed of at once, which was done.

It is to be hoped that two prosecutions have convinced Mrs. Schulz that she cannot engage in the practice of healing in any manner in the State of Minnesota. The only training that Mrs. Schulz has ever received along these lines, is a short time as a student nurse some 25 years ago, at the State Hospital at Fergus Falls. Mrs. Schulz had in her possession at the time of her arrest, a diploma from the Weltmer Institute of Suggestive Therapeutics at Nevada, Missouri, which was dated July 28, 1933. This diploma purports to confer upon Mrs. Schulz the right to make practical application of Suggestive Therapeutics. She stated that she attended this school in the summer of 1933 for a period of four weeks and that the tuition fee was $50.00. Mrs. Schulz, and her lawyer, stated to the Court that Mrs. Schulz would absolutely refrain in the future from practicing healing in any way, shape or manner. The Medical Board feels that Mr. Petersen's connivance in the operation of this scheme by Mrs. Schulz, is not to his credit as a registered pharmacist and is a violation of the laws of this state. Mr. Petersen was also advised that any further violation of the medical laws of this state on his part, will result in the prompt filing of a complaint by this Board.

The State Board of Medical Examiners wishes to acknowledge the friendly and courteous coöperation of Mr. Clarence T. Perkins, County Attorney of Fillmore County, in the prosecution of this case.

News Items

The officers of the United States Chapter of the International College of Surgeons cordially invite all physicians and surgeons in good standing to their Fourth Assembly, to be held in Venice, Florida, February 11-14, 1940. There is no registration fee. For general information, please address Dr. Fred H. Albee, chairman, 57 West 57th St., New York City. For information about the presentation of scientific papers or exhibits, address Dr. Charles H. Arnold, Secretary of the Scientific Assembly, Terminal Building, Lincoln, Nebraska.

Dr. Gwendolyn Stewart, for the past eleven years junior woman physician at the Minnesota State School for Feebleminded, recently transferred her work to the Fort Wayne State School for Feebleminded at Fort Wayne, Indiana.

At a meeting of the Northwest District Medical Society, Number 11, held December 17 at Mobridge, South Dakota, the following officers were re-elected: Dr. G. A. Sarchet, Mobridge, president; Dr. W. A. George, Selby, vice-president; and Dr. C. L. Olson, McIntosh, secretary-treasurer.

Dr. J. A. Myers, Minneapolis, Minnesota, returned December 12 from Puerto Rico, where he was awarded the 1939 Gold Medal for his outstanding accomplishments in the field of tuberculosis. While there he lectured before the Puerto Rico Medical Society and the Tuberculosis Assoication of Puerto Rico.

Dr. Edward D. Churchill, Boston, Massachusetts, John Homans professor of surgery at the Harvard Medical School and chief of the West Surgical Service at the Massachusetts General Hospital, will give the seventh E. Starr Judd lecture at the University of Minnesota in the Medical Science Amphitheater on Thursday, March 14, 1940, at 8:15 P. M. The subject of Dr. Churchill's lecture is "Surgery of the Lungs." The late E. Starr Judd, an alumnus of the Medical School of the University of Minnesota, established this annual lectureship in surgery a few years before his death.

Dr. Maysil M. Williams, North Dakota state health officer, recently announced the appointment of Dr. Viola Russell as director of the division of child hygiene in the health department, succeeding Dr. August Orr, resigned. The appointment is effective January 1. Dr. Russell comes to Bismarck from Pierre, South Dakota, where she served for four years as director of child hygiene in South Dakota's health department.

Dr. L. G. Griffis was elected president of the medical staff at the Kalispell general hospital, Kalispell, Montana, at a meeting of the staff held at the hospital the latter part of November. Other officers elected for the ensuing year are Dr. E. P. Cockrell, vice-president, and Dr. F. B. Ross, secretary-treasurer.

On December 7, Dr. R. E. Weible, Fargo, North Dakota, addressed the Minneapolis Surgical Club in the rooms of the Hennepin County Medical society, Minneapolis. His subject was "Certain Malignant Tumors of the Intestines."

At a recent meeting of the Sixth District Medical society, Dr. Percy L. Owens of Bismarck, North Dakota, was elected president. Dr. Owens practiced for a number of years at Tower City before joining the staff of the Roan and Strauss clinic at Bismarck.

Dr. S. B. Seitz, Barnesville, Minesota, was elected president of the Clay-Becker Medical society to succeed Dr. C. W. Moberg of Detroit Lakes, Minnesota. Dr. G. G. Haight of Audubon was elected vice-president; Dr. H. L. Flancher, Lake Park, secretary-treasurer; Dr. Carl Simison of Barnesville, delegate to the state meeting next summer, and Dr. V. D. Thysell, Hawley, alternate.

Dr. N. F. Musachio, formerly of Eden Valley, Minnesota, has located in Milaca and will be associated with Dr. C. J. Henry.

Dr. A. D. Haskell of Alexandria, Minnesota, resumed his practice on December 4. He is being assisted by Dr. L. F. Wasson, who was formerly located at Chisago City, Minnesota.

The appointment of Dr. Anthony Triolo, Rapid City, South Dakota, as director of the division of maternal and child health, was announced recently by Dr. J. F. D. Cook, state superintendent of health. The appointment is effective January 1st.

At a meeting of the Red River Valley Medical society on December 15, Dr. Abraham Shedlov of Fosston, Minnesota, was elected president. Other officers elected were Dr. W. G. Paradis of Crookston, vice-president; Dr. C. L. Oppegard of Crookston, secretary-treasurer; Dr. J. F. Norman, Crookston, and Dr. H. M. Blegen of Warren, delegates to the convention of the Minnesota Medical association.

Dr. Frank E. Burch, St. Paul, Minnesota, sailed for China December 15th. He has been selected by the China medical board of the Rockefeller Foundation as visiting professor of ophthalmology at the Peiping Union Medical College in Peiping, China.

At a recent meeting of the St. Louis County Medical Society held in Duluth, Minnesota, Dr. B. F. Davis was named president-elect, and Dr. T. L. Chapman succeeded Dr. Gage Clement to the presidency. Others elected were: Dr. Roy F. Raiter, Cloquet, vice-president; Dr. Gordon C. MacRae, secretary-treasurer; Drs. R. J. Moe, D. W. Wheeler and Carl Kohlbry, advisory committee; Dr. J. R. Manley, delegate to state society for three years; Dr. L. A. Barney, delegate to state society for one year; Dr. P. S. Rudie, alternate, and Drs. R. S. Forbes, E. L. Tuohy and C. Jacobson, Chisholm, members of the judiciary committee for three years.

In honor of forty years of service, Dr. G. H. Stidworthy of Deerfield, South Dakota, was feted at a community banquet recently. He was presented with a silver trophy.

Dr. Joseph F. Borg was named president-elect of the Ramsey County Medical society at its annual meeting recently in St. Paul. Other officers named are Dr. F. E. B. Foley, vice-president, and Dr. J. Allen Wilson, re-elected secretary-treasurer.

At a recent meeting of the Minnesota Society of Internal Medicine, held in St. Paul, Dr. Russell M. Wilder of the Mayo Clinic, Rochester, was elected president. Dr. Wilder succeeds Dr. Moses Barron of Minneapolis. Other officers elected were Dr. Max Hoffman of St. Paul, vice-president, and Dr. Reuben Johnson of Minneapolis, secretary-treasurer.

Dr. F. G. Chermak, formerly of the West Duluth clinic and the Rood clinic, Hibbing, Minnesota, recently opened offices in International Falls, Minnesota.

Dr. F. F. Attix of Lewistown, Montana, attended a two-day meeting of the Western Surgical society in Los Angeles the early part of December.

The Board of County Commissioners recently awarded the contract as county physician for 1940 to Dr. A. A. Dodge of Kalispell, Montana.

Dr. Robert H. Monahan, who formerly practiced in Baudette, Minnesota, is now associated with Dr. B. F. Osburn in the Northern Minnesota Hospital at International Falls, Minnesota.

Dr. Harold Gregg of Butte, Montana, president of the Montana State Medical association, delivered a paper at a meeting of the Mount Powell Medical society held recently in Anaconda, Montana. The subject of Dr. Gregg's paper was "Recent Advances in Medicine."

Appointed by the board of administration of the Jamestown state hospital for the insane, Dr. A. M. Fisher, of Bismarck, North Dakota, has begun his term as superintendent to succeed Dr. F. Lorenzen.

Dr. Norman Sather of Fosston, Minnesota, recently opened offices in McIntosh, Minnesota. He has just completed a year's residency at Ancker hospital in St. Paul.

Dr. Herbert Carlson, formerly of the State Sanatorium at Ah-gwah-ching, is now located at Minot, North Dakota, where he is connected with the Northwest Clinic.

Dr. E. D. Hitchcock of Great Falls, Montana, recently returned from Chicago where he spent a month attending the Chicago Tumor institute as an associate staff member.

FORGER WANTED

In a communication from Herbert C. Kimberlin, M.D., of Trenton, Missouri, we received a description of a man who has been forging checks and passing them off to oculists. The man is about 5 feet 10 inches tall, weighs about 155 pounds, light sandy hair, blue eyes, smooth shaven with a ruddy complexion. He is about 49 years old. This man orders a pair of glasses, presenting a check, usually in the amount of $30. He tries to simulate a farmer and usually has a notation on the check indicating that it is in payment for corn, cows, chickens, etc. The name on the check to him is no doubt forged and there is no doubt his indorsement on the back of the check is forged. He writes in a very rough but plainly legible hand.

If you come in contact with this party or have any information regarding him, please notify the Sheriff of Grundy County, Trenton, Missouri, or Dr. Herbert C. Kimberlin, Trenton, Missouri.

Necrology

Dr. Charles T. Granger, 69, Rochester, Minnesota's famed "Country Doctor," died October 4, 1939. He had been in active practice in Rochester for 35 years and was also active in civic affairs, having served as alderman and mayor.

Dr. Andrew C. Kelly, formerly of Bozeman, Montana, died recently in Chicago.

Dr. Frederick H. Neher, 48, St. Paul, Minnesota, died December 9, 1939. He was chief surgeon for the Omaha railroad and staff surgeon of St. Joseph's, St. Luke's and Miller hospitals.

Dr. Carl Alfred Hjelle of Portland, North Dakota, 55, died September 11, 1939. He had been in active practice in Portland for 18 years. The following is a resolution adopted by the Traill-Steele District Medical Society at a meeting held October 24, 1939:

WHEREAS, Dr. Carl Alfred Hjelle departed this life at his home in Portland, North Dakota, on Monday, September 11, 1939, and,

WHEREAS, Dr. Hjelle had served as a faithful and efficient physician and surgeon in Traill County for a period of 23 years; and,

WHEREAS, because of his ability and uprightness, he had become endeared to and highly respected by the people of his community and his colleagues in the medical profession;

THEREFORE, BE IT RESOLVED, that the Traill-Steele District Medical Society of which the deceased was an old and faithful member, extends its profound sympathy to the widow of Dr. Carl Alfred Hjelle and to his daughter, in their deep bereavement; that this Resolution be spread upon the Secretary's record of this Society; and that the Secretary be directed to send a copy of this Resolution to the widow of Dr. Hjelle at Portland, North Dakota, and to the JOURNAL-LANCET, Minneapolis, official journal of the North Dakota State Medical Association.

Unanimously adopted by the members of the Traill-Steele District Medical Society.

SYVER VINJE, *Secretary.*

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The Diagnosis of Pneumonia*

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OUR methods and criterions for the diagnosis of pneumonia have changed within the past decade or two. Differentiation of acute pulmonary infection into bronchopneumonia and lobar pneumonia as customary since the earliest days of physical diagnosis is no longer sufficient to separate two rather distinctive types of clinical and anatomic reactions of the lungs to infection or other irritation. The term lobar pneumonia may still be retained, but only when it is applied to a clinical entity caused by pneumococci and characterized by a sudden onset with a chill, pain in the chest, cough, rusty sputum, high fever, consolidation of one or more lobes of the lung and rapid recovery after a number of days. Atypical pneumonia is a term suggested by Cole to be used for all acute pulmonary infections not conforming clinically to typical lobar pneumonia. The term bronchopneumonia is too inclusive to be applied since in the majority of cases of pneumonia regardless of the cause, the lungs and bronchi are both involved. In recent times the words pneumonitis and pulmonitis have gained favor for a form, local or diffuse acute pulmonary inflammation confined chiefly to the interstitial tissues or the framework, blood vessels, lymphatics and air tubes of the lungs, in contrast with the lesion resulting from an outpouring of exudate into the alveolar spaces and its eventual consolidation. These and many other terms describing the location of the pneumonia, its extent, its behavior and its anatomic characteristics were recommended from time to time, but most of them serve no useful purpose except to designate some forms of pneumonia whose cause is still unknown. They are often the source of endless controversy over unimportant details of physical signs and anatomic changes.

Now that pneumonia is known to be a composite disease including many clinical entities each caused by a specific infectious agent, new methods of classification and diagnosis are necessary. Etiologic methods of diagnosis are of great importance and must be used since specific therapy for a number of specific entities shortens the disease or aborts it and materially reduces the mortality rate. For these reasons and for the prevention and control of epidemics of certain pneumonias, etiologic diagnoses are now indispensable.

Classification

Many infectious agents able to invade the human body and cause disease, may attack the lungs and cause pneumonia. Classification would, therefore, seem to be exceedingly complicated. But as a matter of fact, the problem is actually simplified since it becomes possible to regard most pulmonary infections as specific diseases for many of which specific methods for prevention or cure have been discovered. For the rest the way is cleared for the future discovery of means for prevention and treatment. A list of recognized varieties of pneumonia is given in table 1.

From a practical point of view, comparatively few of many varieties listed occur often enough to be of importance in general practice. Most of those which do occur are caused by gram positive cocci such as pneumococci, streptococci and staphylococci. Fewer are caused by gram negative cocci, by bacilli, by filtrable viruses, by

*Presented in part before the Hennepin County Medical society, January 8, 1940.

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TABLE 1
List of Pneumonias Arranged on an Etiological Basis
(From: Reimann, H. A.: The Pneumonias, Saunders and Co., 1938)

I	II	III	IV
Specific forms of pneumonia	Specific forms of pneumonia as part of systemic disease.	Pneumonia secondary to acute and chronic diseases, mechanical causes, shock, senility, etc., caused by	Special forms of pneumonia not caused by infection.
Coccal	**Bacillary**	Mixed infection	Oil aspiration pneumonia
Pneumococcus lobar pneumonia	Tularemic pneumonia		Radiation pneumonitis
" atypical pneumonia	Brucella pneumonia		Chemical pneumonia
Streptococcus pneumonia	Typhoid pneumonia		Allergic pneumonia
Staphylococcus pneumonia	Colon bacillus pneumonia		
M. tetragenus pneumonia	Bac. dysentery pneumonia		
Meningococcus pneumonia	Diphtheria pneumonia		
M. catarrhalis pneumonia	Plague pneumonia		
Bacillary	Glanders pneumonia		
H. influenzae pneumonia	Rheumatic fever pneumonia		
H. pertussis pneumonia	Syphilitic pneumonia		
B. mucosus capsulatus pneumonia	**Rickettsial**		
B. pyocyaneous pneumonia	Typhus fever pneumonia		
M. tuberculosis pneumonia	Rocky Mountain spotted fever pneumonia		
B. anthracis pneumonia	**Protozoal**		
P. pestis pneumonia	Leishmania pneumonia		
P. tularensis pneumonia	Endamoeba histolytica pneumonia.		
Virus	**Metazoal**		
Influenza virus pneumonia	Ascaris pneumonia		
Psittacosis pneumonia	Strongyloides pneumonia		
Measles pneumonia	Ankylostoma pneumonia		
Vaccinia pneumonia	Paragonimus pneumonia		
Fungus			
Monilia pneumonia			
Torula pneumonia			
Coccidiodes pneumonia			

fungi and other microorganisms, and occasionally by physical or chemical means. The problem of diagnosis in perhaps one-third to one-half of all cases of pneumonia is complicated by the presence in addition of saprophytic bacteria which are habitually found in the nose and throat, particularly streptococcus viridans, streptococcus hemolyticus, pneumococci of the higher numbered types, cocci of the Neisseria group and diphtheroids. Many pneumonias are supposedly "primary" infections of the lung, but in reality some seemingly insignificant infection or injury often precedes the bacterial pneumonia by preparing the field for the invasion of bacteria. When pneumonia is "secondary" and follows other serious illnesses or conditions, the lungs are more often invaded by a mixture of bacteria of which one, a few, or all varieties present may be pathogenic, in which case exact bacteriologic etiologic diagnosis is impossible. (Table 1, column 3).

Forms of pneumonia often perplexing to the diagnostitian are those which occur during some systemic infectious disease like typhoid fever, tularemia, influenza, rheumatic fever and others. (Table 1, column 2). In many cases the pneumonia may be caused by the same agent responsible for the general disease, in some cases by bactria habitually found in the nose and throat acting as secondary invaders, and in others by a combination of the two. It is often impossible, therefore, to arrive at an accurate etiologic diagnosis of the pneumonia during life unless the causative agent is evident or some other characteristic features are present.

A number of unusual forms of pneumonia not caused by infectious agents must also be considered in diagnosis. Among these are oil aspiration pneumonia, radiation pneumonitis, chemical pneumonia and allergic pneumonia. (Table 1, column 4). Diagnosis in such cases is aided by the history of the disease and preceding occurrences.

Diagnosis of the More Common Forms of Pneumonia

Because of the recent developments in specific immune therapy and chemotherapy, etiologic diagnoses are more important than ever. If in the future some therapeutic agent is discovered to cure all pneumonias of infectious origin, it will, of course, not be so important to differentiate them. Perhaps some new chemical compound or some bactericidal enzyme like the one recently discovered by Dubos which destroys gram positive cocci of various kinds may be found. But until that time comes it is necessary to determine the causative organism in each case as accurately as possible.

In the diagnosis of pneumonia, promptness, speed and accuracy are of great importance. Since for certain entities so much depends upon early institution of specific treatment, the physician's first duty even before a careful history and examination are made, is to obtain a sample of sputum to discover the causative agent. The amount and physical properties of the sputum although rather characteristic in certain entities are not constant enough to be relied upon for diagnosis. The physician himself, if equipped with a bacteriologic laboratory, may undertake the task, but it is usually better to depend upon a properly trained bacteriologist for this purpose. Many cities and states have established laboratories for this purpose at strategically located centers to which samples of sputum may be sent for immediate bacteriologic study and report.

In pneumococcal pneumonia in particular, the Neufeld capsule-swelling test has provided a relatively simple, reliable and rapid aid in diagnosis. It is especially valuable when the more parasitic kinds of pneumococci of Types I, II, III, V, VII, VIII and XIV are involved. When pneumococci of these types are found in the sputum of a patient who has the symptoms and signs of typical lobar pneumonia, they are almost certainly the cause of the pneumonia, especially if they are present in the blood stream and in material sucked directly from the pneumonic area of the lung with an aspirating needle. Lung puncture incidentally has proved disappointing to many as a diagnostic aid. Apart from the slight degree of danger during the procedure, it is impossible always to direct it precisely into the area of inflammation, and in many cases the aspirated lung juice contains no bacteria. The procedure is used in certain rare cases in which sputum cannot be obtained for study, but most patients can and will raise sputum if requested to, or turned on the side or asked to cough. If it cannot be raised, the exudate may occasionally be obtained from the nose or throat with a swab or a laryngoscope. In small children and infants who swallow the sputum, material for study may be aspirated from the stomach with a soft rubber catheter. Blood cultures must be made routinely in every case before and after any form of specific therapy. The details of these tests are described in most modern standard laboratory manuals. One important point to emphasize is, that it is not necessary to await the development of signs of consolidation before pneumonia is diagnosed or before steps are taken to study the sputum. In many cases of pneumonia, consolidation may be delayed for several days or may not appear at all. When a patient has the early signs and symptoms of pneumonia, and raises sputum he should be regarded as an emergency case and promptly studied.

Later in the disease, especially in patients with an overwhelming infection, the type of infecting pneumococcus may be determined by testing the urine and the blood for the presence of the type specific polysaccharide capsular substance. If purulent complications such as empyema or meningitis develop, pneumococci for typing may also be obtained from the pus.

Diagnostic Difficulties

If in a case of supposed pneumococcal lobar pneumonia no pneumococci are found after repeated tests of the sputum and blood, some other disease should be suspected such as infarct of the lung, atelectasis, acute pleural effusion, acute tuberculous pneumonia, or acute pericarditis, each of which in the early stage may mimic lobar pneumonia. A careful history, physical and roentgenographic examination and later developments clarify the diagnosis.

Multiple Types. In certain cases of pneumonia, pneumococci of more than one type may be found in the sputum. The problem then to decide is whether only one type is operative, if more than one type is causing concurrent infection or whether invasion with one type is followed by another as a superinfection or consecutive infection. When more than one type is found in a case of typical lobar pneumonia it is reasonable to incriminate the type most frequently found according to the statistical studies of the relative incidence of the causative types. The matter is further discussed in the following paragraph. Further assistance is given if one type among others is predominant or present at each repeated examination of the sputum and, of course, if the same type is present in the blood or in the lung itself as determined by lung puncture. Actual multiple infections with pneumococci or with other bacteria may occur.

The Higher Numbered Types. Pneumococci of Types I, II, V, VII and VIII usually give rise to the clinical form of lobar pneumonia and are seldom found in the nasopharynx of normal persons unless they have been exposed to patients with pneumonia caused by these types. Their presence in the sputum during acute pulmonary disease is, therefore, highly significant. Pneumococci of other types may also cause lobar pneumonia; some of them quite often and some of them rarely, but they are often found as saprophytes in the oral secretions of healthy persons. Their presence in the sputum in pneumonia is, therefore, often perplexing. For example, a person who carries one or more of the higher numbered types of pneumococci habitually in the nasopharynx may develop pneumonia caused by some other infectious agent. Pneumococci in such cases may either be of no significance or they may become active later as secondary invaders because the resistance of the lung is lowered, so to speak, by the primary infection. The use of specific antipneumococcus therapy by serums or drugs then becomes a matter of judgment.

The problem arose in my own experience during the winter of 1938 and 1939 when a mild but widespread epidemic disease of the respiratory tract was present.[1] In a small proportion of cases, pneumonia developed, presumably caused by the same unknown virus responsible for the epidemic. These cases lasted from two to seventeen days and recovery occurred in all. In several patients, pneumococci of Types IV and XVIII were present in the sputum and sulfapyridine was given with no beneficial effect whatever. Type VIII pneumococci were found in the sputum of one physician with a mild attack of pneumonia who had treated a patient with Type VIII pneumococcus pneumonia ten days before. Type VIII antipneumococcus serum was given, but since no beneficial effect was observed it was assumed that the pneumococci present in his sputum played no part in the pneumonic process. On the other hand, a number of patients who had had symptoms of the mild infection of the respiratory tract mentioned, suddenly, during the course of their illness, became much worse, the leukocyte count rose and signs of consolidation in the lung appeared. Pneumococci of Types I, II, V, or VII were found in the sputum, and the patients were treated with sulfapyridine and specific antipneumococcus serum with prompt benefit.

It has been our general plan, not to give antipneumococcus serum or sulfapyridine to patients whose illness begins gradually as nasopharyngitis and gradually progresses into a localized or diffuse pneumonia with suppressed breath sounds and rales, and whose blood leuko-

cytes are normal in number, even though the sputum contains pneumococci of the higher numbered types. If pneumococci of Types I, II, III, V, VII, VIII or XIV are in the sputum, and if the mild disease suddenly becomes worse with the signs and symptoms of typical pneumococcal pneumonia, specific treatment with both drug and serum is promptly begun. Occasionally the clinical differences are not sharp and if decision is difficult to make, the patient is given the benefit of the doubt and promptly treated.

In the present state of knowledge the use of sulfapyridine is not recommended as a routine method of treatment in every case of suspected pneumonia simply because of fever and rales in the lung. Patients with passive congestion of the lungs, atelectasis, infarct, bronchiectasis, foreign body in the lung or many other conditions may develop fever. The majority of patients never would develop pneumococcal pneumonia anyway and harm may be done with chemotherapy injudiciously used. It is possible that the toxic effects from overdosage with sulfapyridine may depress the patient's own resistive powers. Etiologic diagnosis, therefore, should be carefully attempted in all cases before chemotherapy is resorted to since in many cases, if pneumonia develops, it is often caused by a variety of bacteria, against which the present forms of chemotherapy have no beneficial effect.

Diagnosis in Other Forms of Pneumonia

Etiologic diagnoses are of great importance in many other kinds of pneumonia. When the cause is discovered the plan of treatment can be properly outlined or at least wrongful therapy can be avoided. If certain highly infectious kinds are promptly diagnosed much can be done to prevent the spread of the disease to others. Plague pneumonia may be mentioned as an example.

Recent advances in knowledge have established the fact that in numerous diseases caused by filtrable viruses such as psittacosis, influenza and measles, and in certain diseases suspected of being caused by viruses, pneumonia may dominate the clinical picture. The pneumonia is different clinically from the typical lobar form caused by pneumococci with a few exceptions and different from most other kinds caused by bacteria.[1] Accurate diagnosis is important in such cases, first to prevent the spread of the disease to others, and second, to avoid useless chemotherapy or other ineffective treatment.

Etiologic diagnosis for the same reasons is important in many rare forms of pulmonary inflammation such as those caused by the bacilli of tularemia, brucelliasis and glanders; those caused by protozoa, and rickettsia; by the penetration of larvae during ascariasis, ankylostomiasis and others. In many cases, history and the clinical picture are helpful in diagnosis, but proof must always be sought in the identification of the causative agent or by the use of appropriate serologic and immunologic tests.

Mention must be made of a few specific bacterial pneumonias which occasionally develop in sporadic form but may occur in epidemics as secondary infections particularly during influenza or measles. These pneumonias are often caused by hemolytic streptococci, staphylococci and Pfeiffer's bacilli. Prompt etiologic diagnosis is important in these cases because of the necessity of epidemiologic control and because sulfanilamide is likely to be effective against the hemolytic streptococci in the lung. Diagnosis in these pneumonias depends upon the history and more or less typical clinical characteristics of each disease. The diagnosis is proved by finding the respective bacterium in the sputum or lung juice in pure culture or in predominance, and if they are found in the blood, or in pus if purulent complications develop.

Finally a word must be said about B. Friedländer pneumonia and in M. tuberculosis pneumonia in which diagnosis is important because of the bad prognosis and ineffectiveness of any form of specific treatment. In the occasional patient who recovers from the acute attack of either disease, the likelihood of chronic disease is great.

Roentgenographic Diagnosis. It is properly said that no patient with an infection of the respiratory tract is completely studied without a roentgenogram of the chest. In certain cases pneumonia may be present without giving detectable physical signs and evidence of its presence can only be found in the roentgenogram. The opposite also occurs though less commonly; no abnormal shadows may be cast by an area in the lung where unmistakable signs of pneumonia are heard. The chief purposes of roentgenography are to show that pulmonary disease is present, to locate its position and extent, to follow its progress and to determine the presence of complications and other defects. Except in rare instances etiologic diagnoses cannot be made by roentgenography alone. A few forms like typical pneumococcal lobar pneumonia, staphylococcal pneumonia or B. Friedländer pneumonia with multiple rarefactions, may be occasionally identified but beyond this, one cannot differentiate with certainty the shadows of pneumonia from those of infarcts, bronchiectasis, tumors, atelectasis and many other conditions. In all cases diagnosis can only be reached after the history, clinical findings, laboratory data and roentgenographic data are properly correlated.

Summary

An attempt has been made to point out the importance of making accurate etiologic diagnoses in all cases of acute pulmonary infection. When the cause is known, prophylaxis and specific treatment can be properly used and patients with pneumonia of a sort not influenced by specific treatment may be spared the expense, the inconvenience and the hazards of unnecessary treatment. There are many kinds of pneumonia caused by bacteria, filtrable viruses, protozoa and metazoa, some of which occur commonly and others rarely. For a few kinds of pneumonia, specific treatment is of great value when properly used. In such cases to obtain the benefit of the treatment, an etiologic diagnosis must be made promptly and accurately.

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Pathogenesis and Pathology of Lobar Pneumonia*

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THE pneumococcus is the cause of typical lobar pneumonia. The term lobar pneumonia was first used because at postmortem examination there is usually found a uniform extensive consolidation of one or more lobes of the lungs but in recent years the term is used in a more limited sense to denote a highly characteristic clinico-bacteriologic entity. The pneumococcus is responsible also for many atypical or bronchopneumonias, and for mixed pneumonias where both lobar and bronchial distribution of the consolidation is found at autopsy. There are 32 types of pneumococci, any one of which may produce lobar, atypical, or mixed lesions.[8,13] Finland and coworkers[9] report that pneumococcus types I, III, II, V, VII, VIII and IV, in order of frequency, accounted for 91 per cent of 390 cases of typical lobar pneumonia observed at autopsy. Types III, VIII, V, I, X, VII, VI, XX, XVIII, and II were responsible for 71 per cent of 290 cases in which atypical or bronchopneumonia was found. One-sixth of their cases of typical lobar pneumonia showed also atypical, bronchial and consolidation in other parts of the lung.

Reimann[27] points out that caution should be observed in arriving at the etiologic diagnosis of atypical pneumonias where the higher numbered types of pneumococci are found. These are often only secondary invaders in the lung, frequently coming from the nasopharynx of patients whose disease is caused by one or more of many specific agents other than the pneumococcus. Those most frequently responsible for the atypical pneumonias are the streptococcus, staphylococcus, Friedländer's bacillus, Pfeiffer's bacillus, and influenza virus.[26,13] Our concern here is the pathogenesis and pathology of the lesion produced by the pneumococcus.

Route of Infection

Several avenues, blood stream, lymphatics, air passages, pleura, by which the pneumococci reach the lung have been suggested, none of which has been conclusively established. Formerly, many clinical workers[14,36] believed that the organisms reached the lung through the blood stream from foci in other parts of the body, because in many cases pneumococci appeared in the blood before signs of localization of the infection in the lung or clinical symptoms developed. This view has largely been discarded, for lobar pneumonia does not develop in experimental animals following the injection of virulent organisms into the blood stream.[2,34,36] It has also been observed clinically that well defined lesions may be present in the lungs as seen in the roentgenogram in the early stages of the disease in the absence of abnormal physical signs, and that in such cases bacteremia may also be present.[11] Subcutaneous, intraperitoneal and intrapleural injections of pneumococci into susceptible animals do not lead to lobar lesions in the lungs. Localized abscesses, septicemia, empyema, and pericarditis develop, depending upon the sites of infection.[13,17,34,36]

It is now generally accepted that pneumococci reach the lungs through the air passages. Lobar pneumonia has been produced in experimental animals after virulent pneumococci suspended in a variety of materials have been introduced into the upper and lower air passages.[35,17,3,34,30] Accidental laboratory infections occasionally occur in man from inhalation of virulent pneumococci.[29] It is probable that, in man, virulent pneumococci reach the upper respiratory tract by inhalation of infected droplets or dried cocci which may be carried directly into the deeper parts of the lung or remain in the upper respiratory tract for some time and later be aspirated with mucus into one of the lung lobes.[33,13]

Predisposing Factors

Little is known concerning the optimum conditions necessary for the development of lobar pneumonia. The lowering of the general body resistance through chilling, exhaustion, alcoholism, exposure, starvation, acute and chronic infections, trauma, and following surgical operations have been stressed. Lobar pneumonia occurs rather infrequently under most of these conditions, but often in individuals who are in apparently good health.[26,33,13] More important, apparently, in the production of lobar pneumonia is local disturbance in the respiratory tract, including the smaller air spaces. In the majority of cases an acute infection of the upper respiratory tract or common cold with or without chilling precedes the onset of pneumonia. These factors probably alter the eliminatory mechanism of the lung, allowing excretions to accumulate and produce a local obstruction of the smaller air passages, thus providing a place of growth for the inciting agent. The exact mechanism, however, can only be surmised. Something takes place whereby virulent pneumococci on reaching the smaller air passages, including the alveoli of a given lobe, are held there long enough to initiate a local lesion which subsequently spreads throughout the lobe to produce the picture of lobar pneumonia.[13,33]

Pathogenesis of the Lobar Lesion

Typical lobar pneumonia occurs in the lower lobes about twice as often as all other lobes combined. The incidence of right lower lobe involvement is slightly higher than that of the left.[13] In the majority of cases experimentally it has been described as beginning at or near the hilum of the lobe but in the main near the periphery.[26,3] Roentgenographic studies of early pneumonic lesions show that they have a characteristic morphological appearance only when considered in relation to the clinical history, and that they may occur in any part of the lung fields. The beginning lesions are usually small, and may be demonstrated by roentgenograms many hours before physical signs develop.[11,6]

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Fig. 1. Pneumococcic pneumonia. Margin of spreading lesion. Alveolus filled with edema fluid containing many pneumococci and few leucocytes. (x 1000).

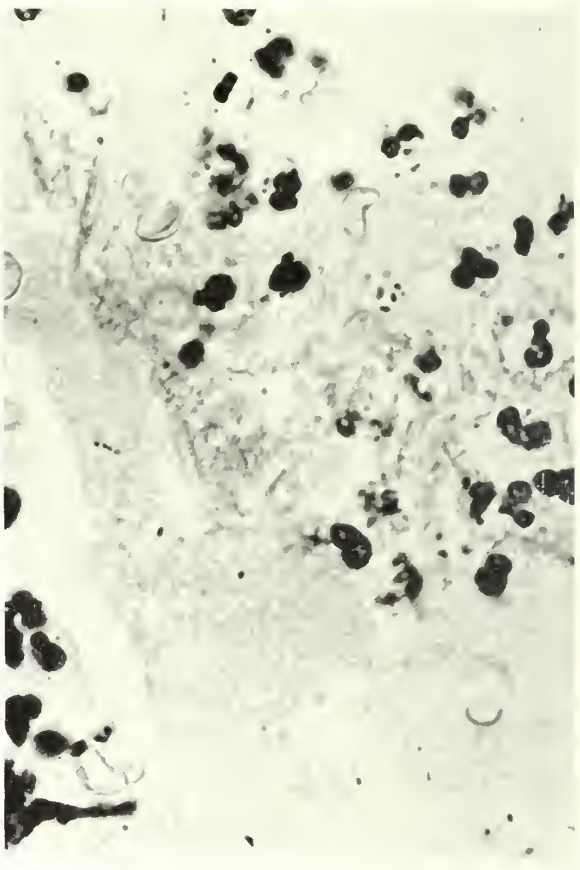

Fig. 2. Pneumococcic pneumonia. Area adjacent to edema zone. Alveolar exudate shows more leucocytes in edema fluid. Pneumococci both free and in polymorphonuclear leucocytes. (x 1000).

Blake and Cecil[3] concluded that, in experimental pneumonia in monkeys, pneumococci enter the air passages, penetrate the walls of the large bronchi at or near the hilum of the lobe and spread peripherally by way of the perivascular and peribronchial lymphatics, interstitial tissue and alveolar walls until the whole lobe is consolidated. Lauche[18] decided that the spread is mainly by the lymphatics where a reversal of lymph flow is set up as a result of congestion of the hilar lymph glands draining the involved lobe. Others[1,35,17,23,34] consider that the primary infection is in the smaller bronchi and alveoli, somewhere in the periphery of the lobe, and that the infection spreads secondarily through the alveolar walls, interstitial tissue and lymphatics toward the hilum. In spite of the wide acceptance of the interstitial and lymphatic spread of pneumococcic infections of the lung, this view is probably incorrect, both as far as being applicable to human cases is concerned, and as to the development of the lesion in experimental animals.[19,32,33] Coryllos and Birnbaum[4] conclude that lobar pneumonia is nothing more than an infectious lobar atelectasis. This view has not been confirmed.

The spread of pneumococcic infections within the lobe most likely takes place through the air passages and the intra-alveolar openings, the pores of Kohn.[15] Recently a number of workers have shown[16,30,32,33,12,20,21] that the initial lesion of lobar pneumonia, both in man and experimental animals, begins as a bronchopneumonia involving the smaller air passages, including the alveoli. Here the first reaction to the invading pneumococci is an abundant[30,12,21] outpouring from the blood vessels and capillaries of an edematous exudate, which fills the alveolar and bronchial spaces (figs. 1 and 2). The pneumococci multiply rapidly in this serous medium. As the alveoli and bronchioles become filled with the infected fluid it spreads in all directions to adjacent alveoli through the alveolar pores and into uninvolved bronchi by repeated aspirations. In this way new areas of inflammation are set up which contribute to further production of edema. This process continues fairly rapidly until the whole lobe is consolidated. The edematous exudate always precedes the migration of cells into the air spaces[19,30,21] (figs. 1, 2 and 3). Few pneumococci are present in the interstitial tissue and lymphatics where they appear after the alveoli are involved. Those getting into the lymphatics are carried to the hilar lymph nodes and those entering the blood stream are carried away from the lung.

Loeschcke,[16] Lauche,[18] Fried[10] and others consider the abundant edematous and fibrinous exudate a manifesta-

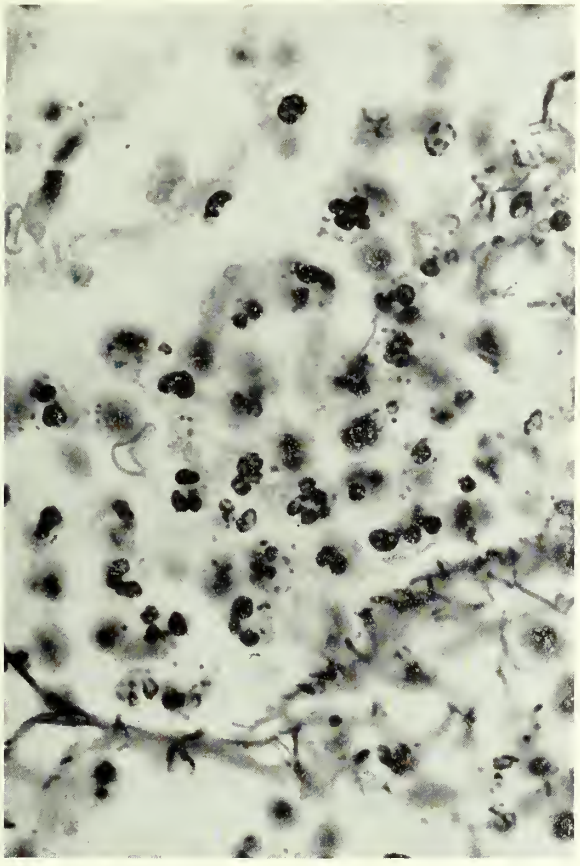

Fig. 3. Pneumococcic pneumonia. Early cellular exudate. Leucocytes have ingested large numbers of pneumococci. (x 1000).

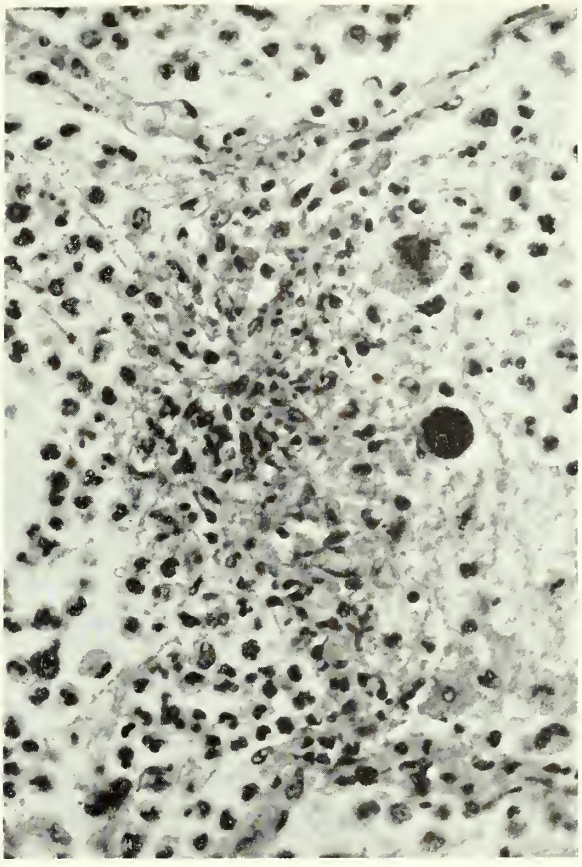

Fig. 4. Pneumococcic pneumonia. Early lesion showing intense congestion and migration of leucocytes from alveolar capillaries into alveoli. (Hematoxylin-eosin azur II stain. x 580).

tion of a hypergic reaction. However, previous hypersensitivity to the pneumococcus probably plays a small role in the pathogenesis of the lobar lesion. There is no evidence that it contributes to the reaction in human cases, and lobar lesions can be produced in animals who have not been previously sensitized to the infecting organisms.[26,13,33]

Recently Dick and Boor[7] have prepared a "toxin" from pneumococcus filtrates which, when injected intracutaneously, induces a reaction characterized by marked swelling and edema. Sutliff and Friedemann[35] have also shown that pneumococcus filtrates, when injected into the lungs of dogs or under the skin, produces a local outpouring of edema such as occurs in pneumococcic infections. They call the active ingredient in the filtrate the "edema producing substance." The nature of this substance or its relation to other toxic substances derived from pneumococci was not determined.

Typical lobar pneumonia always begins as a lesion called atypical or bronchopneumonia. Why pneumonias as caused by some pneumococci continue to be atypical in nature and why others develop into the typical lobar form is problematical. It is thought that the more virulent strains produce the typical lobar lesions and less virulent strains atypical lesions. Whether pneumococci cause typical or atypical pneumonia may also depend upon the amount of toxic or edema-producing substance they elaborate, those producing small amounts giving rise only to bronchopneumonia and those producing large amounts causing lobar lesions, but perhaps most depends upon the state of the patient and his reaction to infection.[26] Although the exact nature of the exciting agent is not known, the abundant edema fluid produced in response to pneumococcic infections in the lungs probably acts as an important vehicle for the rapid and often uniform dissemination of the inflammation throughout the lobe and from one lobe to another.[19,33,12,21]

Gross Pathology of Lobar Pneumonia

The consolidated lobes are, as a rule, smaller than the uninvolved lobes. The color and consistency depend upon the stage of consolidation[4,32]. The four stages, engorgement, red and gray hepatization, and resolution, in the development of the lobar lesion have been recognized for at least a hundred years. Little alteration has been made in this classification during this time. It should be remembered that these terms refer to the sequence of changes seen in a given part of a lobe rather than in the lobe as a whole. The initial lesion of lobar pneumonia usually occupies a small portion of the lobe and many hours may elapse before the inflammation has spread to involve the whole lobe. Thus the portion initially involved may be in a stage of red or gray hepatiza-

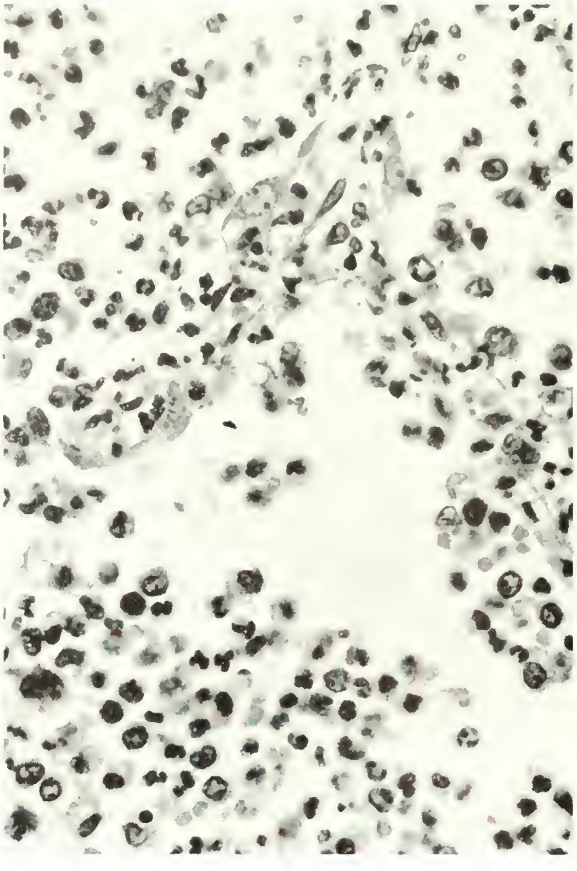

Fig. 5. Pneumococcic pneumonia. Lesion 36 to 48 hours old. Alveolar walls show beginning hypertrophy of septal cells. Exudate contains a moderate number of hypertrophying (polyblasts) lymphocytes and monocytes and a few small macrophages. (Hematoxylin-eosin azur II stain. x 620).

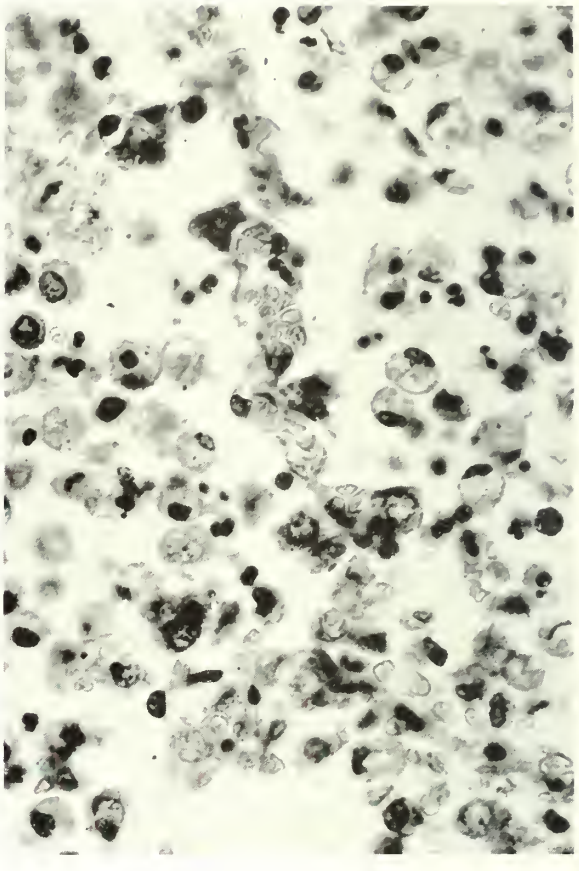

Fig. 6. Pneumococcic pneumonia. 4 to 6 day lesion. Alveolar walls show proliferating septal cells. Exudate contains degenerating polymorphonuclear leucocytes. Pneumococci all intracellular. Exudate consists principally of mononuclear phagocytes containing leucocytes, red blood cells and pneumococci. These cells have originated from the hyperplasia of lymphocytes and monocytes which have migrated from the blood and from the local hyperplasia and detachment of septal cells in the alveolar walls. (Hematoxylin-eosin azur II stain. x 620).

tion while the periphery of the lesions shows only engorgement. By studying many sections of the same lobes all stages can usually be observed.[8,16,32,21]

Only a few details of the sequence of changes which occur in a given part of a lobe to give the picture of engorgement, hepatization and resolution will be mentioned here. The area of early involvement is congested and edematous. The alveolar capillaries are engorged with red blood cells and leukocytes. The alveoli and bronchioles are filled with edema fluid containing red blood cells, a few leukocytes, pneumococci and old alveolar macrophages (figs. 1, 2 and 3). As the inflammation spreads the advancing margin of the lesion continues to show this picture. The fibrin in the alveoli and on the pleural surfaces soon clots. The cut surface becomes dry, red and granular to give the appearance of red hepatization. The leukocytes keep migrating from the blood vessels and capillaries in large numbers. The alveolar walls are still engorged but otherwise are normal. The exudate contains increasing numbers of leukocytes, some pneumococci and an abundant amount of fibrin.

In this area, leukocytes continue to migrate from the alveolar capillaries and blood vessels and fill the alveolar spaces so that the walls become compressed and the capillaries empty. This area becomes indurated and now has the grayish color of gray hepatization. Mononuclear cells begin to appear in and on the walls of the alveoli and varying numbers of lymphocytes, monocytes, and macrophages are present in the exudate (figs. 4 and 5). The polymorphonuclear leukocytes and macrophages contain ingested pneumococci; some are beginning to degenerate. Gray hepatization gives way to resolution gradually as the area becomes soft, friable, and the cut surface grayish yellow in color. The exudate is slimy and shows a marked degeneration of the polymorphonuclear leukocytes and disintegration of fibrin. The septal cells are now proliferating on the alveolar walls. A few lymphocytes and monocytes are present but the predominant cell is the mononuclear phagocyte which has ingested degenerating leukocytes, pneumococci and cell debris[31] (fig. 6).

The manner by which the consolidated lung rids itself of the exudate is not clearly understood. Only a small part is eliminated by expectoration. The major part of the exudate is autolyzed by enzymes liberated by the degenerating leukocytes and by the mononuclear phagocytes which are present in large numbers throughout resolution. These macrophages also assist by ingesting and

digesting large numbers of cell fragments, organisms and particles of fibrin. In this manner the air spaces are cleared and gradually the lung returns to its natural state and function. Through all stages of the inflammation the circulation in the consolidated portion of the lung is sufficient to prevent necrosis and maintain the integrity of the alveolar and bronchial walls. If the lung fails to clear, however, organization takes place. The macrophages are transformed into fibroblasts and a proliferative reaction occurs in the alveolar walls which obliterates the normal architecture of the lung and transforms it into a fibrotic scar.[16,31]

Histogenesis of Cells in Lobar Pneumonia

In the pneumonic lesion the polymorphonuclear leukocytes migrate from the blood vessels and capillaries in large numbers and are the first cells to appear in the alveolar exudate (figs. 2, 3 and 4). They ingest pneumococci but are relatively short lived and begin to degenerate after 48 to 72 hours.[19,16,28,32,21]

At the same time, varying numbers of lymphocytes and monocytes migrate from the blood into the alveolar spaces where they assume polyblastic forms.[5,25,21]. They soon hypertrophy, accumulate cytoplasm, become less basophilic and transform themselves into mononuclear phagocytic cells (figs. 4, 5 and 6). Many alveolar phagocytes of lymphocytic and monocytic origin are present in the exudate before the local macrophage reaction begins. Many transitional forms between the lymphocyte, monocyte and macrophage are seen in sections of early lesions, but they continue to migrate from the blood in all stages of the disease (figs. 4, 5 and 6). The continued hypertrophy of the lymphocytes and monocytes into mononuclear macrophages accounts for the fact that they are more frequently seen in the early stages of the inflammation.[21]

The second source of the mononuclear phagocytes (fig. 6) which are present in large numbers in the exudate in the late phases of gray hepatization and during resolution, is the local hypertrophy and proliferation of cells in and on the alveolar walls.[10,12,32,33,20] These cells have long been referred to erroneously as desquamated alveolar epithelial cells.[1,36,25,3,16] A flattened layer of cells, in addition to those which become detached, and function as macrophages, cannot be seen lining the air spaces. The problem of whether or not there is an epithelial membrane lining the alveolar spaces in normal lungs is still unsettled.[10,20,21] It is certain that those cells which are called desquamated epithelial cells have the same morphology and function as tissue histiocytes or macrophages which appear in response to infections. Once in the alveolar spaces they become morphologically indistinguishable from the mononuclear phagocytes of lymphocytic and monocytic origin. There is, however, no clear evidence that these cells have an endothelial[24] or epithelial origin.[2,20,21]

The macrophages do not appear suddenly in the alveolar spaces but accumulate gradually and become conspicuous after three or four days when the polymorphonuclear leukocytes begin to degenerate. To follow this development it is necessary to study the inflammatory process in relation to the age of the lesion in all stages of the disease and especially at frequent intervals after the onset.[21] This will show that the sequence of cellular changes in pneumococcic infections of the lung is the same as that in inflammations produced by the pneumococcus and other agents in other parts of the body.[22]

Mechanism of Recovery

As in other infections, the macrophages which appear in the alveolar exudate seem to play an important role in the mechanism of recovery.[32,33] They aid in the process of resolution by ingesting and digesting fragments of fibrin, degenerating cells, and cell debris.[16,32] More important perhaps is their ability to ingest and digest large numbers of pneumococci.[32] They apparently destroy pneumococci much more effectively than do the polymorphonuclear leukocytes, but are dependent on antibodies (opsonins) for their antipneumococcic activity. The mechanism of recovery, according to Robertson,[33] appears to be of a dual nature, consisting of a generalized process which acts to localize the infection and prevent or control bacteremia, and of a local accumulation of macrophages which enable the lung to rid itself of microörganisms. If both processes are effective, recovery results; if either fail, death ensues.

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The Present Status of the Treatment of Pneumonia

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BECAUSE of the limitations of space, it seems advisable to consider here only the important, specific agents which have proved to be of definite life-saving value. For practical purposes these include, first, specific serums for the pneumonias due to certain types of pneumococci and, second, the newer chemotherapeutic agents, notably sulfapyridine. Without attempting to present a detailed review of the voluminous literature, it is proposed in this paper to summarize the recent experience with these agents and to present a rational and practical approach to the therapy of pneumonia in the light of this experience.‡

The development of the serum treatment of pneumonia was slow at first, but in the past few years it has advanced at an ever accelerating pace. Our present knowledge concerning the type-specificity of pneumococci serves to explain the failures of early workers to influence the experimental infections, and particularly the failures to obtain good clinical results in the treatment of pneumonia. The classification of pneumococci into types through the pioneer work of Neufeld and the extensive studies at the Rockefeller Institute was followed by the introduction of unconcentrated Type I antipneumococcus horse serum. Although this serum was generally recognized as being an effective agent in cases due to this type, particularly if treatment was undertaken early, its use never became widespread. The introduction of methods of concentration and standardization of pneumococcus antibodies, notably through the persistent efforts of Felton, simplified the practical application of serum therapy and increased its efficacy. The usefulness of serums was extended to include Type II infections, although the results in cases of this type were not so striking as disease caused by Type I pneumococci. Cooper's more detailed classification of the pneumococci formerly included in Group IV made possible a further extension of specific serum therapy through the preparation and concentration of horse serums for some of the more frequent of the newer types. The value of such serums in the treatment of cases due to Types V, VII and VIII pneumococci became readily apparent.

The more recent introduction of rabbit antipneumococcus serums made possible the production of highly potent and effective serums for all the known pneumococcus types, with the possible exception of Type III. Both unconcentrated and concentrated rabbit serums have been shown to be highly effective in typical cases of lobar pneumonia due to all of the more frequent types. No accurate estimate is yet available of the extent to which the case fatality rate can be reduced by the proper use of such serums, since the number of reports of large series of cases is still too few. However, the results already reported from New York, Baltimore, Pittsburg, Boston, Chicago and also from Denmark all point to a marked reduction in death rates in the pneumonias due to all types of pneumococci other than Type III. In particular, the cases due to Types I, II, IV, V, VII, VIII, XIV and XVIII have shown uniformly favorable results. Mortality rates of 10 per cent or lower are reported for groups of cases which, judging from age distribution, incidence of bacteremia and previous experience, have usually been associated with death rates three times as great or even more. At least three series, each of over 100 cases, have been reported in which less than 5 per cent of serum treated patients died. The benefits from specific serums were also apparent from the rapid termination of the acute course of the disease in response to treatment. There is suggestive evidence that the incidence of purulent complications developing after treatment is reduced. In almost every instance, death or failure to influence the course of the disease favorably has been attributed to treatment

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‡For a detailed and thoroughly authenticated presentation of the historical and practical aspects of the general therapy of pneumonia, the reader is referred to Heffron's "Pneumonia, with Especial Reference to Pneumococcus Lobar Pneumonia," that has just been published. Reimann's "The Pneumonias" is recommended for a concise and authoritative resumé and particularly for its treatment of the atypical and the non-pneumococcus pneumonias. Bullowa's "The Management of the Pneumonias" contains an extensive review of the details of specific serum and oxygen therapy. These three books should be readily accessible to all physicians who are likely to deal with any number of pneumonia patients.

begun late in the disease, usually after the fifth day, in the face of massive infection, or it is associated with severe focal complications or other serious systemic disease. The recent serums, both concentrated and unconcentrated, have proved effective when used later in the disease, in older patients and in more severe cases than any that had previously yielded to specific agents.

Successful serum therapy depends on:

1. *Early Diagnosis.* Patients treated during the first four days respond more favorably and less antibody is required. This emphasizes the importance of recognition of the early symptoms and signs which lead one to take the necessary steps to determine the etiological agent. The etiological diagnosis, in turn, depends on accurate and efficient pneumococcus typing. Experience has shown that such typing can be made readily available in almost any community. Serum requires an intact immune mechanism in the recipient in order to be effective, and this may be impaired during a prolonged and severe infection.

2. *Adequate Treatment.* This means that highly potent serums should be administered, so refined that they can be given conveniently in the proper amounts without danger of severe untoward reactions. With recent serums complete therapeutic doses have been given within two to four hours, frequently in a single injection, with a minimum of unpleasant side reactions.

3. *Acquaintance with Serum Therapy.* Serums, to be effective, must be given *intravenously* except perhaps in infants and children, in whom the intramuscular route may be used successfully, but large doses are then required. Since we are dealing with large amounts of foreign protein, the precautions necessary for the safe use of such materials must be taken. These should be known to all physicians.

The limitations of serum therapy are now fairly well recognized:

1. It is strictly *type-specific* in its action; hence failures may arise from (a) technical errors in type diagnosis, (b) the presence of multiple types in the sputum, (c) mixed infections or superinfections with organisms other than pneumococci or (d) failure to recognize the true etiological agent by the known simple methods when the pneumococcus found is only an incidental contaminant. To be sure, errors in typing are now exceedingly rare and repeated sputum examinations limit such errors still further. In most instances, acquaintance with the relative significance of the various types is sufficient to avoid serious errors. A proper examination of a good, fresh specimen of sputum directly by the Neufeld method will usually differentiate the inciting pneumococcus from the incidental contaminant.

2. Cases of pneumococcus Type III pneumonias, which constitute from 10 to 20 per cent of the total and usually are associated with a high mortality rate, do not respond regularly to treatment with specific serum alone. It may, however, be an important adjunct to chemotherapy.

3. Focal complications, when already established, are not affected by serums. To be sure, infected pleural exudates present early in the disease have resorbed without surgical intervention following serum therapy perhaps more frequently than in patients not specifically treated.

4. Untoward reactions, those due to specific sensitivity to the serums used and those due to unknown factors in the serum as well as delayed serum sickness, still occur and, in occasional cases, may be disturbing. These reactions are now infrequent with the newer rabbit serums, and serious ones are rare. With adequate precautions, the dangers and discomforts from such reactions may be minimized.

5. Serum therapy is expensive: the necessary diagnostic setup, the cost of the serum, time and effort required for its proper use. The results obtained in suitable cases, at least until the advent of the recent chemotherapy, have amply justified the expense involved. For the most part, the burden of the expense has been gradually shifted in many communities to governmental or semipublic agencies. Recent reports from Denmark would indicate that effective rabbit serums can be produced at remarkably low cost.

Turning now to chemotherapy, it is of interest that the first reasonable and partially successful attempts to influence pneumonia or other pneumococcal infections by chemical agents, namely, through the use of quinine and similar compounds, almost paralleled the introduction of rational specific serum therapy. Although the use of such compounds still has adherents in Continental Europe, particularly in Germany, they were never enthusiastically received, the evidence for their efficacy is not convincing and there is still some doubt as to their safety when used in doses that might be expected to be effective. While many related compounds have been successively hailed as highly effective and nontoxic, only the most recent one, namely hydroxyethylapocupreine, has given any real promise in this respect. Only meager data concerning its use are now available and the results of further trials will be awaited with interest. The mechanism whereby these drugs exert their effect is not understood.

The introduction of sulfanilamide and related compounds has profoundly altered the outlook for the chemotherapy of pneumonia, as it has for a host of other bacterial infections. The early investigations indicated that sulfanilamide has a definite bacteriostatic effect on various types of pneumococci, both in vitro and in vivo, and experimental infections were frequently, though irregularly, cured with this drug. It was natural, therefore, that many physicians began to use this drug in human cases of pneumonia and in other pneumococcic infections, particularly under conditions in which specific serums had not proved useful. Early reports indicated that this drug was definitely effective in certain cases of pneumococcic meningitis, and there was suggestive evidence that it influenced the course of Type III pneumonia favorably. Undoubtedly, numerous physicians have used this drug in large numbers of cases of pneumonia, but only scattered reports of favorable results have appeared, while most observers have not been impressed with its effectiveness except as already noted.

The discovery by Whitby that M and B 693, the pyridine derivative of sulfanilamide, now officially known as sulfapyridine, exerts a marked bacteriostatic and considerable bactericidal action against pneumococci, irrespective of type, and the demonstration that this drug could be used safely, constitute perhaps the greatest advance in the treatment of pneumococcal infections. The early reports on the use of this drug in the treatment of pneumonia were almost totally lacking in the necessary basic data for their proper evaluation. Numerous favorable and enthusiastic reports have appeared, however, among which are a significantly large number of cases with adequate data concerning the important prognostic factors, namely, age, results of blood cultures, extent of pulmonary lesion and pneumococcus type. The sum total of the results in these cases leaves little room for doubt that sulfapyridine is a highly effective curative agent in the treatment of pneumonia. The average reported mortality is generally below that previously reported in serum treated cases as a whole. The data for comparison with the results of the use of the more recent rabbit serums are as yet inadequate. Sulfapyridine, like serum, has not been found to influence the course of focal complications after they have become established. Meningitis, and possibly peritonitis, are notable exceptions. The results of treatment in atypical pneumonias have not been uniformly favorable.

From the various reports that have appeared to date and from our own experience, sulfapyridine presents certain advantages over specific serums in the treatment of pneumonia. (1) It has a much wider range of usefulness, being effective against practically all pneumococcus types, against hemolytic streptococci and perhaps other bacteria. It is therefore useful in the treatment of mixed infections either with multiple pneumococcus types or with pneumococci and hemolytic streptococci. (2) Sulfapyridine is simple to administer, since the oral route is usually effective. (3) The action of sulfapyridine is independent of the immune mechanism. It may therefore be effective in debilitated individuals or when used late in the disease after the body defenses have been seriously impaired. It is most effective, however, when the immune mechanism is intact and specific antibody is present. (4) It is relatively inexpensive.

Sulfapyridine, like specific serums, also has certain limitations. These are mainly concerned with its toxic effects, which are now fairly well known, and include: (1) Nausea and vomiting which are by far the most frequent. Occasionally there is diarrhea. These symptoms do not often yield to ordinary measures, but may subside spontaneously. (2) Anemia, which may be of the severe hemolytic type and occur in the first three days, but more often it is mild and occurs after a week or more of treatment. (3) Leucopenia, which likewise occurs late but may be severe and even result in fatal agranulocytosis. Usually, however, this subsides if the drug is promptly discontinued. (4) Renal complications may include hematuria, renal colic, nitrogen or water retention and the formation of concretions of the insoluble acetylated form of the drug in various parts of the urinary tract. (5) Mental symptoms, varying from profound depression, especially in patients receiving barbiturates, to marked excitement and toxic psychoses which may persist long after the drug is discontinued. (6) Liver damage of a minor degree may be demonstrated by chemical studies in many cases, but severe toxic damage is probably rare except after prolonged use of the drug or in cases who have received it previously. (7) Drug fever usually occurs after a week of treatment, but may begin earlier. (8) Drug rashes, usually morbilliform in character, with or without fever, also occur about the same time. Fever and rash are often precursors or occur along with severer symptoms, such as hemolytic anemia, agranulocytosis and liver damage. (9) Cyanosis may occur but is usually not marked. There is no accompanying acidosis and alkalis are not indicated for this purpose.

Another disadvantage in the use of sulfapyridine is its irregular absorption, excretion and acetylation. Theoretically, a concentration of 4 mg. or more of the drug per 100 cc. of blood is necessary to have any definite antipneumococcic effect, and concentrations of 7 to 10 mg. are essential in streptococcal infections. These levels can usually be maintained with the dosage generally recommended, namely, one or two doses of 2 grams, followed by 1 gram every four hours. However, lower levels in the blood have given good results in many cases, and higher levels have been ineffective in others. It may be particularly dangerous to use the drug in cases having renal impairment. Resistant strains are not readily recognized. It is not known when the drug may be discontinued without danger of relapse.

COMMENT

Because of the proven efficacy of both specific serums and sulfapyridine, physicians should be thoroughly acquainted with the use of both these agents and be prepared to treat their patients with either or both. There is a considerable weight of evidence to indicate that, at least theoretically, the combination of serum and sulfapyridine is more effective than either agent used alone. Less serum should be required and the drug may safely be discontinued earlier. The use of the drug alone, particularly in early cases, may need to be continued for several days, at which time the dangers of severe untoward reactions increase.

For practical purposes, since it may be desirable or necessary to use serums, it is important that sputum should be obtained for typing and blood taken for culture as soon as the clinical diagnosis of pneumonia is made. A history should be obtained concerning previous serum and drug therapy, blood counts made and urine examined. The following scheme has been recommended for the choice of therapy in any given case. It is designed to take the fullest advantage of the benefits of both serum and sulfapyridine with the minimum of their disadvantages.

Sulfapyridine should be used alone and serum avoided if possible in the following conditions:

1. Patients with a strong history of asthma or other allergic manifestations and particularly those who are

specifically sensitive to the animal serum available or to the emanations of that animal.

2. Patients who have been treated with serum from the same animal source within a few months.

3. Patients who are in extremis or have definite evidence of cardiac or peripheral vascular failure. Such cases may receive serum later, if necessary, when these conditions have yielded to therapy, and preferably after sulfapyridine has been given.

4. Patients showing obvious improvement after 18 to 24 hours of sulfapyridine therapy. (Serum is presumably unnecessary.)

Sulfapyridine and serum should be used under the following conditions:

1. When sulfapyridine has been given in the usual doses for 18 to 24 hours without obvious improvement.

2. In patients over 40 years of age.

3. In pneumonias complicating pregnancy or the puerperium.

4. When more than one lobe is involved.

5. When pneumococcus bacteremia is known to be present.

6. In all severe cases due to the Type III pneumococcus. In such cases it may be advisable to delay serum treatment until six to eight hours after the first dose of sulfapyridine.

7. In severe cases treated after the third day.

8. When the administration of the drug is accompanied by severe nausea and vomiting or other serious toxic effects.

Serum should be used alone and sulfapyridine should be avoided if possible under the following conditions:

1. In patients with leucopenia associated with a low proportion of polynuclear cells.

2. In the presence of severe anemia.

3. In the presence of jaundice.

4. When there is impaired renal function.

5. In postoperative cases, especially soon after abdominal operations.

6. In patients who have previously received sulfapyridine and have been known to have a resulting drug rash, leucopenia, anemia or jaundice.

7. In cases diagnosed during the first two or three days, the use of serum alone may be advantageous because of the striking and rapid beneficial effect and because the toxic effects of the drug can be avoided.

Serum treatment should be discontinued in those who have had a severe shock-like reaction, an asthmatic attack or urticaria or alarming thermal reactions following the injection.

Sulfapyridine should be discontinued for rapidly developing anemia, jaundice, hemoglobinuria, hematuria, leucopenia, nitrogen retention, edema, drug rash, marked overexcitement, intractible vomiting or failure to obtain obvious clinical improvement after 36 to 48 hours, provided that serum has not been given and focal complications are not present.

The Control of Pneumonia

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A DISCUSSION of the recent accomplishments of health department pneumonia control programs as illustrated by that of the New York City Department of Health may be of interest to those who are now contemplating new or continued efforts directed towards the reduction of the menace of this most important group of infectious diseases. Before taking up specific data, it is well to mention some methods for the control of pneumonia other than the use of type specific serum therapy, since such other methods were discussed in the development of the pneumonia control campaigns now in operation. Preventive measures, which, if they are effective, are to be preferred to therapeutic measures for the control of the disease, have been employed under certain conditions to reduce the mortality and morbidity of pneumonia. Preventive vaccination is the first of these. It has been employed[1] among the natives working in the diamond mines in South Africa, using mixed, killed, bacterial vaccines containing several types of pneumococcus as well as other bacteria found in the nasopharynx of patients in the same locality. These studies have been reported to show a striking effect in reducing the mortality rate and the morbidity rate of the disease among the unusually susceptible African natives who comprise the working force in South Africa.

A second type of preventive vaccination has been developed in the United States by L. D. Felton[2] using a chemical fraction of the pneumococcus. This soluble antigen has been used[3] for vaccination in a large number of camps of the Civilian Conservation Corps in New England and on the west coast during recent years with a resulting lower morbidity rate from pneumonia among the vaccinated men as compared with those not vaccinated who were observed as controls. The morbidity and the mortality of the disease, as would be expected, were low due to the age of the workers in the group studied. So few died that no information with regard

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to the effect of vaccination on the mortality rate was obtained. The degree of protection reported in the South African diamond mines and in the C.C.C. camps did not approach complete disappearance of pneumonia, therefore, the application of the method to civilian population does not at present appear to be warranted. A secure foundation has been laid, however, for the use of preventive vaccination among groups of persons with unusually high attack rates from pneumonia.

Another commonly used method for the prevention of infectious or contagious disease is the strict isolation of patients to prevent its spread to others. Methods of isolation to be used for patients with pneumonia are based on knowledge of the epidemiology of the disease. They have already been applied and under certain conditions have resulted in an apparent reduction in the number of cases arising from contact with such patients. Favorable reports have been made by Opie, Blake, Small and Rivers[4] and by Benjamin and Ruegsegger.[5] These studies indicate that the transmission of pneumonia from patient to patient in a crowded hospital may occur if the technic of isolation is not employed, and that the use of strict precautions will reduce the frequency of such contagion. The result of the application of such precautionary measures to pneumonia patients in a community under ordinary conditions when sporadic cases of pneumonia constantly occur has not been reported; and, as a matter of fact, epidemiological studies have not yet provided a satisfactory experimental basis for such an enterprise. We thus find that some degree of isolation is advisable in hospitals, but no clear case for the general application of isolation precautions to patients throughout a community has yet been developed.

Campaigns for the Control of Pneumonia now in progress are based chiefly upon the use of therapeutic methods which promise to reduce the mortality from the disease. The use of type specific antipneumococcus serum is the therapeutic measure most widely advocated and employed for this purpose. Other measures such as chemotherapy oxygen therapy, drug and other symptomatic therapy are also included. Chemotherapy has become a matter of great importance through the widespread use of sulfapyridine. The results obtained in New York City from the use of antipneumococcus serum, as compared with the results of chemotherapy, will illustrate what may be expected from the use of these measures in campaigns for the control of pneumonia.

Activities of the Pneumonia Control Division of the New York City Department of Health

A "Division of Pneumonia Control" was set up in the Bureau of Laboratories of the New York City Department of Health in November, 1937, at the suggestion of the organized medical profession of the city. The activities carried on by this Division are characteristic of the activities carried on by similar health department units elsewhere, and represent a system for placing the materials and instruction necessary for the etiological diagnosis and type specific therapy of pneumonia into the hands of physicians.

A whole-hearted response of the medical profession developed during the course of the New York City Department of Health Pneumonia Control Campaign and this response resulted in the unusually low fatality rates from pneumonia about to be reported.

Fatality Rates of Serum Treated Patients

The fatality rates among treated patients are the principal evidence as to the effects of a program of therapy for pneumonia. It is to be expected that other benefits, such as shorter duration of the disease, shorter hospital stay and resulting decreases in expense of illness will also occur in association with the primary effect on the fatality rate.

Table 1 shows the fatality rates for 1065 patients treated with serum, for which reports were received during the first quarter of 1939. A fatality rate for the whole group of 7.4 per cent was obtained. The addition of 60 patients not included here in whom the etiological diagnosis was not clear because of the presence of more than one type of pneumococcus in the sputum would make the percentage of deaths slightly smaller. The inclusion of another group of patients who received some form of chemotherapy (sulfapyridine in 105, sulfanilamide in 69, neoprontosil in 29, and other chemotherapy in 2 making a total of 205 cases with 35 deaths) would increase the percentage of fatalities in the whole series from 7.4 per cent to 8.9 per cent, but the total mortality percentage still remains unusually low. To account for the higher mortality in those treated with these drugs, it seems likely that previous to April 1, 1939, chemotherapy was given only to patients who were seriously ill, perhaps in many instances as a last resort.

Subdivision of the 1065 cases in table 1 shows that the fatality rates at all ages are unusually low as compared with previous statistics. No deaths among 32 patients less than 2 years of age, and the occurrence of only 2 deaths among 245 patients from 2 to 19 years of age (0.81 per cent) are especially striking. The fatality rate in patients in whom the treatment was begun during the first three days of illness is lower than that of patients treated later (table 1). The administration of amounts of serum (table 1), ranging from 51,000 units to 200,000 units per patient is followed by lower fatality rates than when either more or less serum was used. The fatality rate among patients treated at home (table 1) was about one-half of that of patients treated in hospitals. The fatality rate of 9 per cent in patients sent to hospitals is similar to or lower than that reported by many previous workers whose experience was confined to hospitals.

Further subdivision of the pneumonia cases into those associated with different types of pneumococci (table 2), shows that with the possible exception of Type VI, the fatality rates are uniformly low.

The results reported above represent the lowest fatality rates reported to date for pneumonia serum therapy administered throughout a community, by the divided-dose method. Equally low and even lower fatality rates have

TABLE 1

Fatality Rates of Serum Treated* Pneumonia Patients Reported to the Pneumonia Control Division, Department of Health, New York City, in the First Quarter of 1939

Classification	Number of Cases	Percent of Total in Each Classification	Number Died	Percentage Died
Total	1065	100.00	79	7.41
By Age Group[1]				
Less than 2 years	32	3.01	0	
2 to 19	245	23.00	2	0.81
20 to 39	374	35.12	20	5.34
40 and over	398	37.37	55	13.81
By Duration Before Treatment[2]				
Less than four days	662	62.16	36	5.43
Four days or more	364	34.18	40	10.16
By Serum Dosage[3]				
Less than 50,000 units	96	9.01	12	12.50
51 to 100,000 units	326	30.61	10	3.06
101 to 200,000 units	430	40.38	28	6.51
201 to 500,000 units	192	18.03	21	10.93
Over 500,000 units	19	1.78	8	42.10
By Institution				
Home	332	31.17	13	3.91
Hospital	733	68.83	66	9.00

*Without chemotherapy.

[1]Age not reported—16 cases which include 2 deaths.

[2]Duration before treatment not known—39 cases, which include 6 deaths.

[3]Dosage not indicated—2 cases, 0 deaths.

been reported by workers using other methods, and these should be taken into consideration in further plans.

Serum therapy, using unconcentrated rabbit serum in large dosage (100,000 to 200,000 units) administered so far as possible in one dose to patients with pneumonia of the severity usually found among patients sent to the hospital has led to impressive results by several workers. A summary of three recent reports (6, 7, 8) shows 227 patients with pneumonia due to eight different types of pneumococci (Type III excluded) with 10 deaths, or a fatality rate of 4.4 per cent.

The fatality rates of a group of pneumonia patients treated with sulfapyridine at home in April, 1939, in whom bacteriological diagnosis was made in the Pneumonia Control Division laboratories in New York City and were reported to the Department of Health in the same manner as the serum treated cases described above, may indicate what is to be expected of sulfapyridine treatment as compared with serum treatment in the community. In a group of 86 cases there were 4 deaths, a fatality rate of 4.7 per cent. Type III cases were excluded from this group. This may be compared with the 3.9 per cent quoted above for 332 cases (not including Type III) treated with serum at home.

Application of New Information to Pneumonia Control Campaigns

In the immediate future, it would appear that both antipneumococcus serum and sulfapyridine should be used. Sulfapyridine will be preferred by many because

TABLE 2

Fatality Rates of Serum Treated Patients According to Type of Pneumococcus

Type of Pneumococcus	No. of Cases	Percentage of Total Cases	Number Died	Fatality Percent
I	383	35.96	16	4.17
II	90	8.45	13	14.44
IV	64	6.01	6	9.38
V	99	9.30	6	6.06
VI	46	4.32	6	13.04
VII	140	13.14	15	9.29
VIII	153	14.37	13	8.50
XIV	77	7.23	3	3.89
Other types	13	1.22	3	23.08
All types	1065	100.00	79	7.41

of its low initial cost, its effectiveness in pneumococcus pneumonia without waiting for determination of the type, and its probable effectiveness in hemolyticus streptococcus pneumonias. Others will be discouraged by the frequent appearance of nausea and vomiting and other more serious toxic effects of sulfapyridine and prefer serum on account of its striking symptomatic effects. It is obviously advantageous to limit therapy to one agent, provided it will produce the desired effect alone, but such a choice cannot be made from the evidence now available. Continued studies of both serum therapy and chemotherapy will provide data through which definite indication may be recognized for the separate use of each agent and for their use in combination.

Plans for carrying out well-rounded and effective activities by health departments for the control of pneumonia should be undertaken from the broadest possible foundations of present facts and possible future improvements. Such activities must be undertaken with the advice and whole-hearted coöperation of the medical profession, and must be adapted to the needs of the community. The experience in New York City indicates that control of pneumonia, based upon the widespread use of efficient therapy, is entirely feasible.

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Minnesota's Oldest Medical Journal*

James Eckman†
Rochester, Minnesota

"I came west, a young and ambitious man, from New England, reaching here in 1869. I found no medical journal here. There was none published west or north of Milwaukee. I found, in conversation with the older men, that there was a probable field for one, and began the *Northwestern Medical and Surgical Journal*, in the spring of 1870."[1]

Thus spoke Alexander J. Stone, M.D., LL.D., in December of 1908, in reference to the remarkable circumstances which led to the establishment of Minnesota's oldest medical journal, surviving today in the form of THE JOURNAL-LANCET. Armstrong[2] has revealed the fact that "a publication called the *Minnesota Homeopath* was issued in St. Paul," probably in 1854, and also that the *Homeopathic Bibliography of the United States from the Year 1825 to the Year 1891, Inclusive*, by Thomas Lindsley Bradford, M.D., published in Philadelphia by Boericke & Tafel in 1892, lists the *Minnesota Homeopath* as being a bi-monthly, begun by G. Hadfield in 1854 in St. Paul. Armstrong wrote that the correct name of the editor of the aforementioned journal was "Hatfield" and not "Hadfield". The archives of the Minnesota Historical Society contain Number 4 of Volume 1 of this journal; the libraries of the Ramsey County Medical Society, the Hennepin County Medical Society, and The Mayo Clinic, have none. Evidently the publication was ephemeral, since only a few numbers of it were ever printed, and copies of those numbers are indeed a rarity among Minnesota historical items. It is probable that no "regular" physician of the age would have found much use for the *Minnesota Homeopath*, the world "regular" in this sense being taken to mean a physician who had been graduated from a reputable medical school and who followed orthodox medical precepts in his practice, as distinguished from a homeopathic physician, a herbalist, an allopathic physician, or one of the "steam doctors" so profoundly abhorred by early-day practitioners of competence.

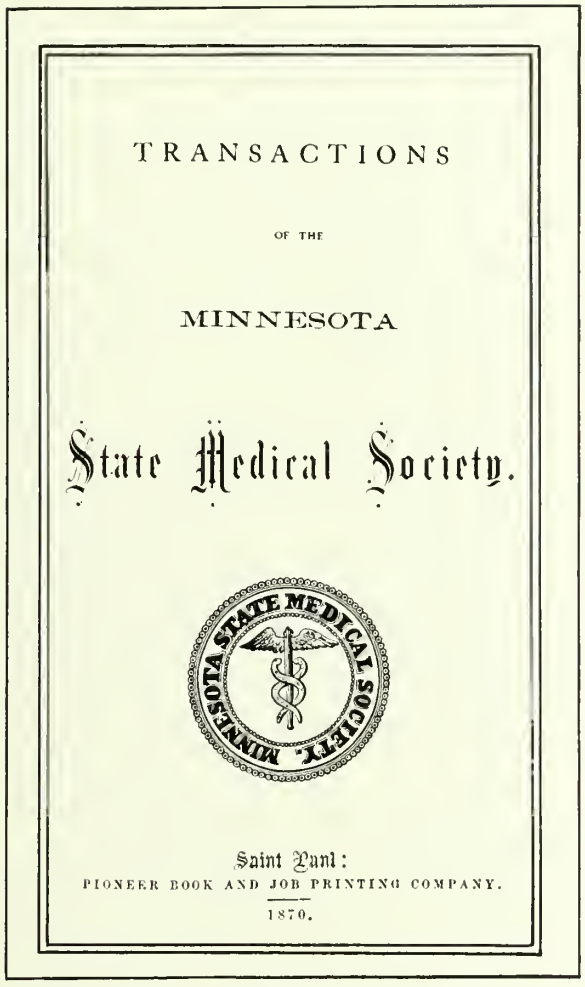
Armstrong[3] has demonstrated that the Minnesota State Medical Society (as it was called at its inception) was founded on July 23, 1853, and not in December of 1855, as the first volume of the *Transactions* (fig. 1) would have it.[4] This early society slipped into desuetude, and was organized once again on February 1, 1869, at a meeting in the old International Hotel in St. Paul. Dr. Samuel Willey of St. Paul, who had come to that city in October of 1852 "with but fifty cents in his pocket, and got his first patient while debarking from the boat; a man who fell and broke his leg,"[5] was elected president of the reorganized society. A semi-annual meeting held at Dresser's Hall at Owatonna on June 16, 1869, revealed the fact that there were only twenty-four "regular" physicians in Ramsey County as compared to twenty-one "irregular" practitioners, and only eighteen "regular" physicians in Hennepin County as compared to twenty-one "irregular" physicians.[6] In Boston in the same year there were only 275 "regular" physicians out of a total of 574 physicians in the city.[7]

It was at the second annual meeting of the Minnesota State Medical Society, held in the rooms of the Historical Society in St. Paul on February 1, 1870, that Dr. Stone's plan for a new medical journal received its impetus. In the evening session "The subject of the establishment of a Medical Journal in this State, was then brought before this society. Dr. A. J. Stone stated the arrangements which he had made, and expressed his confidence that such a monthly periodical might be established and sustained if the Society would give it its endorsement and encouragement. A lively discussion followed, in which Drs. Hewitt, Sweney, Willey, Stewart and others participated. On motion of Dr. Adams the members of the Society were recommended to subscribe liberally for Dr. Stone's Journal."[8]

Medicine in the United States in 1870 was largely traditional in nature, strongly imitative of and dependent on European medicine, and American medical journalism had followed a similar course since the founding in 1797 of the nation's first medical journal, the *Medical Repository* (fig. 2), a publication which in content and format so resembled the *Philosophical Transactions* of the Royal Society of London that the similarity could not have been fortuitous. Young Americans of the seventies still went to Edinburgh and London for a medical education, and American medical journals assiduously borrowed bits of material and often whole papers from foreign journals. English physicians in general did not have a high opinion of American practitioners. American medical editors did not hesitate to attack European medicine and medical institutions with singular ferocity, the editor of the *Boston Medical and Surgical Journal* having in 1835 lashed out at the board of faculty of Dublin University as being " a corporation of perfect spongers," and striking at no less a figure than William Stokes himself.[9] The stricture of the Whig, Sydney Smith, "What does the world yet owe to American Physicians or Surgeons?", appearing in Volume 65 of the *Edinburgh Review*, so infuriated the editor of the *Philadelphia Journal of the Medical and Physical Sciences* that he reproduced the hateful words on the title-page of his journal and kept them there until 1827, when his publication became the *American Journal of the Medical Sciences*.[10] Yet Dr. Bennet Dowler, a practitioner of New Orleans, probably echoed the private sentiment of most American medical authors when he wrote, "Where is the American who would not be pleased, nay grateful, to see his works republished, with or without annotations, in Great

*Much of the material used in this paper has been most generously supplied the author by John M. Armstrong, M.D., the recognized authority on medical history of Minnesota and the Northwest. Dr. Armstrong's material is now being utilized in another work now in progress in pursuance of certain studies in the Graduate School of the University of Minnesota.

†Division of Publications, The Mayo Clinic.



TRANSACTIONS

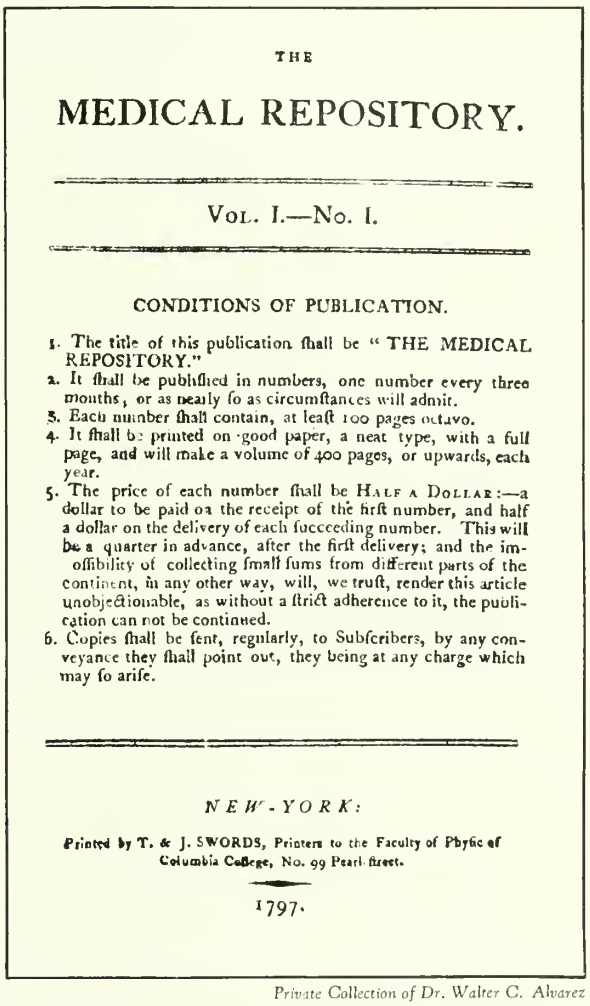
OF THE

MINNESOTA

State Medical Society.

Saint Paul:
PIONEER BOOK AND JOB PRINTING COMPANY.
1870.

Fig. 1. Title-page of the first volume of the Transactions of the Minnesota State Medical Society. It is set in curious old typefaces of the Nineteenth Century, unobtainable now except for the typeface used in the line "Transactions", which is Caslon.



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NEW-YORK:

Printed by T. & J. SWORDS, Printers to the Faculty of Phyſic of Columbia College, No. 99 Pearl-ſtreet.

1797.

Private Collection of Dr. Walter C. Alvarez

Fig. 2. One of the rarest of all historical items concerned with American medical journals: the original paper cover or wrapper which enclosed the first number of the Medical Repository. Numerous bound sets of this publication exist, but paper wrappers in which it was enclosed have almost entirely disappeared.

Britain?"[11] The transatlantic bickering was signalized in 1870 by an attack on American medical periodicals in general by the *Medical Times and Gazette*[12] of London, and by a statement in 1867 by Sir Dominic John Corrigan, then president of the British Medical Association, that the University of Pennsylvania would sell medical degrees for a small sum.[13] The great Samuel D. Gross[14] was stirred to wrath by the tenor of the squabbling, and the *Boston Medical and Surgical Journal*, observing sardonically that the London *Lancet* "during its early history, adopted a system of deliberate personal abuse for the purpose of increasing its circulation,"[15] felt it incumbent to point out that the degree of Doctor of Medicine could not be bought from Harvard University: *"it cannot be obtained by purchase, by any person."*[16]

Dr. Stone came from Boston in 1869, at the solicitation, as Flagg[17] said, of a New England physician who had settled in Stillwater for his health, the climate of Minnesota at that time being considered salubrious in the treatment of pulmonary tuberculosis and other conditions, as Flanagan[18] has pointed out. The year was hardly propitious for the establishment of a medical journal in Minnesota. Davis[19] wrote that "The census of that year showed a population for the state of 439,706 and all rail communications with Chicago and the east had been opened but two years before." Ulysses S. Grant was President of the United States. On the floor of the United States Senate, Minnesota's junior senator, Daniel Sheldon Norton of Winona, elected in 1864 as a "Union Conservative," was combating Senator Charles Sumner's resolution calling for repeal of the charter of the Medical Society of the District of Columbia because that society had refused membership to a Negro colonel who was a physician and a Union veteran of the war.[20] The linotype machine for the rapid and limitless production of type had not yet been perfected by Ottmar Mergenthaler,[21] and the editor of the *Galveston Medical Journal* complained that "there are not enough type in any office in the State to keep thirty-two pages standing over a few days, and often only a few hours,"[22] a difficulty which Dr. Stone himself, with nothing but hand-

THE NORTHWESTERN

Medical and Surgical

JOURNAL.

A MEDICAL MONTHLY DEVOTED TO THE INTERESTS OF THE NORTHWEST

EDITED BY

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Surgeon to St. Joseph's Hospital

VOL. I.

18303
St. Paul:
PUBLISHED MONTHLY BY THE EDITOR.
1870-1.

Fig. 3. Title-page of the first volume of the Northwestern Medical and Surgical Journal. The volume was set entirely by hand, and was printed by steam power.

set type at his disposal, was soon to encounter. Steam had been applied to the printing press, but the photo-engraving process for the manufacture of engravings in zinc and copper had not yet been evolved. The Surgeon-General of the United States Army announced that 100 pages of the surgical portion, and 657 pages of the medical portion, of the first volume of the *Medical and Surgical History of the War of the Rebellion* had been printed, and that it contained "woodcuts, lithographs, and chromo-lithographs."[23]

Dr. Stone in 1869 had sent out a prospectus of his new journal. The *New York Medical Journal*, then edited by Dr. Edward S. Dunster and published by Daniel Appleton, rebuked Stone for the prospectus, saying with ill-disguised hostility that "We fail to see the force of the argument, and think the interests of the profession of the Northwest would be better met by giving their influence and material aid to sustain and advance the already-established and valuable journals published in the Great West, if not immediately in the Northwest."[24] The *Medical Record*, on the other hand, had kinder

EDITORIAL.

In presenting to the Profession of the Northwest the first number of the "NORTHWESTERN MEDICAL AND SURGICAL JOURNAL," we can but ask a kindly forbearance in any criticisms to which we may lay ourselves liable. Dedicating our enterprise, as we have, to the medical interests of the Northwest, we shall labor faithfully for their advancement, without allowing or showing any sectional prejudice or favor.

Our columns will be open at any time to the Profession, and we sincerely hope that any physician will feel at liberty to write for our publication letters pointing out and correcting any violation of the code of ethics, or in any way correcting the tendency to charlatanism, which, to a certain extent, prevails in this State, as in all the newer, and some of the older, States of the Union.

The physicians of the Northwest can greatly aid us by securing for us subscriptions and advertisements, and by contributing medical notes and clinical reports. We are ready and willing to pay liberally for all worthy articles.

Making no promises for the future, except that we shall work faithfully for the best interests of our professional brethren, we submit our first number to their kindly notice.

Fig. 4. Facsimile of the first editorial appearing in the first number of the Northwestern Medical and Surgical Journal.

words when the first issue of the *Northwestern Medical and Surgical Journal* appeared in June of 1870; it said that the periodical was "ably edited by Alexander J. Stone, M.D., of St. Paul."[25] It is of interest that at the same time Dr. Stone was starting his new venture in medical journalism, Colonel Daniel A. Robertson of St. Paul was editing a new agricultural periodical, the *Minnesota Monthly*, which unfortunately survived only to the extent of thirteen numbers, issued in 1869 and 1870, in St. Paul.[26]

The first number (fig. 3) of the *Northwestern Medical and Surgical Journal* appeared in June of 1870. It was small, having only twenty-four pages and containing no illustrations of any kind. The editorial page displayed Dr. Stone's introductory message to physicians of the Northwest (fig. 4) and a commentary on the death of Sir James Y. Simpson, in which it is revealed that Dr. Stone had been entertained at the home of Queen Victoria's celebrated *accoucheur* "some two years since."[27] A paper called "Case of Pelvic Haematocele," by Lauchlan Aitken, M.D.,[28] who had been Simpson's assistant in Edinburgh, further reflected Stone's European experiences and acquaintances. The cost of a subscription to the journal was $3.00 a year in advance, and single copies were 35 cents. It would appear that the journal was printed by David Ramaley at 28 Minnesota Street in St. Paul. Ramaley later organized the Ramaley Publishing Company, situated at 49 East 4th Street in St. Paul. The second number of the *Northwestern Medical and Surgical Journal* contained the glossy photographic print of an infant on whom Dr. Stone had operated for congenital malposition of the bladder, an interesting illustration because it antedated the photo-engraved illustration in use today. The printer or his men simply printed the legend for the picture on a page of the same size as the others, then pasted the glossy photographic print to the page by hand. In the third number, issued for August of 1870, a woodcut appeared for the first time, to illustrate a paper by Dr. Franklin Staples of Winona on "Treatment of Fractured Clavicle."[29]

Dr. Stone removed to St. Paul in October or November of 1870, the move from Stillwater making it neces-

sary to omit the number for December of that year, which was never published. Instead, as Stone explained, a combined December-January number was printed, and yearly subscriptions were extended by one month to give patrons twelve numbers.[30] At the end of the first year of publication, Stone found it possible to write: "The Journal has been more than self-sustaining during its first year, and is placed upon a sound financial basis, for years to come. Commencing as a twenty-four page pamphlet, it has reached a size of thirty-six pages, and will commence its second volume with forty pages, and a good prospect for another increase to sixty pages, during the coming year. . . . We don't wish a pecuniary profit from the Journal, but intend to apply all money received for subscriptions, to the purpose of enlarging and improving the Journal."[31] A billhead in the possession of the author, printed with Dr. Stone's name and giving the address of his office as "Corner of Jackson and Third Streets" in St. Paul, was sent to Dr. J. B. McGaughey of Winona as of July 31, 1871. This billhead evidently is one that Dr. Stone used for his patients, for the subscribers to his journal, and for advertisers in the journal, since it has one line allotted for fees for professional services, one for subscriptions to the periodical, and one for listing charges for advertising in the publication. At one end is the ominous announcement that one Francis Bingham was Dr. Stone's collector, beneath the phrase, "ALL BILLS COLLECTED MONTHLY."

In the issue of the *Northwestern Medical and Surgical Journal* for October of 1871 is an editorial on the great Chicago fire, urging physicians in Minnesota and the Northwest to send clothing, books and instruments to practitioners in Chicago.[32] In the issue for August of the same year, Thomas Lowry of Minneapolis purchased a half-page of space to announce the "Minneapolis Agricultural and Mechanical Fair," of which he was secretary. The advertisement promised that $10,000 in premiums would be offered.

Approximately two years after Dr. Stone began publication of the *Northwestern Medical and Surgical Journal,* he sold it to Dr. H. C. Hand of St. Paul, who formed a partnership with Dr. H. H. Kimball. Hand became editor; Kimball became business manager. These two physicians conducted the journal until June of 1874, in which month the last number of the periodical appeared. A strikingly ironic news note appears on the final page of the final issue of the moribund journal: "Our new abortion law has borne its first fruits by the conviction on Tuesday, June 9th, 1874, of one J. Owens who procured a pregnant female to take a medicine known as 'Clark's Female Periodical Pills', an abortion following."[33] It was this same "J. Owens," actually a graduate of a reputable medical school, and later the possessor of License No. 1 issued under authority of the licensing law of 1883,[34] who founded the next medical journal published in the state, the *Northwestern Lancet,* of which the first number was that for October 1, 1881. Armstrong[35] has revealed that Dr. Owens was not permitted to state his version of his misfortune of 1874, and eventually he became a much-respected practitioner in St. Paul, and a president of the Ramsey County Medical Society.

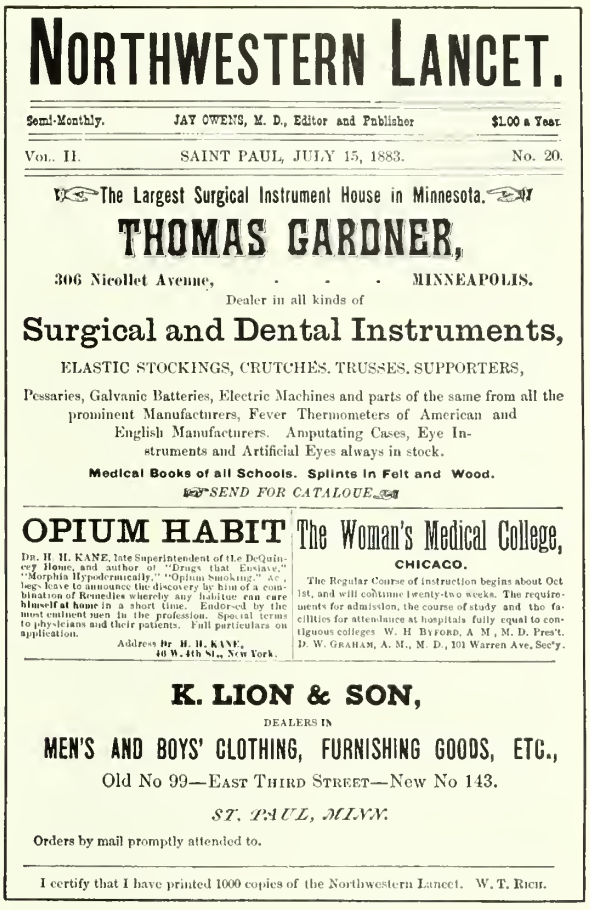

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Fig. 5. Cover of the Northwestern Lancet as it appeared in the summer of 1883. The forerunner of the modern typeface known variously as Stymie, Karnak, Obelisk and Girder is apparent in the lines "OPIUM HABIT" and "K. LION & SON."

The *Northwestern Lancet* was printed by one W. T. Rich in St. Paul, and 1,000 copies of each number were issued. It was a semi-monthly publication costing but $1.00 a year, and it was edited in a sprightly, familiar vein more suggestive of a frontier weekly newspaper than of a medical journal (fig. 5). Davis[36] wrote that this journal came under the editorship of Dr. Charles B. Witherle of St. Paul in November of 1884, and that in September of 1886 Dr. Alexander J. Stone, who had been a member of the "Editorial Corps" of the periodical, re-entered the field of medical publishing once again by buying Dr. Owens' rights in the *Northwestern Lancet* "for the sum of one dollar." Davis, who is still living in St. Paul as this is written, never could determine as a certainty that the dollar changed hands, but he thought the omission, if such there was, was "pardonable, considering that for a while the *Lancet* ran behind financially and Dr. Stone had to put his hand into his pocket twice a month to make up the deficit."[37]

The last number of the *Northwestern Lancet* edited by Dr. Witherle appeared on October 1, 1886. After that date it was edited in St. Paul by Dr. Stone, first

at 309 Wabasha Street and later at 353 Washington Street. Dr. Stone obtained Dr. William Davis of St. Paul as his associate editor, and Davis served in that position until December of 1899. In the *Northwestern Lancet* for January 1, 1900, appears a solicitous editorial by Dr. Stone on the subject of Dr. Davis' retirement from the publication, and also an announcement of the engagement of Dr. Howard Lankester.[38] In the year 1899 the editorial offices of the *Northwestern Lancet* were situated at 107 East Sixth Street at St. Paul, and the business offices were situated at 734-735 Lumber Exchange Building, in Minneapolis, where they were to remain for more than thirty years.

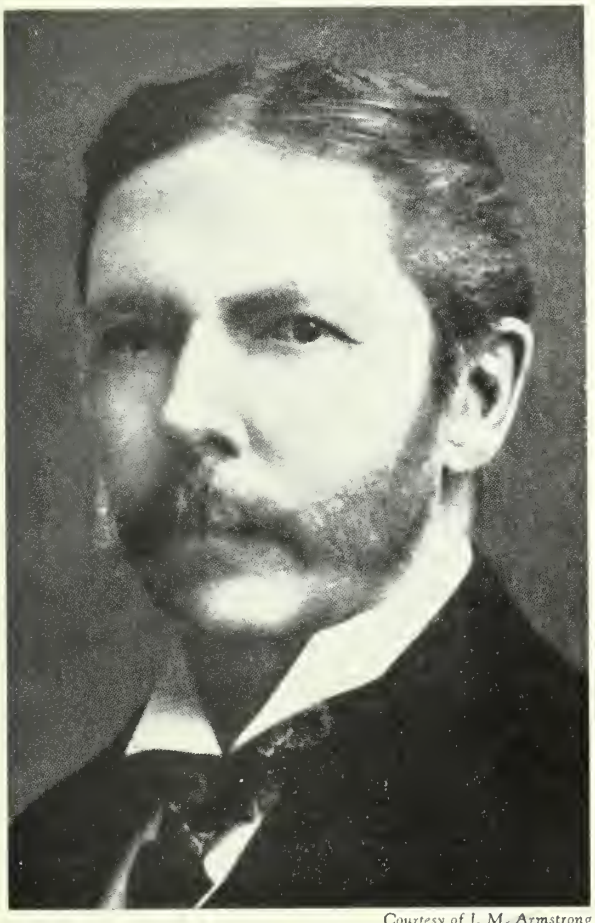
In December of 1887 a new influence entered into the conduct of the *Northwestern Lancet*. William L. Klein, a young man 36 years old, a graduate of Phillips Academy and Cornell University, was engaged by Dr. Stone as business manager of the journal, and the rest of his life was to be spent in making the publication one of the outstanding periodicals in the Middle West. Klein was a scholar, and it has been said that he edited the manuscripts for the *Northwestern Lancet*. His insistence upon correct grammar and rhetoric is indicated by the fact that he wrote a book called *Why We Punctuate*, and the Lancet Publishing Company printed it in 1897, offering it for sale at $1.00. Klein died at his home on August 20, 1931, keenly interested in the journal to the last, in spite of the fact that in 1929 he had disposed of his interests in it.[39]

In 1900 Dr. Lankester retired from the associate editorship of the *Northwestern Lancet*. The editorial offices in that year were situated at 515 Dayton Building in St. Paul, with a business office at 120 Lowry Arcade in the same city, and Klein's office was at 734-735 Lumber Exchange Building in Minneapolis. Dr. William A. Jones, who had grown to manhood in the village of St. Peter, where his father and mother had experienced all the terrors of the Indian outbreak of 1862, became editor of the *Northwestern Lancet*. Dr. Stone likewise withdrew from his association with the publication, and his farewell editorial, appearing in the issue for December 15, 1900, begins with these melancholy words: "With this issue of the Lancet my connection with journalism in the Northwest ceases." But his pardonable nostalgia was tempered by his praise for the new editor, who was to assume his position on January 2, 1901: "That the editorial management of the Lancet is to be placed in the hands of Doctor W. A. Jones is sufficient guarantee that a high standard of ethical journalism will be maintained."[40]

Under the combined directorship of Dr. Jones and Mr. Klein the *Northwestern Lancet* prospered. Purchased in 1905 by Mr. Klein, it was moved to Minneapolis, and in the same year (Volume 25, Number 22) the subtitle *Journal of the Minnesota State Medical Association* was added. In 1911 (Volume 31) the subtitle was eliminated and the publication assumed the designation, JOURNAL-LANCET, by which it is known today. A semi-monthly journal from the year 1881, it reverted to the monthly status of the old *Northwestern Medical and Surgical Journal* on January 2, 1936, and is published today as a monthly journal. In July of 1907 the *Northwestern Lancet* began to publish the transactions of the South Dakota State Medical Association. In 1912 the transactions of the North Dakota State Medical Association appeared in the journal, and in 1934 it began to publish the transactions of both the Medical Association of Montana and the American Student Health Association. Today it is the official journal of all four associations, as well as of several other regional or special societies.

The medical journals that have appeared and disappeared since the JOURNAL-LANCET was established are indicative of the impermanency of periodicals in general and of the precarious destiny of medical journals in particular. There was the *Minnesota Medical Mirror*, published in Cambridge, Minnesota, by Dr. N. M. Cook, a practitioner of the eclectic school of medicine, from December of 1881 to March of 1885. Dr. Cook, who at one time published the *Isanti County Press* in Cambridge, died in Princeton, Idaho, in 1927. The *Minnesota Medical Monthly*, "devoted to the interests of homeopathy and its practitioners," and edited by Dr. William E. Leonard, was published in Minneapolis in three volumes, from May of 1886 to October of 1888.** The *Minnesota Medical Journal* was started in Minneapolis in January of 1889 by Edward N. Fishblatt. Only one number (13) was issued. Fishblatt, who was interested in medical advertising work, also issued the *Minnesota Medical and Surgical Journal* in Minneapolis from August of 1886 to March of 1887 (Numbers 4 to 11 of Volume 12). This publication purported to be a continuation of the *New York Medical and Surgical Journal*, and was apparently strongly Democratic in politics, as the *Northwestern Lancet*[41] pointed out in 1886, in a sarcastic editorial note: "The *Minnesota Medical and Surgical Journal*, formerly the *New York Medical and Surgical Journal* publishes in its last number a portrait and eulogy of Dr. A. A. Ames, the democratic candidate for governor. It is somewhat unusual for medical journals to enter the political arena, even when the nominee of a party is a physician. We hope the republicans will not be disheartened, even in the face of the *Journal's* modest claim on its cover that it has 'the largest circulation of any medical journal published'." The *Medical Dial* was published in Minneapolis by Dr. J. W. MacDonald from December of 1898 to December of 1903, and was absorbed by the *Northwestern Lancet*. The *Medical Argus* was published in Minneapolis as a homeopathic organ from July of 1890 to January of 1898. The editor, Dr. Frank Fisk Casseday, was a graduate (1879) of the Hahnemann Medical College and Hospital of Philadelphia who practiced in Minnesota under the exemption law of 1883. He died in Portland, Oregon, in 1932.

**According to an editorial note in the *Minnesota Medical Monthly* for May 1, 1886 (Volume 1, page 24), both the *Minnesota Medical Monthly* and the *Minnesota Medical and Surgical Journal* were printed in the job plant of the *Minneapolis Tribune*.



Courtesy of J. M. Armstrong

Fig. 6. Dr. Alexander J. Stone.

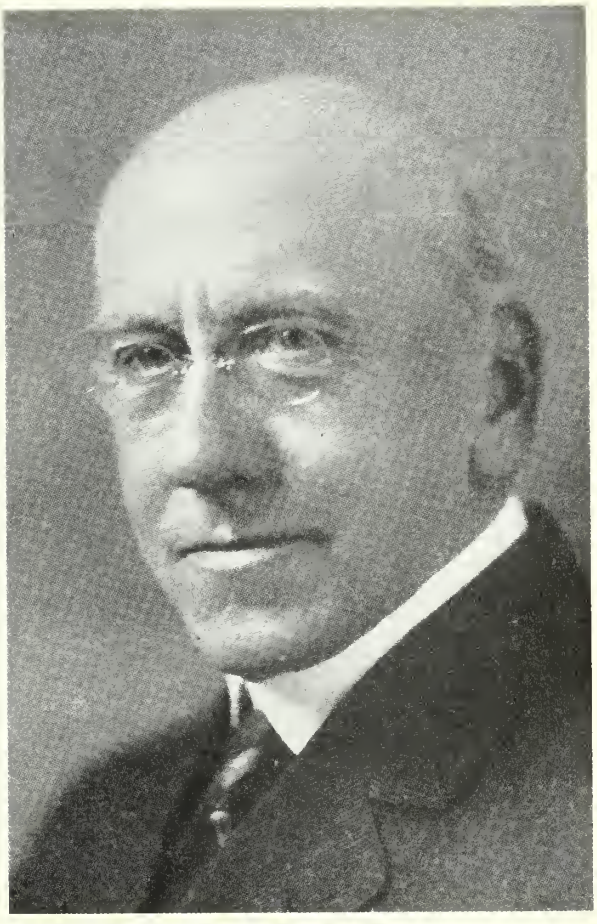


Fig. 7. Dr. William A. Jones.

Alexander J. Stone††

Alexander J. Stone (fig. 6) was born on September 7, 1845, at Augusta, Maine. His boyhood was spent in New England, and he was graduated in 1867 from the Berkshire Medical College at Pittsfield, Massachusetts, a school which apparently became extinct in the year of Dr. Stone's graduation, after having graduated a total of 1,138 students.[42] After his graduation, Stone spent some months of special study in Europe, where he became acquainted with Sir James Y. Simpson in Edinburgh. The *Boston Medical and Surgical Journal*[43] recorded that Stone was married to Miss Helen S. Sewell, at Wiscasset, Maine, on December 15, 1868. He became assistant in practice to Dr. Horatio R. Storer, of Boston, and was assistant surgeon at the Franciscan Hospital for Women in Boston. In 1866, while still a medical student, he developed a splint to prevent contraction after burns.[44] In 1868 he developed a new type of surgical knife for the operative treatment of phimosis,[45] and in 1869 he came to Minnesota, where he settled in Stillwater.

Ritchie[46] said that Stone as a young man in Maine had been a confirmed Democrat, and that he often stumped the state for his party. In Minnesota he quickly became a champion of orthodox medicine, chiding homeopaths and others in the columns of his journal. Dunsmoor[47] said that wherever he happened to be, if he identified himself as being from Minnesota, "the almost invariable first query was, 'How is Stone?' " That Dr. Stone was an excellent surgeon was attested by Abbott,[48] who said that "Dr. Stone was one of the most graceful wielders of the knife that it had ever been my privilege to see. Using the knife and scissors with the left hand almost as well as with the right, he certainly was a beautiful operator." Abbott's testimony is all the more remarkable in view of Armstrong's[49] assertion that Stone had "a Dupuytren's contraction of the fingers of both hands and congenital dislocation of both hips, which last he concealed by always wearing a frock coat." In addition to his great service to the state in giving it its first medical journal, Stone performed several other feats of note during his career in medicine. He was the first physician in Minnesota to specialize in gynecology. He founded the bacteriological

††Since this biographic sketch of Dr. Stone was written, a letter has been received from his son, Mr. John Sheppard Stone, of Chicago. Mr. Stone wrote that his father was born in Auburndale, Massachusetts, and that he was graduated from Bowdoin College and the Harvard Medical School. Mr. Stone further wrote that his mother's name was Helen Sheppard Sewall, and not "Sewell," as the *Boston Medical and Surgical Journal* reported it. Dr. Stone had three sons, John Sheppard Stone, born in Stillwater; and Frederick W. Stone and Harry H. Stone, the latter of whom were born in St. Paul and died there in infancy. Mrs. Stone was born in Somerville, Massachusetts.

laboratory of the City Health Office of St. Paul, and was health commissioner of that city for eight years. He was Surgeon-General of the State of Minnesota at the time of his death. He was one of the founders of the old St. Paul Preparatory Medical School and of the St. Paul Medical School, which in 1888 became a part of the University of Minnesota College of Medicine. At the university Stone was professor of gynecology and chief of the department at his death. He served as president of the Minnesota State Medical Association in 1882, the Association of Military Surgeons and the Association of American Medical Editors. He was elected to the vice presidency of the American Medical Association. In 1887 the University of Iowa conferred on him the degree of Doctor of Laws. He last attended a faculty meeting at the University of Minnesota on May 12, 1910, and he died on July 16 of that year, in St. Paul. Dr. John M. Armstrong[50] of St. Paul, who now possesses Dr. Stone's desk and who knew him well, has written of him: "The writer does not feel that he is equal to the task of eulogizing this gifted man. It was a pleasure to know him." Beard[51] called him "that scholarly gentleman,—that prince of good fellows, —the late Doctor Alexander J. Stone."

William A. Jones

Dr. William A. Jones (fig. 7) was a native Minnesotan. As has been said, he came to Minneapolis from the town of St. Peter, where he was born in 1859. He came of lineage that extended back to Colonial times in America, both his grandfathers having been soldiers in the Revolutionary War. His father had emigrated to the village of St. Peter in 1854, where he met Dr. Jones' mother in 1858.

Young Jones attended grade and high school in St. Peter, and became a clerk in his father's drug store at the age of 14. In 1881 he was graduated from the University of the City of New York Medical Department (now the New York University, University and Bellevue Hospital Medical College). He returned to St. Peter to become assistant physician at the State Hospital for the Insane at that town. In 1883 he came to Minneapolis to engage in general practice until the year 1886, when, after his marriage to Miss Annie R. Johnson of Denver, he went to Europe for special postgraduate studies. In 1889 he was appointed instructor in nervous and mental diseases in the University of Minnesota College of Medicine, and he became full professor in that specialty in 1900, retiring in 1919. In 1890 Dr. Jones was appointed to the Board of Trustees of the State Hospitals for the Insane, a post he occupied until 1894. In 1914 he was chosen chairman of the Section on Nervous and Mental Diseases of the American Medical Association, and during 1928-1929 he served as vice president of that association. In Minnesota, he was elected president of the state medical association, the Hennepin County Medical Society, and the Minnesota Academy of Medicine, as well as of an organization which he had helped to found, the Minnesota Neurological Society. He was president of the Minnesota State Board of Health from January 10, 1911, to December 31, 1918.

Dr. Jones was a skilled player of the pipe organ, and such an instrument was installed in his home. An indefatigable worker, he thoroughly understood the innumerable difficulties involved in the regular publication of a medical journal, and he seems to have been almost as well versed in the economic problems of publishing as he was in the editorial problems. Hamilton[52] wrote of him: "All his life, he was a hard worker and he had few vacations—the last in 1921—and such as he had were purely urban. He cared nothing for fishing, hunting, camping or motoring, and his ideal vacation consisted in a trip to New York, where he spent his days in the top story of a hotel reading and his evenings at the theater. He had a high intelligence and a ready wit and repartee and was always popular at medical meetings where he often presided easily and ably. To the very last he carried with him his unquestionable courage and cheerfulness and his refusal to accept the role of an invalid."

Dr. Jones died on January 15, 1931, at Northwestern Hospital in Minneapolis. He bequeathed his extensive medical library to the Hennepin County Medical Society.

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Botulism in South Dakota*

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BOTULISM, while not new, is nevertheless a relatively rare disease. In South Dakota *Cl. botulinum* has been unknown and no authenticated outbreaks of botulism have ever been found until recently, despite the fact that a great many people still can their own vegetables. Not only has botulism been absent, but several studies by various investigators have failed to isolate the organism from the soil of this state. Meyer and Dubosky,[1] in 1922, found the organism present in the soil of nearly every state in the union except South Dakota.

Later studies by bacteriologists here and from neighboring states all failed in isolating the organism from the soil of South Dakota. These results led people to assume that there was little or no danger of botulism developing in this state from the consumption of home canned foods.

The first evidence of the presence of the botulism organism was discovered in March, 1935, near Vermillion and was therefore personally supervised and examined by one of the authors (C. A. H.). Fortunately, the farm on which the epidemic occurred was run by a very intelligent man, and no human cases of botulism developed. The vehicle for the toxin was home-canned corn which showed some signs of spoilage. This can was discarded and eventually fed to the chickens. Typical cases of "limber-neck" developed among the chickens and by the time the laboratory was notified 70 chickens had died and about that many more were showing definite symptoms of botulism. The farmer, on his own initiative, set up a satisfactory experiment. Knowing that the trouble came from either the corn or dried horse meat, he obtained two chickens from a neighbor, penned each separately and fed one the corn and one the dried meat. In 24 hours he saw definite signs of limber-neck in the corn-fed chicken and in 48 hours this chicken was dead. The other chicken was alive and well. Altogether, the farmer lost about 125 chickens and one goat.

No samples of this particular can of corn could be had but several jars from the same batch were obtained and taken to the laboratory for study. From these was isolated *Cl. botulinum*, type A, the study of which will be discussed later.

Samples of soil from various areas on this farm were collected and examined for the presence of *Cl. botulinum*. The organism was isolated from the soil in the field where the corn had been grown. This farm is on the low lands and is occasionally flooded by the waters from the Missouri river. Whether the soil became inoculated by the spores in this manner is a question. There are, however, two other possibilities: first, a number of years ago this farm was a nursery, and trees, shrubs and plants were shipped from various parts of the country and set out on this land. Second, the severe dust storms which this state has experienced for several years might easily account for the introduction of the organisms. In this connection, it should be mentioned that a large number of specimens of this wind blown soil were collected in various parts of the state east of the Missouri river, and *Cl. botulinum* was never isolated. Regardless

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1. Meyer, K. F., and Dubovsky, Bertha J., Journal of Infectious Diseases 31:559, 1922.

of these negative tests it is our opinion that wind has played some part in the dispersion of these organisms.

The second outbreak of the disease occurred in September, 1936, and resulted in the first authentic human outbreak of botulism in this state.

REPORT OF CASES

On September 14, 1936, at noon, in a small town in the northern part of the state, five people sat down to a meal consisting of potatoes, boiled bologna sausage, home-canned string beans, bread, butter and coffee. The family consisting of C. A., owner of a small country hotel, his wife, M. A., and three boarders, A. J., J. R. R., and J. S., all sat down together at this meal. The beans, home-canned by the so-called cold-pack method, were noted to be slightly foamy and faintly rancid in odor upon opening the Mason jar in which they had been prepared. The landlady and cook, Mrs. A., questioned their edibility but J. R. R. assured her that they would be all right if rinsed off in cold water, whereupon she rinsed them at the kitchen sink through five changes of cold water and served them without further preparation. These beans had been purchased from a truck distributing vegetables from Minnesota and originally offered for sale in the small store attached to the hotel. The remainder had been thriftily processed by the landlady. They were, therefore, wilted and stale at the time of canning. A boarder, J. S., was still able to detect a rancid odor when the beans were passed to him, so he took none of them. He described the odor as being somewhat like limburger cheese, but not strong enough to be offensive. He was the only one who ate none of the beans, although he ate heartily of all the other food; likewise he was the only one of the five to be alive and well 42 hours later.

A physician was called 22 hours after this meal was eaten, arriving about 10:30 a. m., September 15, 1936. Upon his arrival he found two patients sitting in the hotel lobby. They were in a jocular mood and made light of their trouble, which consisted of weakness, dizziness and visual disturbance since the early morning hours. A third member of the group walked into the hotel and asked if he were sick, saying he had partaken of the meal that seemed to be causing all the disturbance. One patient was already in bed, having been unable to arise that morning. All were ordered to bed and, after a brief examination to confirm a diagnosis already made from symptoms detailed over the telephone, energetic attempts were made to secure botulism antitoxin from Jensen-Salisbury Laboratories, Inc., in Kansas City. It was soon evident that the intoxication was of a fulminating variety and had antitoxin been available when the physician first arrived, it would not, in all probability, have averted a fatal outcome. A consultant, Dr. J. E. Curtis of Lemmon, was called early in the case, and confirmed the diagnosis and assisted in the care of the patients. A brief description of the individual cases will now be attempted.

Case No. 1. J. R. R., male, aged 46, always well and strong, had eaten very freely of the beans. At 10:30 a. m. when the physician first saw him, he had a slight ptosis of one eyelid; his pupils were moderately dilated and reacted to light but poorly. He complained of diplopia which had existed since early morning. He had arisen about 6 a. m., vomited a couple of times, noted that he was dizzy and after a short time had come to the hotel to see how his friends were feeling. While there was no speech difficulty at the time, an attempt to take a dose of castor oil nearly strangled him. An hour later his speech was difficult, motion of the tongue being practically nonexistent, and weakness so pronounced that he was compelled to stay in bed. At this time he refused to attempt any communication with us by writing or other signs, and apparently felt that he was fatally stricken. His pulse and temperature were normal until about 3 p. m., when the pulse gradually accelerated until at the time of his death it was about 140 per minute. The castor oil that he had taken, and numerous enemas, were without any effect whatsoever. He died of respiratory paralysis about 5:30 p. m.; his heart continued to beat three or four minutes after his breathing ceased. He lived 29½ hours after eating the beans and 7 hours after being asked to go to bed. He had two hypos of morphine during this time but with practically no effect.

Case No. 2. C. A., male, aged 26, hotel-keeper and butcher, a husky man 5 feet 11 inches tall and weighing about 190 pounds, was quite an athlete. He was sitting in the hotel lobby upon the physician's arrival and was of good color and in a jovial mood, saying he was on "a cheap drunk." He had arisen about 7 a. m., after being a little uneasy during the latter part of the night. He vomited a little, had a bowel movement, was dizzy and a trifle more tired than usual. He did not eat any breakfast. Soon he noted that his vision was disturbed; this consisted mostly of diplopia. A slight ptosis of the left eyelid was noted and a slight droop to the left corner of the mouth, unequal mydriasis and sluggish pupillary reaction to light. He went to his room without help and went to bed under protest at 11 a. m. He took 2 ounces of castor oil without difficulty. At noon his tongue was beginning to be difficult to use, his mouth and throat dry; both eyes showed ptosis; his pulse, which was 84 when he went to bed, was becoming more rapid and he was developing general muscular weakness. His temperature was normal throughout his illness. There was great prostration through the late afternoon and up to the time of death, and it was impossible for him to swallow or speak during the last six hours of life. Enemas and oil were without effect. He did not vomit again. He received two hypos of morphine and an ampule of sodium-amytal with little or no effect. He died at 11 p. m. of respiratory paralysis. He was restless and apprehensive until the end and had a short, clonic spasm of both legs and feet about 5 minutes before death, kicking the bed with great vigor and rapidity. He showed a great deal of post-mortem lividity.

Case No. 3. M. A., female, aged 25, a strong, healthy German girl, childless through five years of married life, never sick but highly susceptible to *Rhus toxicodendron*. She ate rather freely of the infected beans and was in some distress early the next morning. About 5 a. m., she vomited and complained of dizziness and extreme prostration. She had a bowel movement about this time also. She did not get up on account of her weakness. Upon examination she appeared pale and gravely ill, yet she out-lived her husband who appeared a much better risk. She had such a pronounced bilateral ptosis that she appeared asleep or drowsy all the time. She took castor oil at 11 a. m. with slight difficulty, retaining the same, which as usual failed to give any results. Her pulse was slightly weak, the rate being 86; temperature was normal. She was not so apprehensive or restless as the others. There was difficulty in phonation, but it seemed to be due to general weakness rather than any paralysis of her tongue or throat. The pupils were both dilated but unequal, and the light reflex was greatly diminished. Her speech and swallowing difficulties did not progress so rapidly and were not so apparent as in Case No. 2, but both swallowing and speech became impossible several hours before her death which came from respiratory paralysis at 11:30 p. m. There was no post-mortem lividity in her case, and her face was a picture of repose and serenity in death. She was more decidedly prostrated and helpless through her illness than any of the others, but retained her faculty of speech and swallowing longer than the others.

Case No. 4. A. J., male, aged 23, a rather frail youth with astigmatism. He partook very sparingly of the beans, eating less than a teaspoonful of them. He arose early the next morning feeling only slightly indisposed. He had a bowel movement as usual, ate a little cereal for breakfast and went to work at the general store where he was employed. His appearance was one of perfect health at the time he was first seen by the physician, with the exception of a slight dilatation of the pupils, which reacted poorly to light. He stated that he had stopped work because he had been bumping into show cases in the store. He had attributed this to a new pair of glasses which he had just put on that morning. However, since he was already complaining of double vision, he was ordered to bed at once for observation. He had had no gastric distress, had not vomited, and was with difficulty convinced that he was sick enough to go to bed. In less than an hour his diplopia was distressing and he had some dryness of the throat and mouth. He took his 2 ounces of castor oil easily. This was retained until about two hours before his death when it was vomited, this being his first emesis. His symptoms were in the main similar to those exhibited in the three preceding cases, except that he

showed more restlessness and anxiety. This may have been due to the fact that he lived almost six hours longer than any of the others. In addition to sedatives, he was kept on coramine given hypodermically, but whether his life was prolonged for this reason is doubtful as he had eaten by far the smallest portion of the beans. He died of respiratory paralysis about 6 a. m., 42 hours after partaking of the meal and 22 hours after the onset of symptoms.

Family and past medical history of above cases were intentionally omitted as being without interest. In review of these cases, the striking symptoms consisted of general weakness, dizziness, diplopia, paralysis of the tongue and pharyngeal muscles, early ileus, unequal bilateral mydriasis that did not remain of uniform intensity, failure of pupils to react to light, blepharoptosis, restlessness, apprehension and death from respiratory paralysis. The temperature was normal in all cases throughout the disease, the breath foul, the pharynx dry and covered with tenaceous mucus, the pulse normal until just a few hours before death. There was not enough gastro-intestinal disturbance in any case to be noteworthy, and there was an entire absence of pain throughout their sickness. The cases, judging from a review of the literature, were more fulminating than the average but otherwise conformed largely to other cases studied.

An interesting feature of this outbreak, confirming the diagnosis, was observed among the chickens ranging the yard back of this hotel. Several were found dead 24 hours after the beans were served, and 20 or more in 48 hours. This intoxication in fowls is called "limber-neck." It is not known whether the remnant of the beans were fed to these fowls or not, but they were in the habit of drinking from a tiny puddle into which the kitchen sink drained and this may have contained a lethal measure of the toxin from the rinsing of the beans.

In both outbreaks the jars from the same batch of home-canned vegetables were sent to the laboratory. On external appearance both the corn and the string beans appeared in good condition; but both, on opening, showed definite signs of spoilage. This was evidenced by a rancid odor and much gas pressure; in fact, on opening the string beans the gas pressure in the jar was so great that bean juice squirted out several feet in the air.

Guinea pig feeding was undertaken immediately with the canned vegetables to determine if *Cl. botulinum* toxin were present and if so, its type. It was soon evident that both the corn and the string beans contained a very potent toxin. By protection tests using antitoxin, it was soon found that this toxin was in both instances *Cl. botulinum,* type A.

Isolation of the organisms from both products was best accomplished by means of the constricted tube. Marble seal dextrose broth was boiled to drive out the air and after a quick cooling the tubes were inoculated, getting as much below the marble seal as possible. Crystal violet, 0.5 cc. of a 1/1000 dilution, was then added to the portion above the seal. This method keeps down aerobic growth above the seal. Since the crystal violet diffuses slowly down into the portion under the seal, it and the anaerobic conditions result in a culture, after several passages, of nothing but anaerobes. The problem then becomes one of isolating the anaerobes and picking colonies until a pure culture of *Cl. botulinum* is obtained. *Cl. sporogenes* caused some difficulty; but using the anaerobic method of Weiss and Spaulding, it was possible to make streak plates and thus easily separate these organisms.

Pure cultures were thus obtained from the corn, the beans and the chickens in the "limber-neck" outbreak as well as from the soil of the farm where this outbreak occurred.

It is interesting to note that during the plating of these cultures to obtain a pure culture, several types of colonies were obtained. This was particularly true in pour plates. The three types found were (1) round, dark and granular colonies, (2) lenticular colonies and (3) a spreading type of surface colony. This mixture of colonies was thought at first to be the result of the growth of other organisms, especially in the case of the spreading colony. However, when these colonies were very carefully picked, plated and repicked several times, this mixture of colonies was still present. From the careful picking resulted growths that were predominantly one type of colony and yet all three, when tested on guinea pigs, proved to be powerful toxin formers and typical *Cl. botulinum,* type A. Apparently variation in colony type is possible among the clostridia.

The other characteristics of these strains of *Cl. botulinum,* type A, were fairly characteristic. They were gram-positive rods, varying in size from 0.5 to 1.5 mu. The spores were numerous in all media, were larger than the rod, oval and terminal forms. They all fermented rapidly.

The one interesting thing to be pointed out here bears out the clinical results. In the case of the organism causing the human outbreak it was noticed that the action on the humans was very rapid and fulminating. Laboratory tests, both with the beans and five cultures of this organism, showed a very powerful toxin. As little as a drop or two of the broth from a culture of this organism, when fed to a guinea pig, resulted in the pig's death within four hours. This is more rapid a death than is to be expected with most *Cl. botulinum* toxins.

Previous to the two outbreaks of botulism here described, two other outbreaks were reported in South Dakota; but they were never confirmed by laboratory examination. Dr. A. E. Bostrum, of the State Board of Health reported several cases occurring in the northeastern part of the state. The other outbreak was in the Black Hills; Dr. Ivan C. Hall of Denver, in a letter of June, 1934, said:

"I have one record of botulism in South Dakota at Spearfish, in the family of Mr. A. B. in February of the present year, presumably due to cold-pack home-canned beans. I am wondering if by any chance this is the same outbreak as that you mentioned. We examined some of the jars of beans other than the ones that were thought to be responsible and with entirely negative results, and the diagnosis was not confirmed by any of our examinations."

While there is no definite proof that the appearance of *Cl. botulinum* in this state is due directly to the dust

storms of the last few years, there seems to be enough circumstantial evidence to warrant such a conclusion. In the limber-neck outbreak *Cl. botulinum* was isolated with ease from portions of the farm, a thing that has not been previously accomplished by other investigators in several sections of the state. Home canning, especially by such unscientific methods as the so-called cold-pack method has been quite satisfactory up to the last few years. Now, however, with spore-forming anaerobes present in the soil, in dust and on vegetables, such method of canning is far from satisfactory and will result in more outbreaks of botulism if continued. Home canning should be done only by the pressure cooker, or better still, home canning should not be done at all. Only by preventing contamination can we hope to eliminate botulism, and such elimination can best be accomplished by giving physicians of the Northwest the information contained in this article.

Student Health Service and Medical Practice*

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ONE of our senior students came into the office the other day to ask some questions about tuberculosis. He left the office with some elementary knowledge of the disease and also with a tuberculin test. When the test proved positive, he had chest X-ray studies which showed a healed primary infection. During these interviews he was prompted to tell the story of his younger brother. This boy had been employed in a small bank where he had worked hard to advance himself in order to relieve the financial burden of his parents. A year ago he had begun to notice some loss of weight and fatigue. His brother in college had advised him to see a doctor but the boy had hesitated because he was not acquainted with a doctor, worried considerably about the expense involved and the possibility of worrying his parents. His superior in the bank had suggested a vacation during which the boy had a pulmonary hemorrhage. X-rays of the chest revealed advanced tuberculosis with cavitation. His disease should have been discovered earlier, would have been so discovered if the boy had felt that medical care was necessary when he began to lose weight. He might have sought medical care if the expense had not been such an important obstacle. If he had been a student in a college with student health service or employed in an industry with health service, his condition would probably have come to medical attention early enough to reduce materially his period of disability.

The purposes of health service and private medical practice are essentially the same, namely the alleviation of suffering and the reduction of avoidable deaths. Their approaches to the solution of these problems are somewhat different. Private medical practice is concerned primarily with the medical service to the sick individual while student health service is interested primarily in the medical problems of a selected group. Private medical practice has developed as a service to the sick patient while student health service has developed as an agency for the prevention and early care of disability in a given group. Health service is filling so successfully that gap which has existed between the individual who needs medical care and the doctor who is ready to give such care, that it seems worth while to review its development and to point out its importance in medical practice.

Health service in the United States came into being when the United States Public Health Service set up a program of medical care for sailors of foreign ships who became ill in American ports. This was one of the earliest examples of medical practice for a selected group. Health service was introduced into American schools and colleges as a means of reducing absence from class attendance. Physicians entered the schools primarily to aid the Average Daily Attendance by combatting the spread of communicable disease. College student health service got its start when colleges came to depend upon physicians to keep students in their study seats. Dr. Reinhardt, the first university physician at the University of California describes the original purposes of health service there very clearly, "It may be a surprising statement that the University of California infirmary . . . owes its existence less to a direct effort to improve student health than an effort to improve class attendance. . . . When in 1900 the faculty became dissatisfied with the average attendance of students at classes, and investigated the cause of absence . . . the discovery was an unexpected one, that sickness and not idleness or lack of interest was at the bottom of the trouble."

Student health service was originally designed to reduce disability caused by physical defects, poor health habits, injury and illness in the student group. But there has been a growing tendency for student health service to become involved in medical practice for the individual student and this change may be leading to a decreasing emphasis upon the broader purposes of health service as originally conceived.

It should be remembered that student health service is only one unit in the broader program dealing with college health problems. The solution of problems of college health in general served as the impelling motive in the formation of the American Student Health Association. We are aware that health service is only one of the five activities of the college health program. These deal with the following general problems:

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1. Detection and care of student defects, injuries and illnesses (Committee on Health Service).
2. Improving the students' health information (Committee on Informational Hygiene).
3. Safeguarding physical education activities and athletics (Committee on Hygiene of Physical Education Activities).
4. Safeguarding the college environment (Committee on Administrative Hygiene).
5. Meeting specific health problems of students (Committees on: Health Problems of College Women, Mental Health, Eye Health, Tuberculosis, etc.)

In many colleges these various activities of the health program have grown up independently with little relation to the others and with little attempt to integrate the whole program. We often find that student health service is isolated to an extent that the college physician is contributing little to health education or to physical education. In many colleges, student health work has developed an elaborate program dealing with the medical problems of the individual students and with only a meager relationship to the broader aspects of the college health program. This growing emphasis on medical practice within the college has certainly improved facilities for medical care of individual students which may be essential to the satisfactory progress of the broader program. It seems worth while to explore some of the reasons for the development of medical practice in the college and to evaluate results in terms of its relation to the whole college health program on one hand and private medical practice on the other.

Most colleges have found it *necessary* to provide varying amounts of medical care for individual students. Medical practice in the college neighborhood may not have been adequate to meet the needs of student illness or the community medical profession may not have understood or been interested in the rather special problems of student health. Some colleges have had to set up infirmaries because no facilities for the bed care of minor illnesses were available nearby. It should be remembered that the majority of students are not living at home and the dormitory or rooming house is a poor substitute for the home when illness occurs. The majority of these illnesses could be cared for at home. But if homelike care at modest cost is not available in the community then the college has had to provide for it through its student health service and infirmary.

Medical care of the individual student within the college has also developed because college physicians have been anxious to help students correct or adjust to physical handicaps and bring about early attention to incipient disease. Experience has showed that students with such conditions could receive more satisfactory medical supervision by a college physician than by a doctor in private medical practice outside the college.

The college physician has learned that students need early help when illness occurs. The student is able to make the majority of decisions necessary to his progress but he is not a completely mature individual and particularly needs mature guidance in matters of illness. Those of us who have had experience in dealing with these problems are familiar with the tendency of many students to delay seeking medical help when they are sick. Most of them make no preparation for illness when they are well and are at a complete loss to know what to do when they get sick. They will usually call upon the college physician who is easily accessible earlier than they would call a strange doctor in private practice. If the college does not provide health service then the students may undertake their own treatment in order to save expenses or they may accept the advice of their landladies or roommates. Such advice oftentimes is unsound, so that by the time medical attention arrives the disease may be well along and an extended disability may result. If one function of student health service is to keep students at their work, then every possible effort should be made to provide facilities to give them early medical help in the event of illness.

As student health service developed we began to learn that in addition to prompt medical care for illness, students also needed professional advice in answer to their inquiries about personal health and on general medical matters. In these days people have usually heard or read something about their symptoms and tend to use this often meager store of information as a guide in accepting or rejecting medical advice. Unfortunately unsound information is often more impressive and dramatic than sound information and so the former is more readily accepted. The health virtue of foods, cosmetics and drugs has been exploited by advertisers and the unusual and startling diseases and their cures have sometimes been presented to the public before they have been proven in clinics and research laboratories. It is the duty of the medical profession to counteract this misinformation by taking more time to discuss matters medical with their patients.

Certain it is that young people in college are making many inquiries about their personal health and about medical problems as applied to society. It is desirable that these questions be answered by professionally qualified people. The student would often hesitate to discuss such problems with a physician in private practice but feels free to call upon the college doctor. This medical advisory service is one of the most important functions of student health work. I am amazed in reviewing student calls of a day to note the kaleidoscopic variety of medical inquiries and answers that have crossed my desk. They frequently arise at the time of treatment for some ambulatory ailment or come out as a result of confidence established during the care of a more serious illness. There is a never ending variety of subjects which include questions on nutrition, vitamins, diet and diet fads, premarital and sex problems, questions on the selection of a physician, specialist or dentist, and medico-economic problems. It is satisfying to know that students are interested in such problems, that they have felt free to bring their inquiries to the Health Service and that we have been able to supply them with information so essential to their future welfare. It is a service highly de-

served by our patients yet often not given in a busy private practice.

College health service, perhaps unwittingly, has set up a new economic basis for medical care which has materially reduced the cost of student illness and which promises to point the way toward decreasing the costs of community medical care. In the early days of medical practice, diagnostic refinements were few and therapeutic measures were relatively simple. The doctor's laboratory and pharmacy were carried in his bag. But there have been vast improvements in both diagnostic aids and in therapeutic techniques and while these advances have decreased the amount of illness and death, they have also increased the cost of medical care. The medical profession has not been at fault for these changes since the modern physician is obliged to use every available diagnostic aid and therapeutic measure regardless of the expense involved. Neither are the hospitals to blame for the high cost of hospital care. The investment in building and the costs of upkeep must be large if the modern hospital is to supply the complex services that modern practice demands. As these refinements in medical and hospital care have added to life expectancy, so have they also added to the financial burden of being ill. Long sickness is now almost a catastrophe to the average American family and society is looking for a remedy.

College health services early recognized the financial hardships that illness brought to students. The unexpected and unprepared for illness frequently ruined plans for college education. In order to avert these tragedies many colleges and universities have set aside funds, often derived from student assessments, to help reduce this burden of illness. In so doing, the colleges have found an unusually satisfactory means of providing medical care at low costs and have contributed much to the modern health insurance movement.

To be sure, the health insurance plan for college students has succeeded because fees were compulsory, because the plan operates for a homogeneous group living in a partially controlled environment and under conditions that are subject to every possible means of illness prevention. It must be admitted that the student group is for the most part at a vigorous age period and not subject to the degenerative changes of later life, that they form a highly selected and intelligent cross section of society.

The health examination required for admission adds much to this selection and the accessibility of medical care tends to shorten the disability period by way of early diagnosis and prompt treatment. The operation of the out-patient offices is less costly than the office costs of the private practitioner and the overhead and operating costs of equipment are lower because there are fewer idle hours in the day. The operation of the student infirmary or rest home is less costly than that of the modern hospital. The success of this form of health insurance as conducted in our student health service has been well proved and is pointing toward the feasibility and success of similar group plans of medical practice for other units of population.

College physicians have come to assume increasing responsibilities for medical care of individual students because they have found opportunities to give students a type of medical service not always available for their particular needs in private practice. The care of student illness presents certain special problems arising from the fact that many of these young people are separated from their parents and family physicians when illness occurs and are particularly dependent upon having easily accessible medical help. By assuming care for these illnesses, student health service is fulfilling a need to both parent and family physician. Furthermore the college physician is in a unique position to improve the store of health information for a group, many of whom are to become leaders in community thought. Finally, student health service has been able to provide medical service which is often more economical and complete than is possible in private medical practice. Although we recognize that medical care of the individual through student health service is proving very satisfactory, it seems desirable in closing to point out two factors which should govern the development of medical practice within the college. We should remember that the primary obligation of student health service is toward the health protection of students as a group which is only one part of the whole college health program and that the extent to which we undertake medical practice for the individual student should depend first upon the ability of the college to employ competent medical and nursing service and second upon facilities within the college for diagnosis and treatment that are at least the equal of those available in the community.

A Message from the Dead*

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As Mark Anthony said to the citizens of Rome, "I come to show you sweet Caesar's wounds, poor poor dumb mouths, and bid them speak for me," so I have come to bid a thousand dead men speak through their poor "dumb tubercles and ulcers" to the students of America and their guardians represented here in the Student Health Conference.

First in importance in this "Message from the Dead" is the length of time that these tubercles sound their warning before they become inarticulate. The wall of a tubercle is for a long time like the equator—"an imaginary line" rather than a "water-tight compartment." It forms slowly and only after a year's time is there a tough fibrous wall. Even with a collapse of the surrounding lung the fibrous tissue is still slowly formed. It does not reach its full development—even in full retrogression—until seven or eight years.

People who have tubercles that are recently formed, therefore, must be careful to do nothing to interfere with the slowly forming capsule until it is well matured after one, two, or even three years. Even if the lesions do not spread it is comparable to carrying dynamite in paper bags. From my own studies, as well as those of others, I believe it can be stated with considerable certainty, that a large percentage, even a majority, of cases of tuberculosis develop as a result of interference of some sort with the formation of the capsule during the early weeks of the development of the tubercle.

If care is not used, and sometimes with care, a great number of these tubercles are broken, in the "soft shell" stage, and overflow into the surrounding tissues. Many people with a poor defense are never able to check the overflow. It "rolls" on until the tubercles rupture directly into a bronchus either out in the parenchyma of the lung or from the lymph nodes along the bronchi. In such ruptures there is usually a rather acute exacerbation of the disease that is spread by the bronchi. At other times the infection may follow down the peribronchial lymphatics and enter the "lesser" blood circulation as a localized seeding in the lungs. Not infrequently, it even may penetrate one of the pulmonary veins which are, next to bronchi, the least resistant of the major routes of infection. From the veins the bacilli are carried over the body as a generalized seeding. Some foci may locate in distant organs to produce extrapulmonary tuberculosis. If the bacilli are numerous they may overwhelm the body as the classical generalized miliary disease.

This leads to the climax of this discussion, the dormant phase of tuberculous infection. I have spoken of this elsewhere as the "submarine phase" of the disease. Just as measles or typhoid fever have several days when they are not noticed by the patient, called the prodromal period, *so tuberculosis has a silent period that is different from the more acute diseases in that it may last from a few weeks to many years, or even a life time.* Symptoms may appear and disappear. There is little relation between the patient's feelings and these "submarine phases" of the disease. Although there are exceptions to all rules, this latent period ranges from fifteen to eighteen years, when the patient is infected in infancy, down to two or three years, when first infected in adult life. For this reason nobody can tell whether he is free from an infection except after a painstaking search.

These days of "silent disease" (including cases that heal entirely) and the latent phases of cases that become clinically active, outnumber the days of active disease many fold. Relatively few infected people come to the brink of disease, and when they do it is usually, as Krause has so well stated, because of some episode of an accidental nature. These accidents, of a wide variety, must be guarded against in successful disease prevention, and as has been said before, this is of greatest importance during the early weeks of infection.

Another important message that especially concerns the student is that from one-third to one-half of people are infected for the first time after the college age, and as stated previously, when the disease spreads from these first infections it is prone to develop more quickly than in children. This warning is given because there are an *increasing number* of people who are being infected for the first time in the college age or later. All statistics seem to point to a decreasing infection rate, so that more and more people reach adult life without having been infected.

The location of first infections in childhood has been found to occur anywhere in the lungs but with a slight preference for the bases. The location of early lesions in adults, however, is different. In adults the majority (70 to 80 per cent) begin in the upper parts of the lungs, and 90 to 95 per cent begin in the posterior half. This means that over half begin in the posterior upper quarter. In fact, in a former study we demonstrated that 46 per cent fall on the subapical bronchial rami alone. Just how and why the infection begins in these places is not definitely known, but there are several theories, among which is the one concerning relative immobility of the upper parts of the lungs compared to the lower. *The lesions of tuberculosis seem to begin in inverse proportion to mobility of the lung, and after they have begun they progress in direct proportion to lung mobility.* In other words, more lesions are deposited in the inactive bronchi, but when spreading begins they advance more rapidly when situated in the part of the lung that is most inactive. As a result of these physiological principles, lesions in the apex are slower of progress than those in the subapical

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†From the Research Laboratories of the City of Chicago Municipal Tuberculosis Sanitarium.

region. This has led many to consider such lesions benign. Kaiser-Peterson has stated that only 7 per cent become serious. I believe, however, that this figure is too low and that should the patients be followed for long intervals that lesions in the apex would be found more serious than represented by present-day opinion. For the same reasons, perhaps, the basal lesions are always of grave significance.

A question has been raised about this theory to the effect that if immobility causes rest and cure, as in pneumothorax, why then do these lesions cause disease? The answer is simple. Rest does not stop every lesion. The lesions that cause disease "overflow their banks" and spread. It may be within a few months or it may be years. Besides the immobility is only relative.

An important feature of adult infection is that the line between primary and reinfection is all but effaced so far as an antemortem diagnosis is concerned. They are frequently so closely associated that they are distinguished before death only with difficulty. The character of the lesions in the young adult which includes the student is usually a small focus of inflammation, at first invisible, then appearing in the X-ray as a faint fleck or cloud in the upper third of the chest. Larger infiltrates may develop from these as a result of bronchial spread, and later rupture into bronchi. This rupture is frequently the signal for the beginning of active disease. All such lesions, however, do not cause clinical disease.

According to Brauening about one-third of people heal their disease spontaneously. A smaller percentage reach an equilibrium with the disease and carry it through life "scattering seeds of unkindness" along the way. Such cases are some of the main sources of infection today. Any chronic "asthmatic" or person with a "chronic cough" or "bronchitis" should be held in suspicion until a competent physician gives assurance of their safety.

After presenting this quaint message, a logical question is: How are students going to know how to escape tuberculous disease? All this regiment of dead that has been resurrected for the moment were alive and full of hope once, as every other youth. They surely did not wish their sad fate, then how may it be ended? Fortunately, there are available several methods by which this may be accomplished.

The first "city of refuge"—to use a biblical expression, is the tuberculin reaction. This will tell if an infection has ever been present. Contrary to some recent unfavorable reports, the tuberculin reaction is in the front rank of the useful biological tests. As poignantly shown by Myers recently, it is comparable in usefulness to the Wassermann reaction for syphilis. There was a time when it was thought to be useful only for children, but that day has passed. No college student should be without the protection of this valuable indication of infection. If it is negative in all dilutions, there is strong probability that the person has never even been infected by the tubercle bacilli. Such information is of the greatest value, but it carries with it a further obligation. It must be repeated frequently, preferably every year, because the infection may, and usually does, occur unnoticed. If the individual knows that a first infection has occurred because of this reaction, he can then be better able to guard against an exacerbation or reinfection.

Then comes the next step in prophylaxis, viz.: the use of X-ray. A good film should be taken especially of the apical and sub-apical regions of every tuberculin-positive case, and every little fleck or cloud should be watched carefully, for tuberculosis may be compared to a forest fire—small at the beginning but a flaming furnace when it gets under way. The fluoroscope may be used to advantage also, but it is only about 80 per cent as efficient as a good X-ray. It is, however, infinitely better than physical examination.

Finally, what is to be done if a little "fire" is seen in the edge of the "forest", or even if it is only a little smoke?

Everyone has heard about rest treatment. One of the fundamental principles of medicine is to rest an active disease process. Tuberculosis is an "active disease process" par excellence, and responds to rest treatment. In fact, no other treatment should be applied without also using a full rest program. The rest when instituted, however, must be supervised by an experienced physician, because there is a time when it must be relaxed and the patient put back on the highway to complete recovery. The ultimate aim is to restore him to full usefulness.

In more advanced lesions (and it is good insurance for all active lesions) it is advisable to collapse the lung with gas and carry out the rest principle locally to the organ involved as well as to the whole body. During this rest period a full wholesome diet must be given including a full quota of vitamins for there is more to diet today than minerals, proteins and carbohydrates. The latter are necessary, but the patient also needs the accessory substances known as vitamins, ranging now almost from A to P, and including many numerical subdivisions.

Last of all, I would leave for convalescing patients one eternal precept, borrowed from the ancient Greeks, which may be expressed in one word: "moderation". Paul, the Apostle, also preached in his gospel "moderation in all things," which is good *public health* gospel. This should apply to all people whether ill or well, but especially to people infected and afflicted with tuberculosis where a little drinking bout or a period of overwork or even overplay may result in disaster.

For most of the lessons brought out here, and many more, we owe a debt of gratitude to victims who have been cut down before their time. In particular, should we be grateful to the 1211 dead in our institutions who have left "rosetta stones" which I have attempted to translate into your language.

These inscriptions may be compared to a last will and testament that has been probated for the benefit of surviving and unborn humanity, not the least of whom are students of American Colleges.

Seventieth Anniversary Congratulations

59TH ANNUAL SESSION
WATERTOWN 1940

President, J. C. Shirley, Huron
President Elect, O. J. Mabee, Onida
Vice President, S. M. Hart, Onida
Secretary-Treasurer, C. E. Sherwood, Madison
Delegate, A. M. A., J. R. Westaby, Madison
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OFFICE OF
PRESIDENT
J. C. SHIRLEY

SOUTH DAKOTA STATE MEDICAL ASSOCIATION
LUX ET VITA
1862

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HURON, SOUTH DAKOTA

January 12, 1940

The Journal Lancet
84 South Tenth Street
Minneapolis, Minnesota

Gentlemen:

The Management of the Journal Lancet is to be commended on this occasion of its 70th Anniversary. The magazine has assumed a responsibility that it has very satisfactorily performed in these middle western states for a good many years. It has advanced with the development and progress of general medicine and at the present time is a very well balanced magazine.

The scientific articles are well selected and arranged, the editorial section always has something of interest, the news items are a source of information that is desirable, and the advertisements are dependable. Taken altogether, the official magazine of our state organization sets an example that we may well be proud of. You are to be congratulated on the accomplishments and the professional standing that you have maintained over a long period of time.

With the very best wishes for the future, I am,

Yours very truly,

J. C. Shirley

J. C. Shirley, M. D.
President

JCS:DM

AMERICAN STUDENT HEALTH ASSOCIATION

January 17, 1940

Dr. J. A. Myers
Chairman, Board of Editors
The Journal-Lancet
507 Essex Building
Minneapolis, Minnesota

Dear Dr. Myers:

As President of the American Student Health Association, I wish to extend the congratulations of that organization to the Journal-Lancet on the celebration of its seventieth birthday on February first.

The officers and Executive Council of the American Student Health Association are happy to have this opportunity to express the appreciation of our Association for the friendly and cooperative service which the Journal-Lancet has given to us.

Sincerely yours,

Ruth E. Boynton

Ruth E. Boynton, M.D.
President, American Student
Health Association

REB/A

RAMSEY COUNTY MEDICAL SOCIETY
INCIDERE INSPICERE INSCRIBERE
MDCCCLXX

15th FLOOR
LOWRY MEDICAL ARTS BUILDING
SAINT PAUL

January 24, 1940

Dr. J. A. Myers, Chairman
Board of Editors
The Journal-Lancet
84 South Tenth St.
Minneapolis, Minnesota

Dear Doctor Myers:

It is with pleasure that the Ramsey County Medical Society hails the 70th anniversary of the Journal-Lancet. The Ramsey County Medical Society was ten years old when the Journal-Lancet was born, and since that time we have enjoyed a most friendly and beneficial relation with this magazine; therefore we congratulate the Journal-Lancet on their 70th birthday, and wish them many more years of successful endeavor.

Yours very truly,

George N. Ruhberg

George N. Ruhberg, M. D.
President

GNR/eb

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DR H. A. BRANDES, BISMARCK
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North Dakota State Medical Association

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DR A R SORENSON MINOT
TREASURER
DR W W WOOD JAMESTOWN

January 13, 1940

The Journal-Lancet
84 South Eleventh Street
Minneapolis, Minnesota

Gentlemen:

The officers and the members of the North Dakota State Medical Association join me in extending congratulations to the Journal-Lancet on its seventieth anniversary. To have served continuously the medical profession and contributed to the advancement of medicine since 1870 is truly a remarkable achievement.

Our society, fifty-three years old, finds pleasure on this occasion to salute a fellow pioneer, and it is our sincere wish that the future will give you greater opportunities for service.

Sincerely,

N. DAK. STATE MEDICAL ASSOCIATION

H. A. Brandes

H. A. Brandes, M.D.
President

HAB:LP

UNIVERSITY OF MINNESOTA
THE MEDICAL SCHOOL
OFFICE OF THE DEAN

To the Board of Editors and Publishers
of the Journal-Lancet

Gentlemen:

It is a pleasure for me to convey the good wishes and congratulations of the University of Minnesota Medical School to the Journal-Lancet upon its record of service to medicine and to the community over a period of seventy successful years. The Northwest is proud of the contribution which the Journal-Lancet has made in assisting the medical profession in maintaining a front-rank position in the quality of its work. I am sure that the members of the Medical School faculty concur in the confident hope that the Journal may continue to occupy the important position it has had in the past, and that its usefulness may increase with the coming years.

Very sincerely yours,

Harold S. Diehl

Harold S. Diehl
Dean of the Medical Sciences

January 23, 1940

THE AMERICAN COLLEGE OF PHYSICIANS

OFFICIAL JOURNAL—ANNALS OF INTERNAL MEDICINE

January 11, 1940.

To The Journal-Lancet:

The internist, perhaps more than any other type of doctor, is dependent on medical publications, both books and journals; and it seems peculiarly appropriate, therefore, that the American College of Physicians should offer, through its President, expressions of congratulation to a publication which has maintained continuous publication for seventy years.

O. H. Perry Pepper

O. H. Perry Pepper
President

HENNEPIN COUNTY MEDICAL SOCIETY

9000 Medical Arts Bldg
MINNEAPOLIS, MINNESOTA

Lewis M. Daniel, M.D.
Secretary Treasurer

January 11, 1940

The Journal-Lancet
84 South 10th Street
Minneapolis, Minnesota

To the Publishers and Board of Editors:

It gives me great pleasure to offer congratulations to the publishers and Board of Editors of the Journal-Lancet on its 70th anniversary. I am sure that many in our profession will be surprised to know that this publication is now 70 years old. This is a long period to have served the medical profession of the Northwest. During those years there have been articles of great importance by men of international fame.

More than that, however, the Journal-Lancet has been the medium of exchange of medical knowledge over the Northwest territory and in this way has exerted a great influence on the medical profession. I sincerely hope that it will continue in the future as it has in the past to render such service.

Sincerely yours

James A. Johnson, M. D.
President

jaj/lwh

AMERICAN COLLEGE OF CHEST PHYSICIANS

OFFICE OF THE PRESIDENT
RALPH C. MATSON M.D.
1004 STEVENS BUILDING
PORTLAND OREGON

1940

January Fifteenth

J. A. Myers, M.D.
Chairman, Board of Editors
The Journal-Lancet
Minneapolis, Minnesota

Dear Dr. Myers:

As President of the American College of Chest Physicians I am highly pleased to offer my congratulations to the Editorial Board of the Journal-Lancet on the occasion of its 70th anniversary. Seven decades as an active voice and instructive messenger for the profession is an admirable attainment for any publication, this one being the oldest of its kind west of the Mississippi.

Not only the medical profession but every profession requires the stimulus of an official communication whereby its interests may be maintained and advanced. One scarcely need cite the value of a medical periodical to every practicing physician. Some of the most notable contributions in the country have appeared on the pages of the Journal-Lancet, so that too much cannot be said of its illimitably fine influence in its field, especially in the states in which it represents their official magazine, namely, Minnesota, Montana and North and South Dakota.

Very sincerely yours

Ralph C. Matson

President

M:K

MINNEAPOLIS SURGICAL SOCIETY 1922

Jan. 9, 1940

The Journal-Lancet
94 South Tenth Street
Minneapolis, Minn.

Dear Sirs:

Three score years and ten is a span of time that an individual reputedly should be satisfied to live. However, many improvements have evolved since that number of years was given out as a normal existence so that at present the Journal-Lancet having now maintained continuous publication for seventy years is stronger and more virile than ever. The Minneapolis Surgical Society congratulates the Journal-Lancet on this memorable occasion and extends its heartiest felicitations for a long and useful life having now completed its period of development.

With kindest regards I remain

Sincerely yours

Willard D. White

Willard D. White, M.D.
President of the Minneapolis
Surgical Society

WDW:JC

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MINNESOTA STATE MEDICAL ASSOCIATION

493 LOWRY MEDICAL ARTS BUILDING • SAINT PAUL, MINNESOTA

OFFICE OF THE PRESIDENT
B. S. ADAMS, M. D., HIBBING, MINN.

January 15, 1940

The Journal-Lancet
507 Essex Building
Minneapolis, Minnasota

Dear Sirs:

Permit me to offer my congratulations to the JOURNAL-LANCET on achieving its 70th year of distinguished service to medicine in the Northwest.

This long period of continuous publication has provided a vehicle for expression of medical opinion which covers the period of greatest development of medicine in the United States. Its pages have faithfully reflected this extraordinary progress, so much of which is due to individual work of physicians of Minnesota and the Northwest states.

The February issue devoted to pneumonia fittingly marks this unusual editorial anniversary and it is particularly fitting that Dr. Reimann, outstanding authority on pneumonia, and also a former member of the staff of the University of Minnesota Medical School should edit the anniversary issue.

Very truly yours,

Bertram S. Adams

Bertram S. Adams, M.D.
President, Minnesota State
Medical Association

MONTANA STATE MEDICAL ASSOCIATION

January 19, 1940.

Dr. J. A. Myers,
Editor, The Journal Lancet,
84 South Tenth Street,
Minneapolis, Minn.

Dear Dr. Myers:

It is with a great deal of pleasure that I bring to you as editor of the Journal-Lancet, the greetings of the officers and members of the Montana State Medical Association, on the occasion of the seventieth anniversary of the establishment of our official journal. Montana physicians have read and enjoyed the Journal-Lancet for many years even though it has been our official journal for only a few years. During the time that it has been our official journal our relations with you all have been very pleasant. We have been granted much voice as to the policy of the publication, and the Board of Editors have been more than kindly in handling our publications. We do thank you as editor, and wish for you and for the Journal many more years of service to the profession.

Yours very truly,

Harold W. Gregg.

HAROLD W. GREGG, M. D.
President, Montana State Medical Association

GREAT NORTHERN RAILWAY COMPANY

SURGICAL AND MEDICAL DEPARTMENT

January 11, 1940

Dr. J. A. Myers, Chairman Board of Directors
The Journal-Lancet
84 South 10th Street
Minneapolis, Minnesota

Dear Dr. Myers:

Just a short note of congratulations and best wishes to the Journal-Lancet and its very efficient Chairman and Editorial Staff on their 70th anniversary from the Great Northern Railway Surgeons' Association.

We are especially grateful for your December issue in which all of the proceedings of our 1939 meeting, held at Glacier Park, were published in full. No doubt this special number of the Journal-Lancet was ready by every member of the Great Northern Railway Surgeons' Association.

I have personally enjoyed the Journal-Lancet for many years and feel that it has been a great service to the medical profession in the Northwest. May I take this opportunity in behalf of the Great Northern Railway Surgeons' Association to wish you the greatest success in the future.

Very truly yours,

D. S. MacKenzie

D. S. MacKenzie, President
Great Northern Railway Surgeons'

DSM:rk

MINNEAPOLIS CLINICAL CLUB 1920

The Journal-Lancet
84 South Tenth Street
Minneapolis, Minnesota

Gentlemen:

The Minneapolis Clinical Club wishes to offer their congratulations on your seventieth anniversary. It is noteworthy that your publication has served the medical profession of the northwest for these seventy consecutive years. I am sure it has been a vital instrument in the advance of madical progress in this territory.

Yours truly,

James K. Anderson

James K. Anderson, M.D.
President

JKA:LB

The
JOURNAL LANCET

Represents the MINNESOTA, NORTH DAKOTA *Medical Profession of* SOUTH DAKOTA and MONTANA

The Official Journal of the

Minneapolis Clinical Club
American Student Health Ass'n
North Dakota State Medical Ass'n
South Dakota State Medical Ass'n
Montana State Medical Ass'n
Sioux Valley Medical Ass'n
Great Northern Ry. Surgeons' Ass'n

W. A. Jones, M.D., 1859-1931

LANCET PUBLISHING CO., *Publishers*
84 South Tenth Street, Minneapolis, Minn.

W. L. Klein, 1851-1931

Minneapolis, Minn., February, 1940

SPECIAL PNEUMONIA ISSUE

Whenever a new drug is introduced, particularly when the new drug gives spectacular results in certain specific diseases, there is always a danger of exaggerating its value, and employing it in other similar conditions in which it is ineffective. This is especially true in the case of sulfapyridine which is so valuable in the treatment of pneumococcus pneumonia. The matter here is peculiarly complicated since specific immune serum therapy has within recent years been brought to a degree of efficiency and simplicity which has resulted in its general acceptance by practicing physicians. It is therefore a matter of great practical importance to know whether chemotherapy or serotherapy is the more valuable, whether one should be used to the exclusion of the other, or if they should be used in combination. At the time of writing, enough data have not as yet been collected to determine these points. Regardless of the present uncertainty it is, and perhaps always will be, necessary to determine the cause of the pneumonia in each instance since there are many kinds of the disease for which neither specific serotherapy or chemotherapy have been developed. In such cases it is of importance not to subject the patient to the discomfort, expense and danger of needless treatment. It is also of importance to know the cause in order to apply proper prophylactic methods to prevent the disease, whatever its cause, in others.

The papers on pneumonia presented in this issue have been written to encompass the fields in which most progress has been made in regard to acute infections of the lung. In the first paper, diagnosis has been stressed in an attempt to point out that pneumonia itself is composed of many different infections each caused by a different agent and each requiring different measures for prevention and treatment. Many of these entities, to be sure, are rarely seen in general practice, but their existence nevertheless must be recognized.

The second, third and fourth papers dealing respectively with pathogenesis and pathology, treatment, and prevention refer chiefly to pneumococcus pneumonia, a common disease, for which specific serotherapy and chemotherapy are available. The subject of the pre-

vention of pneumonia is perhaps the most important of all since here, as in most other cases, the old adage pertaining to the relative value of prevention and cure is particularly apt.

H. A. R.

THE COMING CONQUEST OF PNEUMONIA

A writer on popular medical subjects has sought to touch a responsive chord by playing on the theme that the medical profession is slow to accept new ideas and methods of treatment. Certain lay magazines in their so-called medical departments have pitched their pipes to the tune. No propaganda rings more falsely. With techniques and objective methods by which the truth or falsity of claims may be determined and with adequate controls for comparison, medicine moves in the van in a world almost dizzy from its rate of advancement. In the New World, medicine, still free from governmental rigors, continues to move forward while governments in the Old World struggle along the backward path.

The current number of the Journal-Lancet presents another editorially planned number on a timely subject. Mortality from pneumonia is in the way of being conquered, and this disease is joining that long list of conditions in which the value of medical science to mankind is being demonstrated.

Loosli, Sutliff, Finland and Reimann treat the subject from different points of view. They have been brought together for our readers by the last mentioned author. Reimann's years of activity as Associate Professor of Medicine in the University of Minnesota make him a familiar figure in this region. His writings from his present post in Philadelphia bring him back to us with an authority recognized in this field.

Careful study of these papers will be well rewarded. Foremost is the emphasis on etiology, as compared with the older emphasis on pathology and distribution of the processes in the lung. Attention is called to the value of the history in relating inflammations in the lung to such infectious diseases as typhoid fever, tularemia, influenza, psittacosis, rheumatic fever and others, as well as to oil aspiration, irradiation, chemical substances and allergic states. The importance of hemolytic streptococci, staphylococci, Pfeiffer's bacilli, and B. Friedlander, as causative agents in some cases is stressed. The advantages of speed and accuracy in typing of pneumococci and the relative importance of the more common, as distinguished from the rarer, higher numbered types receives needed emphasis.

Warning is given that not all pneumococci found in sputum are causative of the pneumonia, and that continued study of type may be necessary as the case progresses.

We see by the study given to specific therapy that no single mode is applicable to all cases, and that the use of serum, chemotherapy, or a combination of both in certain situations should have careful consideration.

Because of limitations of space and the subjects assigned, this group of writers has not emphasized the need in chemotherapy for determination of sulfapyridine levels; for instance, in the blood serum of patients under treatment. This need goes without saying. Finland, *(sic)* following his discussion of the limitations and toxicity of sulfapyridine, touches the question of the effective levels of this drug in the serum, and calls attention to its irregular absorption, excretion and acetylation.

In any laboratory equipped with a colorimeter, methods are available for the quick and easy determination. To give "a little sulfapyridine" or to use it without knowledge of its concentration in the circulating blood is not good therapy, and is not defensible in our present state of knowledge. In Sutliff's article is a statement as to the amounts of antipneumococcic serum most effective.

Our progress in the specific treatment of pneumonia is truly in its beginning. Much cheaper serums are on the way. A less toxic drug seems to be nearly ready for general distribution, and further improvements are to be sought. When we find that the mortality figures for pneumonia are already cut to one-half and even one-third, and that the hospital stay may be much shortened, we realize that any expense already entailed is justified, but bringing down the cost to each patient is a real contribution toward lowering the costs of medical care.

Is pneumonia a preventable disease? Some light is already appearing. There may be another contribution to add to those medicine has already made to human welfare.

S. M. W.

SEVENTY YEARS

The perpetuation of the Journal-Lancet for seventy years has depended on generation after generation of physicians and professional publishers, who made numerous sacrifices in order that medical information might be disseminated among the physicians whom they served.

When the magazine destined to become the Journal-Lancet made its appearance, Lister had barely introduced aseptic methods in surgery. There was still a great group of persons who believed in spontaneous generation, as they had not accepted the work of Pasteur, Villemin, and Lister. This medical magazine was in the field as the scene unfolded. Beginning with anthrax, one pathogenic micro-organism after another was isolated. Those in charge of the Journal-Lancet saw antitoxin for diphtheria and tetanus come into existence and later immunizing agents for diphtheria and typhoid fever. They saw intestinal disorders, such as cholera infantum, as a leading cause of death, but later conquered. They saw the discovery of the fact that an intermediary host transmitted a protozoan from animal to animal, causing tick fever in cattle, thus opening the door for the discovery of the cause of malaria and yellow fever. They were present when the first attempts were made to treat many conditions surgically, accompanied by ever-improving methods in anesthesia. They saw the discovery of vitamins and the unfolding of this field, as well as allergic conditions. They saw the X-ray and the bronchoscope make their appearance. They saw the veterinarians attacking diseases of animals transmissible to man, the last of which was encephalomyelitis in horses.

As these and many other developments occurred over

the past seventy years, the JOURNAL-LANCET has conveyed to its readers all available information as fast as it was definitely established. When the JOURNAL-LANCET was founded, the average length of life in this country was approximately forty years; now it is more than sixty. When this magazine was founded, the University of Minnesota was only nineteen years old, and the medical school was not established until twenty years later. The Universities of South Dakota, North Dakota, and Montana, were founded twelve, thirteen, and twenty-five years later, respectively. Student health work was unknown but during the existence of the JOURNAL-LANCET it has been developed so that today there is almost no college or university which does not have a health program for its students and the American Student Health Association is now one of the most potent influences on the present and future health of the people of this nation.

The present issue is a typical example of the work the JOURNAL-LANCET has done throughout its existence. Although the various phases of the development of our knowledge of pneumonia have been presented in the pages of the JOURNAL-LANCET throughout the decades, in this issue the reader is brought to date by Dr. Reimann, whose contributions to our knowledge of this disease have caused his name to be known around the world.

Throughout its history, each group of editors and publishers have tried to make the JOURNAL-LANCET better than they found it. The present group are putting forth their efforts to continue this principle so that at the appropriate time the magazine may be passed on to others, who will continue to perpetuate and improve it in such a way that it will always be of maximum service to its readers who are responsible for the health of their respective communities.

J. A. M.

1930-1940: THE VITAMIN DECADE

What medical historians will label the thirties no one can tell, but there is a good possibility that this period will go down in history as the "vitamin decade." Certainly no previous ten years in the history of mankind has seen such advances in the knowledge of vitamins. Three columns with approximately 100 references covered the field of vitamins in vol. 25 of the *Quarterly Cumulative Index* (Jan.-June, 1929). The corresponding period for 1939 required 26 columns of over 900 titles.

The establishment of the formula and the synthesis of Vitamin A are recent triumphs of chemistry. The eleven vitamins now available in synthetic form were displayed at the national meeting of the American Chemical Society. These are vitamins A, B_1, B_2, B_6, C, D_2, E, K, riboflavin, nicotinic acid and ergosterol.

In the last decade vitamin B has become the Vitamin B complex and the elements of that complex are being defined. The Committee on Vitamin Nomenclature has advised abolishing the term Vitamin B, unqualified; recommending Vitamin B_1 for the anti-polyneuritic factor, riboflavin in place of B_2 or G, and pellagra preventative factor or P-P factor. Nicotinic acid seems to fill the bill for the anti pellagra factor.

Albert Szent-Gyorgi's name will always be associated with the isolation of Vitamin C. For this work he was awarded the Nobel Prize in Medicine and Physiology in 1937, the first such award for vitamin research. The advances in chemical knowledge led to great strides in determining new sources of vitamin C. The therapeutic use of Vitamin C in hemorrhagic and purpuric states is based upon its specific action in the hemorrhages of scurvy. However hemorrhagic diseases of non-scorbutic origin have not responded to the use of ascorbic acid.

Several forms of vitamin D have been distinguished in recent years. The two forms of interest in medicine are activated ergosterol and activated dehydro-cholesterol. The cholesterol form is found in animal skin. Vitamin E is a fat soluble factor whose presence in the diet is necessary for fertility in rats. It seems to have a definite effect in increasing fertility among cows. There is no proof at present that Vitamin E affects fecundity in human beings.

Vitamin K is also a fat soluble principle, of importance in formation of blood clot. Vitamin K seems to be essential for the production of prothrombin. There is evidence to show that hemorrhagic states common in obstructive jaundice can be controlled by the proper administration of Vitamin K.

There is no doubt that large underprivileged groups within the population suffer from vitamin deficiencies. The proper treatment of these people is provision for adequate diets rather than wholesale exhibition of vitamin mixtures. The council on Pharmacy and Chemistry of the American Medical Association does not recognize preparations including a variety of vitamins excepting combinations of A and D. An excellent summary of recent knowledge on vitamins is contained in the symposium on the subject published in book form by the American Medical Association in 1939.

Vitamin research bloomed full flower in the thirties. The exaggerated claims, the fads will wither away. But the wealth of knowledge gained of new sources, new uses, and even of new elements in the vitamin series, should serve mankind for all time to come.

R. B.

STREAM-LINED INTERSECTIONS

The greatest problem confronting highway transportation today is the hazard to life and limb. New safety devices are installed by the manufacturers of motor vehicles from year to year. Speed laws have been enacted and officers provided for enforcement. Road beds have been paved and lanes instituted structurally or painted on the surface. Signs have been erected that indicate by word, picture, number, arrow, color, and electric flash the precautions required. But lo, the carnage still goes on!

In the country, the ratio between intersectional and straight-of-way accidents is 18 to 25 per cent, while in cities the slaughter-at-the-crossroads measures up to 80 per cent, which is an appalling figure. City intersections differ from country intersections in one important particular: high buildings obstruct the motorist's view at the corners, especially in downtown districts. Double-decker

and through-traffic streets have been tried here, but they are suited to certain places and purposes only. The majority of a city's intersections cannot be so treated; and we must find some plan suitable for more universal application. Something must be done—something by far more drastic than anything attempted heretofore.

When we consider all that has transpired in motordom during the past 40 years, it should not take much courage to make a few predictions. To eliminate these intersectional corners in the city, it would only be necessary to change our style of architecture. Something like that is being done right along, and it would not be difficult to visualize a planning commission that would alter old and prescribe new blocks of circular rather than square forms. In the smartest shopping districts, the sidewalks might be moving discs or two discs moving in opposite directions. The shops would be smaller than those which we are accustomed to. No trucking would be permitted in such sections of the city, and alleys would be eliminated. Goods for each circle would arrive underground at a central or hub station from which in turn they would be distributed to the various *boutiques* by a spoke-radiating shuttle system.

As it now is, intersections must serve the east and west plus the north and south traffic without allowing any additional area for this double load. With circular blocks there would be additional space and a clearer view of cross traffic. In the past, we have condemned parts of buildings, in many instances at great expense, in order to widen our avenues. Now let us stream-line our intersectional structures by doing away with the dangerous corners.

A. E. H.

Book Reviews

Synopsis of Pediatrics, by John Zahorsky, A.B., M.D., F.A.C.P., professor of pediatrics and director of department of pediatrics, St. Louis University School of Medicine, assisted by T. S. Zahorsky, M.D.; third edition, 430 pages with index and illustrations; St. Louis: C. V. Mosby Company, 1939.

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The authors have succeeded in the difficult undertaking of condensing modern knowledge of pediatrics into a comparatively small volume. They have selected wisely from the enormous literature on pediatrics that has accumulated during the last quarter of a century.

This highly practical book should be not only of interest to the student of medicine but also of use to the general practitioner. Essential points in symptomatology, diagnosis and treatment of almost every pediatric condition are included. There are no references to the literature, but stress is laid upon the clinical features of the disease.

In brief, the book is valuably comprehensive, concise and clinical. It is amply illustrated, including 144 black-and-white illustrations and nine color plates. A thinner paper and a larger type might have made a book of equal size and greater technical readability.

Principles of Chemistry, by Joseph H. Roe, Ph.D., professor of biochemistry, School of Medicine, George Washington University, Washington, D. C. Fifth edition; 503 pages with illustrations and index. St. Louis: C. V. Mosby Co., 1939.

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Though originally designed as an introductory textbook of inorganic, organic and physiological chemistry for nurses and other students of applied chemistry, the efforts made to stress the significance of chemistry and the interpretation of normal living processes and the emphasis placed on the relation of chemistry to life, make this book a valuable volume for imparting culture. The fifth edition of the book has brought the subject matter up to date and incorporated recent discoveries, such as those concerning the nucleus of the atom.

Discussions involving physiological chemistry have received full treatment and their application to the understanding of disease conditions outlined. Since it organizes in a straightforward fashion some of the latest knowledge on nutrition, vitamins and hormones, it may be of interest to physicians who wish to review this expanding field of knowledge.

For the student, the book has a valuable glossary of chemical terms that have won a regular place in clinical medicine.

Introduction to Physiological and Pathological Chemistry, by L. Earle Arnow, Ph.D., instructor in physiological chemistry, University of Minnesota Medical School. 555 pages with index; illustration. St. Louis: C. V. Mosby Co. 1939.

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This book is written with remarkable clarity. Intended as a textbook for students, it treats of the fundamentals of inorganic, organic, pathological and physiological chemistry with the simplicity of excellence. The author states that the manuscript of the volume was read by two persons completely unfamiliar with chemistry and that anything which did not seem clear to them was changed to make it clear.

The emphasis in this volume has been placed upon physiological chemistry, with a host of examples drawn from topics which are of interest in clinical medicine. Chapters on hormones, vitamins and nutrition are included. Everying is brought strictly up-to-date in this first edition of Dr. Arnow's work. For this reason, even the physician may find it a valuable book for an organized review of topics to which scattered references in periodical medical literature are frequently found.

The book is written with special reference to the needs of hospitals and nursing schools and is an outgrowth of Dr. Arnow's work in teaching student nurses at the University of Minnesota during the past five years. An interesting introductory chapter has been written by Katherine J. Densford, director of the University of Minnesota School of Nursing.

The Year Book of General Medicine, edited by George F. Dick, M.D., J. Burns Amberson, Jr., M.D., George R. Minot, M.D., S.D., F.R.C.P., William B. Castle, M.D., William D. Stroud, M.D., and George B. Eusterman, M.D. 848 pages with index; illustrated; 1939. Chicago: Year Book Publishers, Inc. Price, $3.00.

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The 1939 *Year Book of General Medicine* maintains its high level of selectivity. It contains all 1939 medical topics uppermost in the minds of the practical men in medicine today—sulfapyridine for pneumonias, new indications for sulfanilamide in infectious diseases, the new method of visualizing the liver and spleen, improved management of coronary, leukopenic and hemorrhagic diseases, to mention but a few—are presented in compact detail in this volume. Every word of the text, every illustration is new. For the purpose of the *Year Book* is to bring up-to-date the story of the past year's advances in general practice.

Most noticeable among its special features are three sets of color-plates: (1) those from England giving striking visible evidence of effects of aspirin and other substances on the stomach mucosa; (2) the first color-photographs of the interior of the living stomach ever published—a new development from Henning's clinic in Leipzig, of paramount importance in the teaching and understanding of internal diseases; (3) a special plate prepared under the direction of Drs. Minot and Castle to aid in the diagnosis of polycythemia.

Proceedings of the

Twentieth Annual Meeting

of the

AMERICAN STUDENT HEALTH ASSOCIATION

Hotel New Yorker, New York City

December 28-29, 1939

Business Session

OFFICERS—1940

President—Dr. Ruth E. Boynton
Vice-President—Dr. Fred N. Miller
Secretary-Treasurer—Dr. Ralph I. Canuteson

Council

Dr. R. W. Bradshaw — Dr. D. F. Smiley
Dr. John Sundwall — Dr. E. Lee Shrader
Dr. J. E. Raycroft — Dr. T. A. Storey
Dr. H. S. Diehl — Dr. Ruth M. Collings
Dr. J. F. Edwards — Dr. H. N. Kingsford
Dr. W. E. Forsythe — Dr. Dan G. Stine
Dr. W. H. York — Dr. Joseph Ritenour
Dr. Florence Gilman

Executive Committee

Dr. Ruth E. Boynton — Dr. Ralph I. Canuteson
Dr. Fred N. Miller — Dr. Warren E. Forsythe
Dr. D. F. Smiley

THURSDAY, DECEMBER 28

Morning Session—North Ball Room

9:00—9:30 Registration—North Ball Room Foyer.

9:30—11:00 Call to order by President—Dr. Charles E. Shepard, Stanford University.

Secretary's Report—Dr. Ruth E. Boynton, University of Minnesota.

Reports of Chairmen of Standing Committees (10 minutes each).

Committee on Local Sections—Dr. Dean F. Smiley, Cornell University.

Committee on Eye Health—Dr. R. W. Bradshaw, Oberlin College.

Committee on Tuberculosis—Dr. C. E. Lyght, Carleton College.

Committee on Organization and Administration—Dr. M. W. Husband, Kansas State College of Agriculture and Applied Science.

Committee on Health Service—Dr. R. I. Canuteson, University of Kansas.

Committee on Informational Hygiene—Dr. T. B. Kirkpatrick, Columbia University.

Committee on Hygiene of Physical Education Activities—Mr. W. R. LaPorte, University of Southern California.

Committee on Health Problems of College Women—Dr. Ruth Fairbank, Mount Holyoke College.

Appointment of Nominating Committee.

11:00—12:00 General Session.

A Quarter Century of Student Health at the University of California—Dr. Robert J. Legge, University of California.

Joint Luncheon—12:30 (Terrace Room)

American Student Health Association and The College Physical Education Association.

The Relation of Physical Education to Student Health—Mr. L. J. Boles, President, The College Physical Education Association.

Medical Practice and Student Health—Dr. Charles E. Shepard, President, American Student Health Association.

Afternoon Session

2:30—3:30 Round Table Sessions.

Room 531—Committee on Health Service. *Chairman*, Dr. R. I. Canuteson, University of Kansas. General Topic: Examination Procedures and Record Forms. Discussion Leaders: Dr. A. V. Bock, Dr. H. D. Lees, Dr. Dorothea Scoville, Dr. A. O. DeWeese, Dr. J. Wilbur Armstrong.

Room 533—Committee on Informational Hygiene. *Chairman*: Dr. T. B. Kirkpatrick, Columbia University. General Topic: Reference Materials and Teaching Aids in Hygiene Instruction. Presiding: Dr. C. E. Turner. Discussion Leaders: Dr. K. Frances Scott, Dr. E. F. Van Buskirk, Dr. Anita D. Laton, Miss Louise Strachan.

3:30—5:00 Round Table Sessions.

Room 524—Committee on Organization and Administration. *Chairman*: Dr. M. W. Husband, Kansas State College of Agriculture. General Topic: Student Infirmaries and Student Hospitals. Discussion Leaders: Dr. H. D. Lees, Dr. Irvin W. Sander, Dr. Grace M. Kahrs, Dr. William B. Brown, Dr. H. N. Kingsford.

Room 536—Committee on Health Problems of College Women. *Chairman*: Dr. Ruth Fairbank, Mount Holyoke College. General Topic: Relation of Student Health Service to College Guidance Program. Discussion Leaders: Dr. Ruth Collings, Dean Harriett M. Allyn, Dr. Marjorie Smith.

Parlor D—Committee on Eye Health. *Chairman*: Dr. R. W. Bradshaw, Oberlin College. General Topic: Illumination Standards and Vision Testing Technique. Discussion Leaders: Dr. Lee H. Ferguson, Dr. J. D. Schonwald.

(Abstracts of all discussions will appear in the Proceedings)

6:30 p. m. 1939 Council Dinner (East Room).

FRIDAY, DECEMBER 29

Morning Session—North Ball Room

9:00—12:00 Joint session of The College Physical Education Association and the American Student Health Association. *Co-chairmen*: Mr. W. R. LaPorte, University of Southern California, American Student Health Association; Mr. Glenn Howard, Ohio State University, The College Physical Education Association. Theme: Health Implications, Responsibilities and Problems of the Physical Educator.

9:00—9:20 The Inter-Relationships of School Health and Physical Education—Dr. J. E. Raycroft, Princeton University.

9:20—9:40 The Administration of School Health and Physical Education as an Integrated Unit—Mr. Sheiler N. Lawton, New York University.

9:40—10:00 The Relationships of Physical Educator and Physician—Dr. Dean F. Smiley, Cornell University.

10:00—10:30 Questions and Panel Discussion.

(5-minute recess)

10:35—10:50 The Place of the Physical Education Teacher as a Health Counselor—Dr. T. Bruce Kirkpatrick, Columbia University.

10:50—11:05 The Physical Education Teacher's Responsibility for Health Instruction—Miss Mabel Rugen, University of Michigan.
11:05—11:20 Opportunities for Mental-Emotional Health Guidance in Restricted and Remedial Activities—Mr. George Stafford, University of Illinois.
11:20—12:00 Questions and Panel Discussion.
12:30 Council Luncheon (Parlor C).
12:30 **Tuberculosis Committee Luncheon**
(North Ball Room)
Presiding: Dr. Kendall Emerson, Managing Director, National Tuberculosis Association. Report of Tuberculosis Committee—Dr. Charles E. Lyght, Carleton College, *chairman*. Dividends from a Tuberculosis Control Project Among Students—Dr. J. Burns Amberson, Jr., Columbia University.

Afternoon Session—North Ball Room

2:00—2:30 Business Meeting.
Report of Council Meeting.
Report of Nominating Committee.
Introduction of New President.
2:30—4:30 General Session.
A. Committee on Organization and Administration. *Chairman,* Dr. M. W. Husband, Kansas State College of Agriculture. Floor Plan of a New Health Service Building—Dr. W. E. Forsythe, University of Michigan. Floor Plan of the New Health Service Building on the Agricultural Campus at the University of Minnesota—Dr. Ruth E. Boynton, University of Minnesota.
B. Committee on Informational Hygiene. *Chairman,* Dr. T. B. Kirkpatrick, Columbia University. Contribution of the Physical and Health Education Teacher to the Guidance Program—Dr. Ruth Strang, Teachers College, Columbia University.
C. Committee on Mental Hygiene. *Chairman,* Dr. Theophile Raphael, University of Michigan. Epilepsy Among College Students—Dr. Leonard Himler, University of Michigan.
D. Committee on Health Service. *Chairman,* Dr. R. I. Canuteson, University of Kansas. Contagious Diseases in College Students—Dr. Llewellyn R. Cole, University of Wisconsin.
E. Committee on Eye Health. *Chairman,* Dr. R. W. Bradshaw, Oberlin College. The College Student's Vision, Dr. J. H. Kler, Rutgers University. Discussion opened by Dr. LeGrand H. Hardy, American Academy of Ophthalmology and Otolaryngology.
General discussion.
Adjournment.

BUSINESS MEETING

Thursday, December 28, 1939

Report of the Secretary-Treasurer

The following report of the Executive Council meeting of December 30, 1938, was read and approved:

"The following members of the Council were present: Dr. Charles E. Shepard, Dr. J. P. Ritenour, Dr. Ruth E. Boynton, Dr. R. W. Bradshaw, Dr. J. E. Raycroft, Dr. T. A. Storey, Dr. W. E. Forsythe, Dr. D. F. Smiley, Dr E. Lee Shrader, Dr. Ruby Cunningham, Dr. Glenadine Snow, Dr. W. H. York, Dr. Lee H. Ferguson, Dr. H. N. Kingsford, Dr. Dan G. Stine, Dr. Ruth M. Collings.

"The place of holding the next annual meeting of the Association was discussed by the Council. Dr. Storey felt that it would be well for our Association to meet with the National Collegiate Athletic Association if this is feasible. The possibility of holding the next annual meeting in St. Louis was discussed and the suggestion was favorably received by many members of the Council. It was voted to withhold decision of the next meeting place until the meeting of the N. C. A. A. is known. Letters will then be sent to members of the Council for an expression of opinion.

"Dr. Shepard presented a recommendation of the Committee on Informational Hygiene that the American Student Health Association coöperate with the Metropolitan Life Insurance Company in the preparation of teaching material on health for the college group. After some discussion it was moved by Dr. Ferguson and seconded by Dr. Forsythe that the Association coöperate in this project. Motion was carried.

"Dr. Ferguson and Dr. Forsythe suggested that Dr. Joseph Raycroft be asked to compile historical material pertinent to the development of student health work in this country. Dr. Raycroft expressed his willingness to try to do this. A motion by the Council formally requesting that he do this was unanimously carried.

"The Secretary read a letter from Mr. L. M. Cohen, manager of the JOURNAL-LANCET, expressing the appreciation of the JOURNAL-LANCET for the fine coöperation received from the American Student Health Association, and assuring us of his willingness to assist us in any way they might in making the JOURNAL-LANCET of value to our Association.

"The Council adjourned."

The total membership of the Association is now 164, 161 of which have paid their annual dues. Applications for membership have been received from 17 institutions during the past year. The University of the State of New York, Swarthmore College, and the Physical Education Department of Columbia University have withdrawn from the Association.

Refunds for all institutions in the sections belonging to the American Student Health Association have been sent to local sections during the past year.

RUTH E. BOYNTON, M.D.
Secretary-Treasurer.

FINANCIAL STATEMENT

December, 1939

Receipts

Balance brought forward		$1,807.00
Dues for 1939 from 162 member institutions		1,620.00
Dues for 1938 from 2 institutions (Swarthmore, Bennett)		20.00
Dues for 1937 from 1 institution (Swarthmore)		10.00
Dues for 1940 from 14 institutions		140.00
Proceedings sold: 11 at $1.75		19.25
Refund from Hotel New Yorker		201.50
		$3,817.75

Disbursements

Subscriptions to JOURNAL-LANCET (182)		$273.00
Postage:		
Secretary's office	$27.49	
Dr. Lyght's committee	10.00	
		37.49
Telegrams		6.74
Express (for sending active files to Dr. Canuteson)		1.57
Dr. Smiley's expenses to American Association for Health Physical Education and Recreation meeting		23.10
Secretarial help		50.00
Associate membership in American Council on Education		10.00
Exchange on checks		4.33
Refunds to Sections:		
Mississippi Valley	$12.50	
Pacific Coast	20.00	
Rocky Mountain	17.50	
Southwestern	15.00	
Indiana	10.00	
Ohio	37.50	
Mid-Atlantic	40.00	
Southern	22.50	
New York	40.00	
Pennsylvania-New Jersey	47.50	
North Central	35.00	
Michigan	15.00	
South Central	27.50	
		340.00

Stationery and printing (programs), 1939		29.00	
1938 Proceedings:			
400 copies	$320.00		
500 labels	3.50		
400 boxes	40.00		
Postage	68.83		
		432.33	
Convention expense, 1939:			
Council dinner and luncheon	$ 48.80		
Tips, tax, telephone	29.00		
Rental of projector	12.00		
Guest tickets for luncheon	15.55		
Travel expense, secretary	74.74		
Registration clerk	8.00		
Hotel New Yorker—over-payment	201.50		
		389.61	
			1,597.17
Balance			2,220.58

REPORT OF THE NOMINATING COMMITTEE

The Nominating Committee, consisting of Dr. D. F. Smiley, *chairman*, Dr. E. Lee Shrader, and Dr. Ruth Collings, presented the following ballot for officers of the Association for the year 1940:

President: Dr. Ruth E. Boynton, University of Minnesota, Minneapolis, Minnesota.

Vice-President: Dr. Fred N. Miller, University of Oregon, Eugene, Oregon.

Secretary-Treasurer: Dr. Ralph I. Canuteson, University of Kansas, Lawrence, Kansas.

Members of the Council for two years, terms expiring December, 1942:

Dr. W. H. York, Princeton University, Princeton, New Jersey.

Dr. Florence Gilman, Smith College, Northampton, Massachusetts.

Dr. Joseph Ritenour, Pennsylvania State College, State College, Pennsylvania.

The report of the Nominating Committee was accepted and the secretary instructed to cast an unanimous ballot for these officers.

BUSINESS MEETING
Friday, December 29, 1939

The secretary gave the following report of the meeting of the Executive Council which was held Thursday evening, December 28, 1939.

The following members of the Executive Council were present at this meeting: Drs. Shepard, York, Bradshaw, Kingsford, Storey, Raycroft, Forsythe, Ferguson, Shrader, Collings, Smiley and Boynton.

Applications for membership in the Association were presented for the following institutions, and the Council recommended that membership be granted these institutions:

Brigham Young University, Provo, Utah: Dr. L. Weston Oaks, Mr. D. Elden Beck.

Colorado College, Colorado Springs, Colorado: Dr. Leo W. Bortree.

University of Denver, Denver, Colorado: Dean Gladys C. Bell, Dean R. J. Walters, Dean Clem W. Collins.

DePauw University, Greencastle, Indiana: Dean G. Herbert Smith.

Eastern Kentucky State Teachers College, Richmond, Kentucky: Dr. J. D. Farris.

Fenn College, Cleveland, Ohio: Dr. Harry D. Morris, Dr. Hyman Lumer, Mr. Homer Woodling.

Jefferson Medical College, Philadelphia, Pennsylvania: Dr. H. R. Hamrick.

Kansas State Teachers College, Pittsburgh, Kansas: Dr. J. Ralph Wells, Dr. O. P. Dellinger.

Keuka College, Keuka Park, New York: Dr. Barbara Strait.

Mills College, Oakland, California: Dr. Rosalind Cassidy.

Milwaukee State Teachers College, Milwaukee, Wisconsin: Dr. Benjamin Lieberman.

New Jersey College for Women, Rutgers College, New Brunswick, New Jersey: Dr. Ruth Stephenson.

Northern Illinois State Teachers College, DeKalb, Illinois: Dr. I. C. Benesh.

Randolph-Macon College, Lynchburg, Virginia.

State Teachers College, Farmville, Virginia: Dr. Jean M. Martin.

Washington and Lee University, Lexington, Virginia: Dr. Reid White, Jr.

Wyoming, University of, Laramie, Wyoming: Dr. L. L. Sanford.

Yeshiva College, New York City: Dr. David A. Swick.

The withdrawal from the Association of the Physical Education Department of Columbia University and the University of the State of New York were accepted by the Council. The secretary reported that Swarthmore College had also asked to withdraw from the Association. It was the opinion of members of the Council who are familiar with Swarthmore that an effort should be made to induce Swarthmore to continue membership in the Association. It was suggested by Dr. Raycroft that Dean Mercer, of the University of Pennsylvania, who formerly was at Swarthmore, be asked to make an attempt to have Swarthmore reconsider withdrawing from our Association.

The secretary reported that the following three institutions had not paid their dues for the year 1939:

University of Houston, Houston, Texas.

Nazareth College, Nazareth, Michigan.

Central State Teachers College, Mount Pleasant, Michigan.

Dr. Smiley presented a report to the Council on the activities of the sectional groups. Several of the schools in the Northwest Section have expressed a desire to continue membership in the Pacific Coast Section. Since all of the colleges belonging to the national Association in this Northwest Section wish to join with the Pacific Coast group, it was moved by Dr. Smiley and seconded by Dr. Storey to withdraw authorization for the Northwest Conference on High School and College Hygiene as a section of the American Student Health Association until such a time as there seems evidence of a need for a Northwest Section, and that the States of Washington, Oregon, and Idaho be returned to the Pacific Coast Section. This motion was passed unanimously.

Dr. Smiley reported that the New England Section had been inactive for a number of years. The President of this Section has retired from active student health work, and the Secretary of the Section feels unable to assume the responsibility for organizing the Section. It was Dr. Smiley's suggestion that the Executive Council appoint someone as chairman of this Section for the purpose of trying to get the Section to become active. It was moved by Dr. Ferguson and seconded by Dr. Forsythe that Dr. Oberlander, of the University of New Hampshire, be appointed chairman of the New England Section.

The State of Illinois has been a section by itself, but to date no organization of the colleges in that state has been effected. It was suggested by the Council that the North Central Section of the Association invite the colleges and universities of the State of Illinois to attend the next meeting of the North Central Section, hoping that this might stimulate their interest in organizing their own section within the state.

The advice of the Council has been asked by representatives of some of the Negro colleges about the best means of organizing negro colleges for the development of student health work. After much discussion it was the opinion of the Council that since sections of the American Student Health Association are based on a geographical basis it would be better for the Negro colleges to form their own coördinate organization which might work with the Negro Intercollegiate Athletic group and other similar groups, and that the American Student Health Association will make every effort to assist in the establishment of such a coördinate organization and in the development of their program.

Dr. Smiley reported on the National Conference for Cooperation in School Health Education which he attended in New York City as a representative of the American Student

Health Association. It was the opinion of the Council that, since the American Student Health Association is very much interested in the training of teachers in health education and in the development of health programs in teacher training institutions, our Association should continue coöperation with this conference and send a representative to the next meeting. The Council voted to approve the expenses of Dr. Smiley for attending this meeting ($23.10).

The Council voted to ask members of the Association to participate in the observation of National Social Hygiene Day on February 1, 1940.

The question of continuing association membership in the American Council on Education was discussed by the Council. It was moved by Dr. Forsythe and seconded by Dr. York that we continue this membership for at least another year. The motion was passed.

The secretary presented to the Council the suggestion of one member of the Association that a special Ear Health Committee, similar to the Eye Health Committee, be established. Although recognizing that the problem of hearing loss in college students is one that has received little attention, it was the general expression of opinion of members of the Council that it would be wiser to suggest to the Health Service Committee that this problem be given consideration rather than to appoint another special committee.

The report of the Executive Council was approved by the Association.

Ruth E. Boynton, M.D.
Secretary-Treasurer.

Minnesota State Board of Medical Examiners

Julian F. DuBois, M.D., Secretary
230 Lowry Medical Arts Building
St. Paul, Minnesota

DOCKET OF CASES

Ely "Rheumatism Doctor" Sentenced to Six Month Jail Term

Re: State of Minnesota *vs.* J. F. Brown, *alias William Brown*

On December 14, 1939, J. F. Brown, also known as William Brown, 64 years of age, of Ely, Minnesota, entered a plea of guilty before the Honorable Edward Freeman, Judge of the District Court of St. Louis County, at Virginia, Minnesota, to an information charging him with practicing healing without a basic science certificate. After a statement of the facts to the Court by Mr. John Arko, Assistant County Attorney, Judge Freeman sentenced Brown to a term of six months on the St. Louis County Work Farm. Judge Freeman told Brown that, after he had served 30 days of the sentence, the Court would suspend the remaining five months and place Brown upon probation for one year, upon the condition that he absolutely refrain from practicing healing in any way, shape or manner.

Brown, a Negro, who gave his birth place as San Antonio, Texas, was arrested on December 13, 1939, following an investigation by Mr. Brist on behalf of the Minnesota State Board of Medical Examiners, which investigation disclosed that Brown had been representing himself as a rheumatism doctor and had been giving various medications to patients for which he charged sums ranging from $1.00 to $2.00 per treatment. He also attempted to give massage treatments and used a so-called sun lamp in connection with his work. Upon being questioned, Brown admitted that he had no medical training whatsoever, but that he had been employed for many years as a shoe shiner and pants presser. He stated that he had lived at Houghton, Michigan, for 20 years and had been on the Minnesota Iron Range once before in 1927, after which he lived, for a number of years, at Duluth. He stated that because of his inability to find any work he turned to the unlawful practice of medicine to make his living. Brown's patients were men employed in the iron mines. Upon being questioned concerning the source from which he obtained his various medicinal preparations, Brown replied that he bought them from one H. P. Clearwater, Ph.D. The pamphlet indicates that Clearwater is a licensed pharmacist in the State of Maine.

This case again emphasizes the ease with which an unsuspecting public is victimized by unscrupulous individuals.

St. Paul Abortionist Sentenced to Two Year Prison Term

Re: State of Minnesota *vs.* Arthur N. Alexander

On December 9, 1939, Arthur N. Alexander, 48 years of age, entered a plea of guilty in the District Court of Hennepin County, to an information charging him with the crime of abortion. Following a statement of the facts to the Court by Mr. Brist on behalf of the Minnesota State Board of Medical Examiners, Alexander was sentenced by the Honorable Arthur W. Selover, Judge of the District Court, to a term of not to exceed two years at hard labor in the State Prison at Stillwater.

Alexander was arrested by the St. Paul Police Department at his residence at 78 North Smith Avenue on December 6, 1939, following the signing of a complaint against him by the husband of a 41 year old Minneapolis woman upon whom Alexander performed a criminal abortion on November 21, 1939. Alexander had gone to the home of this woman in Minneapolis and offered to perform this abortion for a fee of $25.00. He was given $5.00 at the time, but the balance was not paid for the reason that the patient became seriously ill and was removed to the Minneapolis General Hospital. The matter was referred to the Women's Bureau of the Minneapolis Police Department with Alexander's arrest immediately following. Upon being arraigned in the Municipal Court Alexander's case was continued and his bond fixed in the sum of $5,000.00. He later decided to plead guilty with the above result.

Alexander formerly held a license to practice chiropody in the State of Minnesota. This license was revoked by the Minnesota State Board of Chiropody Examiners on September 19, 1935, at which time Alexander entered a plea of guilty in the District Court of Ramsey County to an information charging him with practicing healing without a basic science certificate. For that offense Alexander was sentenced to a term of one year in the St. Paul Workhouse and placed on probation. Since that time, he told Judge Selover, that he had worked as a clerk and as a salesman for summer resort property. Alexander has had numerous difficulties with the law, having been arrested in St. Paul on eight occasions between 1933 and 1935, several of the charges against him being drunkenness. In the present case Alexander thought he should be placed on probation, but he was promptly told by Judge Selover that with his previous bad record, he did not deserve to be placed on probation, and accordingly was sentenced to the prison term. The investigation conducted in the current prosecution also disclosed that Alexander had performed a criminal abortion upon another Minneapolis girl for which he was paid the sum of $45.00.

The Minnesota State Board of Medical Examiners wishes to acknowledge the very fine co-operation received in this case from the Women's Bureau of the Minneapolis Police Department, and particularly from Lieutenant Blanch Jones, head of the Bureau, and Mrs. Edith Evans, police woman. Some splendid results have been achieved in Minneapolis in this class of cases, and a large portion of the credit is due to the very prompt and efficient investigations conducted by the Women's Bureau. It has been a pleasure for the Minnesota State Board of Medical Examiners to co-operate with that Department.

St. Paul Man Sentenced to Three Year Prison Term for Fraud in Obtaining Narcotic Prescriptions

Re: State of Minnesota *vs.* Morris William Herman, *alias* William Herman, *alias* William Stearn, *alias* William Sterns, *alias* William Gordon.

On November 15, 1939, Morris William Herman, 28 years of age, entered a plea of guilty to an information charging him

with a violation of the Minnesota Uniform Narcotic Act, and was sentenced by the Honorable Gustavus Loevinger of the District Court of Ramsey County, to a term of not less than two, and not more than three, years at hard labor in the State Reformatory at St. Cloud. The defendant was arrested on November 2, 1939, in the office of a St. Paul physician from whom he had previously obtained two prescriptions for a preparation containing narcotics, through the use of a false name and a fictitious address. The investigation leading up to the defendant's arrest was conducted by the Federal Bureau of Narcotics and the St. Paul Police Department. Upon being questioned by Judge Loevinger at the time of sentence, the defendant stated to the Court that none of the physicians had made any examination of him to determine whether or not it was necessary to prescribe a preparation containing a derivative of opium. In addition, the prescriptions disclose that one St. Paul physician wrote for the defendant at two different addresses within a period of four days. The defendant has a long criminal record dating back to 1928. On December 18, 1928, he was sentenced in the District Court of Ramsey County to a term of not to exceed five years in the State Reformatory at St. Cloud on a charge of assault with intent to commit rape. In March 1934, he plead guilty in the United States District Court at St. Paul, to an indictment charging him with possessing an unregistered still. At that time he was sentenced to two years in the United States Penitentiary at Leavenworth and fined $600.00. He served the sentence at St. Cloud, and he also served the sentence at Leavenworth. Between November 28, 1937, and June 22, 1939, he was convicted nine times in the Municipal Court in St. Paul on charges of drunkenness.

Herman obtained his first narcotic prescription from a St. Paul physician on October 14, 1939, by giving the name of William Sterns, 422 Como Avenue. The prescription called for 1 ounce of laudanum, 1½ ounces of olive oil and ½ ounce of turpentine. The prescription directed that the preparation be applied to the back as needed. The physician who wrote this prescription states that he made a partial examination of the defendant, and also made inquiry of a pharmacist to determine if it was possible to separate the laudanum from the olive oil and turpentine. Thereafter Herman obtained 19 additional prescriptions from eight St. Paul physicians, including the first physician he went to, or a total of 20 prescriptions in eighteen days. All of the prescriptions called for the same ingredients with the exception that in two of the prescriptions the amount of laudanum, olive oil and turpentine was doubled. Herman used the following names in obtaining the prescriptions: William Herman, William Stearn, William Sterns and William Gordon. In addition to the address of 422 Como Avenue, he used the following addresses: 473 Como Avenue, 66 Summit Avenue and the Empress Hotel. There is no such address as 422 Como Avenue, while 473 Como Avenue is the address of a family who have no acquaintance whatsoever with the defendant. Defendant admitted that he never lived at 66 Summit Avenue and had only been at the Empress Hotel on one or two occasions. He stated to the Court that the address of his parents was 203 E. Indiana St., St. Paul. A number of the physicians frankly admitted that they made no examination of the defendant and they have also expressed their regrets at being so careless in the prescribing of narcotics. The usual pretext advanced by Herman to obtain a prescription was to advise the physician that his own doctor was out of the city and that this preparation was the only one that gave his back any relief. On being questioned by Judge Loevinger as to what disposition he made of the preparation after obtaining it at the drug store, Herman rather vaguely described a "Dick Evans" to whom he delivered the preparation at a pool hall in the basement of the Hamm Building. The facts indicate that Herman is not an addict inasmuch as he was in jail for 14 days prior to being sentenced and he showed no withdrawal symptoms.

Agents of the Federal Bureau of Narcotics state that it is a simple matter to extract the tincture of opium from this preparation, and undoubtedly the tincture of opium is diverted in an unlawful manner to a person not entitled to receive it. The facts indicate extreme carelessness on the part of the physicians in the issuing of these prescriptions. It is a criminal offense for a physician to prescribe, administer or dispense any of the derivatives of opium, except in the bona fide practice of medicine. The Supreme Court of the United States has held that the test is the presence or absence of good faith on the part of the attending physician. Good faith can hardly be said to be present unless a patient is given a thorough medical examination before the physician prescribes any narcotics, irrespective of whether they are to be used internally or externally. In the second place, a physician should be extremely careful when a patient comes into his office requesting a prescription containing a derivative of opium, notwithstanding any pretext given by the patient about his own physician being out of the city. The medical profession should not undertake to decide whether or not a narcotic drug can be extracted from a preparation or diverted to an unlawful use. If they will confine their efforts to examining the patient to determine whether or not he needs such a narcotic preparation, it will then be unnecessary for the medical profession to assume the responsibility for any unlawful diversion of narcotics. Lastly, under the laws of the State of Minnesota, a violation of the Federal or State Narcotic Laws is a ground for the suspension or revocation of a physician's license to practice medicine. The State Board of Medical Examiners has repeatedly published warnings about the necessity of a physician refusing to write prescriptions or to furnish narcotics to persons who are not entitled to such drugs. Nevertheless, despite all the publicity that has been given on the subject, the medical profession permits themselves to be victimized and unless there is an improvement in this respect it will result in a criminal prosecution against the physicians and the suspension or revocation of their license to practice medicine.

Ramsey County District Court Upholds 5 Year Suspension of Lake City Physician's License

In the Matter of the Revocation of the License of GOTTFRIED SCHMIDT, M.D.

On November 6, 1939, the Honorable Carlton McNally, Judge of the District Court of Ramsey County, made an order affirming the five year suspension of the license of Gottfried Schmidt, M.D., of Lake City, Minnesota. Dr. Schmidt's license was suspended on December 16, 1938, by the Minnesota State Board of Medical Examiners following a hearing in which Dr. Schmidt was found guilty of advertising "professional superiority to, and greater skill than, that possessed by fellow physicians and surgeons," and of "conduct unbecoming a person licensed to practice medicine in the State of Minnesota and detrimental to the best interests of the public." Judge McNally in his order stated: "It is the opinion of the Court that the action of the Board of Medical Examiners was neither arbitrary, oppressive nor unreasonable, and that the evidence adduced before the State Board afforded a reasonable and substantial basis for the order made by the Board suspending Relator's license to practice medicine for a period of five years from December 16, 1938."

The testimony before the Medical Board showed that Dr. Schmidt represented to patients that he was able to diagnose diseases by having the patient place sputum on a piece of paper, which was then placed on the abdomen of either the patient or a woman employed by Dr. Schmidt in his office at Lake City, and then having the patient, or the person employed for that purpose, hold various medicines in their hand. The testimony also showed that Dr. Schmidt had represented to patients that he had a machine in his office by which he could broadcast treatments to patients without the necessity of the patients coming to his office. Letters were also received in evidence, written by Dr. Schmidt to various patients, indicating that the patients were afflicted with aluminum poisoning, avian tuberculosis and various other ailments. Dr. Schmidt was warned by the Medical Board in 1936, to desist from these practices. However, he paid no attention to the warning and a citation was served upon him which resulted in the hearing before the Medical Board and the suspension of his license. Thereafter Dr. Schmidt took an appeal to the District Court of Ramsey County, and the matter was heard by Judge McNally on October 21, 1939. The records of the Medical Board show that Dr. Schmidt was born in Minnesota in 1871, and graduated in 1903, in medicine from the University of Minnesota.

Societies

TRANSACTIONS OF THE MINNEAPOLIS CLINICAL CLUB

Stated Meeting
Held November 9, 1939
The President, Dr. James K. Anderson, in the Chair

LARGE INTRATHORACIC PNEUMATOCELE APPARENTLY SECONDARY TO AN ENCAPSULATED EMPYEMA

Russell W. Morse, M.D.
Minneapolis, Minnesota

During the last fifteen years there have been many reports in the literature of pneumatoceles or so-called air-cysts of the lungs. This condition has commonly been called cystic disease of the lungs and almost universally considered the result of congenital maldevelopment. More recently the analysis of these cases has become more critical as various observers have had the opportunity of observing the development of intrapulmonary and other intrathoracic pneumatoceles from an inflammatory lesion. We wish to present this evening a case of a large intrathoracic pneumatocele which, we believe, formed as the result of drainage of a localized empyema by spontaneous rupture into a bronchus, persisted relatively unchanged for six years, then became infected and has subsequently shown a marked retrogression in size. We are indebted to Dr. L. R. Scherer for the opportunity to present this case.

Case Report

The patient, J. B., was admitted July 4, 1933, at the age of 9 years, to the infirmary of a boys' camp, complaining of general malaise, pain in the right side of the chest, and fever. He had no previous severe illness. These symptoms persisted and after several days he was returned to his home. A portable X-ray examination (Dr. A. Stenstrom) showed the findings of a lobar pneumonia involving the right upper lobe, the pneumonia shadow terminating sharply at the transverse interlobar fissure. In the lower part of the right lung there was a slight lobular pneumonia. These roentgenograms have been lost and are not available for review.

On July 11, 1933 he was admitted to Deaconess Hospital; temperature was 102° F., respiration 50, and there were physical findings of lobar pneumonia of the right lung. At this time there was abdominal rigidity. Throughout the acute illness there was pain in the right side of the chest and nonproductive cough. The temperature varied between 101 and 102° F. until July 16, when it dropped to normal for two days. It then rose to an average of 101° and was septic in character. It returned to normal July 28 and remained normal until his discharge from the hospital on August 5, 1933. Two blood cultures were negative.

X-ray examination on July 12 (Fig. 1), the day after admission to the hospital, and the eighth day of illness, showed a homogeneous density involving the midportion of the right lung with less dense infiltration in other parts of the right lung. The distribution of the density and the displacement of the heart and mediastinum are quite characteristic of an encapsulated pleural exudate, secondary to pneumonia. X-ray examination (Fig. 2), on the fourteenth day of illness, July 18, showed an air pocket in the lateral lower middle portion of the right thorax. In the upper part of the right lung there was a homogeneous density which one would interpret as pneumonia. There had been no expectoration of pus. Subsequent X-ray examinations on July 24 and 27 (Fig. 3) showed an increase in size of the air pocket and partial resolution of the infiltration in the lungs.

After returning home on August 5 the patient remained in bed for four months, still with a slight degree of fever. There was gradual improvement in his physical condition with return to normal health. He remained well, with the exception of several colds each winter, until the fall of 1938. During this

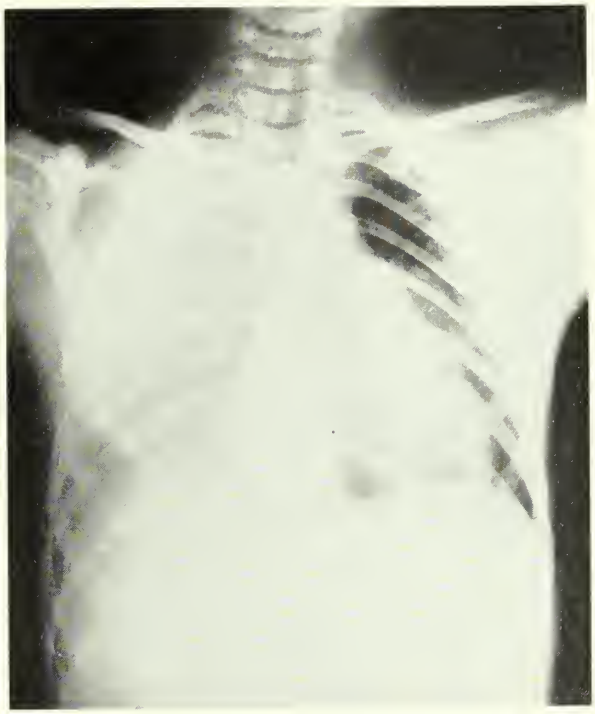

Fig. 1. J. B. July 12, 1933. Pneumonia of right lung. Displacement of heart and mediastinum to left. Slight lobular pneumonia of left lung.

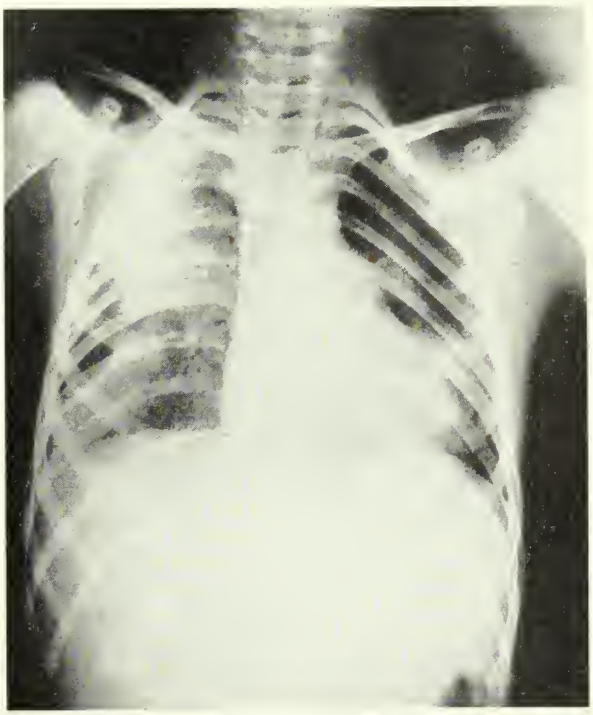

Fig. 2. J. B. July 18, 1933. An air pocket has appeared in lateral middle portion of right thoracic cavity. Partial resolution of the pneumonia.

Fig. 3. J. B. July 27, 1933. The air pocket has become larger, the expansion due to ball valve action of communication with a bronchus. The heart and mediastinum have returned to more normal position.

Fig. 4. J. B. June 14, 1938. The air pocket is larger than in 1933 and is more superior in position. At this time the patient was free from symptoms.

period there was no history of bronchitis, pneumonia or chest pains. X-ray examinations were made of the chest by Dr. G. T. Nordin May 22, 1937, and June 14, 1938 (Fig. 4). These showed a thin-walled pneumatocele in the midportion of the right thoracic cavity, the appearance being the same at both examinations. The pneumatocele was considerably larger, actually and relatively, than the air pocket observed during the acute illness in 1933. In the fall of 1938 the patient developed a high fever, with pain in the back and chest. This illness lasted three days.

On May 12, 1939, he again acquired an upper respiratory infection with a high fever, 104° F, was very toxic and complained of terrific pain in the back and chest, particularly on the right side. The temperature returned to normal in 36 hours. Three or four days after the temperature returned to normal he noticed that while in certain postures in bed, fluid would drain from the lungs into the throat. An X-ray examination (Fig. 5) was made ten days after the onset of the illness and showed that there had been no increase in size of the pneumatocele but that its walls had become thickened and that it now contained a small amount of fluid.

A lateral view (Fig. 6) showed that the pneumatocele occupied the upper anterior quadrant of the right side of the thorax and that at its lower margin there was a thickening of the interlobar pleura. There was rapid improvement in the patient's condition and subsequently the patient has remained well. A check-up examination was made October 3, 1939 (Fig. 7), and much to our surprise we found that the pneumatocele had become very much smaller and its walls were again thin.

Looking backward at the sequence of events and at the changes which have occurred in the pneumatocele, one must consider several possibilities as to the etiology of its formation.

First, one must consider the possibility that a congenital or developmental cyst was present before the onset of the pulmonary infection in 1933 and that the cyst drained through a bronchus, leaving an intrapulmonary air pocket. The recent diminution in size of the air space does not absolutely rule out this possibility. Against it are the reported findings from the first X-ray examination of a lobar pneumonia of the right

Fig. 5. J. B. May 22, 1939. The air pocket contains fluid and the walls of the pneumatocele have become thickened. At this time there was drainage of fluid into a bronchus.

Fig. 6. J. B. May 22, 1939. Lateral roentgenogram showed situation of pneumatocele in upper anterior part of the thorax.

Fig. 7. J. B. Oct. 3, 1939. Following the infection of the air pocket in May, 1939, the pneumatocele has become very small and its walls have become thin. The patient has been free from symptoms three months.

upper lobe, the shadow terminating sharply at the line of the transverse interlobar pleura.

Second, the original interpretation of the air shadow during the acute illness in 1933 was pneumothorax, presumably on the basis of a rupture of the lung. It has been our experience that this sequence of events usually leads to a more diffuse pneumothorax, but Dr. Rigler will probably show you an instance of localized expansive pneumothorax of this type.

Third, changes in the lung from the inflammatory process might have produced an obstructive peripheral lobular emphysema with the formation of an intrapulmonary air pocket. This is a very possible conclusion and it is unfortunate that the benign clinical course during the recent illness did not justify a diagnostic pneumothorax to determine more accurately whether the pneumatocele was in the pleural cavity or within the lung.

Because of the X-ray findings when the patient was admitted to the hospital July 12, 1933, it is our opinion that this pneumatocele developed as the result of an encapsulated empyema which drained spontaneously into a bronchus, the air pocket subsequently becoming larger due to a ball-valve action of its communication with the bronchus. Against this theory is the absence of a history of expectoration of fluid or pus as the time the air pocket formed. A study of the hospital record shows that severe cough was present throughout the illness and as the pneumonia resolved, the cough was recorded as being very loose. Yet at no time was there any production of sputum and it is frequently noted that there was no expectoration. This is unusual in a child 9 years of age. We believe, therefore, that an encapsulated empyema could have drained slowly into a bronchus and the fluid swallowed without any history of choking or expectoration.

Discussion

Dr. Leo G. Rigler: This is an extremely interesting subject to me from several points of view. One of these is the question of etiology of lung cysts. As Dr. Morse mentioned in the beginning of his paper, in the past we have rather assumed that all lung cysts were congenital in origin until the suspicion arose in the minds of some of us that such might not be true. Since that time there has been a good deal of work done to demonstrate that lung cysts may be acquired, as it is of some importance to know whether or not we are dealing with a true congenital lesion.

It may be occasionally demonstrated definitely that we are dealing with a congenital lung lesion, particularly if the specimen is available. If we can show that bronchial epithelium lines the wall of a large cyst it is pretty good evidence that it is due to a congenital process.

The other point that opens up is the question of differentiation between various types of pneumatocele. Dr. Morse used that term very frequently and I would like to use it frequently also because it doesn't hold one down as to whether we are dealing with an air cyst in the pleura or anywhere in the thorax. It is extremely difficult in some cases to make that differentiation. We have tried by demonstrating the pressure within the cavity to see if we could make some determination; but if it is assumed that there is a communication with the bronchus, whether it is a lung cyst or an intrapleural cyst, the pressure factors are going to be the same. A communication is always present; otherwise there would not be this continual accumulation of air within the cavity. We were notably unsuccessful in this endeavor. The same is true of the idea of injecting a contrast substance in the bronchial tree. We have injected lipiodol with the idea of demonstrating whether or not the lipiodol went into the cyst cavity on the assumption that if it did go in, it was a cyst and if it did not, it might not be. This again is purely a question of communication with the bronchus and whether the viscous lipiodol would pass through; in some cases it will not.

I have quite a number of cases to show for differential diagnoses. The first case we were particularly proud of because I think it is one of the first cases in this country in which it has been demonstrated quite definitely that an air cyst in the lung may develop in an acquired fashion.

(*Slides were shown.*)

This was a case reported by Dr. Reimann and myself some years ago. The patient had had a staphylococcic pneumonia. Follow-up study a year and a half later showed these enormous cavities to have disappeared with a complete residual cyst of the left upper lobe, filled with air, remaining. Later the cyst became

somewhat smaller, but persisted. It seems to me this is a clear demonstration of the development of an acquired air cyst of the lung. Peirce has also shown this same process occurring, particularly in the lungs of children.

The case reported by Drs. Platou and Swanson many years ago came to my attention at that time and in this instance a true congenital cyst was clearly demonstrated. This was present from birth. The cysts were filled with fluid and after injection with a contrast substance it was evident that the entire lung was represented by one very large cyst. Autopsy sometime later showed this case to be clearly congenital.

One must also differentiate the extreme emphysema which occurs in some individuals, both as a generalized process and as one with emphysematous blebs in a single local area. These simulate air cysts but can usually be distinguished by the general process elsewhere and by the complete absence of fluid within the cavity. Multiple bronchiectatic cavities, which are usually very much smaller, much more numerous and occur primarily in the lower lobes, must also be differentiated. Obviously, tuberculous cavities and non-tuberculous pulmonary abscess are readily differentiated by other characteristics which I have not time to go into at this time.

Dr. Morse's case was an extremely interesting one and I think brings out thoroughly the importance of careful study of such patients and the difficulties in the differentiation of intrapleural from interpulmonic abscess. I have one further case, similar to his, in a youngster whom we saw just a year ago. In this instance an encapsulated empyema in the left upper thorax developed following pneumonia. Drainage of the encapsulated empyema was successfully accomplished with apparent recovery; but, interestingly enough, several months later a large cyst in the pleura, which really is a tension pneumothorax, became evident. This has remained since that time without giving the patient any apparent symptoms. I believe that the possibility of re-infection of such a pleural cavity must be borne in mind, particularly because of the demonstration which Dr. Morse has so beautifully given us.

Dr. MALCOLM HANSON: This is a very interesting subject and a very instructive case. Since the institution of surgery as a satisfactory method of treating some cases of pulmonary tuberculosis, it is very important many times to differentiate between parenchymal cavitation and emphysematous blebs.

Brown and Sampson, of Saranac Lake, have demonstrated bronchial tuberculous granulated tissue which in some instances will produce a ball and valve action with resultant small areas of emphysema.

Dr. THOS. J. KINSELLA: This is a very interesting subject. I am particularly interested in this case because I happened to see this boy during the later part of his episode last spring. At that time I could not feel that anything should be done about it. He was apparently still harboring some secondary infection with slight cough and expectoration and a fluid level demonstrable in the pneumatocele. The establishment of a diagnostic pneumothorax would have definitely proved whether the cysts were pleural or pulmonary in origin; but because of the slight risk of empyema from the infection present, it was not attempted. I have a feeling that the cystic changes present are in the lung rather than in the pleura.

The finding of living epithelium of bronchial type in microscopic studies of a cyst wall does not prove the condition of congenital origin. An epithelial lining is frequently seen in bronchiectatic abscess and tuberculous cavities which certainly are acquired and not congenital in origin.

The problem of differential diagnosis between lung abscess, infected pulmonary cyst and loculated empyema is not always an easy one. In a child seen recently at the Minneapolis General Hospital the history, physical examination and X-ray failed to establish the diagnosis. Bronchoscopic examination also furnished no help. Finally microscopic examination of pus aspirated from the pocket revealed the presence of elastic tissue, thus establishing proof of lung abscess and destruction of lung tissue.

Fluid-filled cysts may remain intact for long periods of time and then rupture into a bronchus, the fluid at times inducing an aspiration type of pneumonia. If infected, such a cyst may present a picture similar to lung abscess and require similar treatment.

(*Slides were shown.*)

Dr. J. S. MCCARTNEY: I think one is going a little bit far to say that because a cyst has a certain kind of a lining, it is a congenital or an acquired cyst. I think all you can say is that the cyst has a certain kind of a lining.

We encounter these cysts in lungs as rare accidental findings at postmortem or else we miss them. Recently there was a lobectomy done at the University for multiple cysts of the lung. I wish Dr. Rigler had shown the picture of that particular lung because it is rather interesting. A number of small cysts were present in the lower lobe. When the lung was removed, we found in dissecting it that in one bronchus there was a mass about 1 inch long which proved to be the head of a timothy grass. This was apparently petrified but even so the botanists easily recognized it as the head of timothy. It blocked one of the bronchi leading to one of the cysts but a number of the other cysts had perfectly open bronchi and were entirely independent of this head of timothy. Microscopically there were a number of tiny cysts which were lined by a bronchial type of epithelium. In that particular instance the question is, were we dealing with both acquired and congenital cysts or were they all congenital and the timothy an accidental finding? We have no information as to how the head of timothy got in the lung.

CERTAIN ASPECTS OF RECENT TRENDS IN NORMAL HUMAN DIETS*

(Inaugural Paper)

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To say that remarkable advances have been made in the fundamental knowledge of human nutrition during the past few decades is most certainly a truism. This is brought out when we consider the strides which have been made between the not-far-distant era in which the proportion of carbohydrates, proteins and fats in the diet formed the chief subject for discussion and the present era of research in food chemistry in general and mineral and vitamin chemistry in particular. The field of vitamin chemistry has been particularly interesting as it has begun to throw light on some of the hitherto unexplained chemical processes in the animal body.

And yet, in spite of these brilliant discoveries, we continue to find ourselves in difficulty when it comes to applying this newer knowledge to the everyday task of finding a normal diet which covers all human requirements. While it is true that beneficial results can frequently be obtained both in preventing and curing certain conditions by adding various vitamin concentrates to the diet, to do this by diet alone usually presents a problem. In regard to the vitamins this difficulty is only partially explained by the fact that as our knowledge of these so-called accessory food substances has increased, their number and complexity have also increased. Perhaps the most persistent obstacle encountered is the frequent inability to transfer apparently clear-cut results of animal experimentation to human problems. In fact, frequent discrepancies arise in the results obtained in different species of lower animals. What is the reason for this? Does it not suggest a fundamental difference in the ability of different animals to utilize certain foods? It would seem to me that these difficulties have not been given enough consideration and call for a different approach to the problem, or at least a review of the differences in structure and physiology especially of the food receptive and absorptive organs of the various animals concerned. It is the purpose of this paper to point out some of the more obvious differences which exist among the higher vertebrates in this respect and to suggest certain simple conclusions which may possibly be drawn from them in regard to the human dietary.

It might be well to tabulate briefly the most abundant food sources of the important vitamin groups.

Vitamin A.

Fish liver oils, milk, butter, eggs, most animal livers. (Carotene): Green vegetables, carrots and other yellow pigmented vegetables.

Vitamin B complex.

Yeast, whole grains (germ, especially wheat germ), egg

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yolk; Liver, kidney, brain and muscle; tomatoes, cabbage, spinach, legumes.

Vitamin C.

Citrus fruits, tomatoes, green vegetables, milk.

Vitamin D.

Fish liver oils, fish body oils, egg yolk.

Vitamin E.

Grains (germ oil), lettuce, spinach, alfalfa, watercress.

As we review this list of foods, certain things stand out. For example, in the B complex group, yeast is generally considered one of the richest sources. To include this substance among normal human foods, however, requires the furthest stretch of the imagination. It is well known that yeast frequently produces a laxative effect on the bowels. This side-effect must be given due consideration in using yeast for any length of time. I recently saw a patient who had taken yeast regularly for a period of two years. At the end of this time she presented the picture of mental irritability, gastro-intestinal dysfunction and pigmentary changes in the hands suggestive of an early pellagra. There can be very little doubt that the chronic diarrhea produced by the laxative action of the yeast prevented proper absorption of the vitamins which it was hoped the yeast would provide.

If we examine the above food list further, we note that the whole grains, green leafy vegetables and certain roots occupy a prominent position. Are these normal human foods? It is obvious that certain groups of animals derive all or most of their sustenance from these foods. To this heterogeneous group the general term herbivora has been given. Does a study of the anatomy and physiology of the gastro-intestinal tract of these animals show any specialization in structure or function for the purpose of receiving and digesting these foods?

If the ratio of the body length to the length of the intestinal tract is compared in different mammals, we find a definite difference between the herbivorous and carnivorous groups. Man with a ratio of 1 to 7 or 8 approaches more nearly the carnivorous mammals. Alvarez contends that if measurements were taken on living organs *in situ*, the ratio in man would more nearly equal that of carnivora, such as the dog.

However, more important than this, is the observation that in all herbivora, a digestive tract with a roomy compartment somewhere in its course is necessary for the maceration, fermentation and solution of fibrous portions of food (Dukes). This may be provided in various ways.

In the ruminants (ox, sheep, goat, *etc.*) who remasticate their foods, a very capacious and complex stomach is found. It is composed of four parts or compartments—the rumen which accounts for 80 per cent of its capacity, the reticulum 5 per cent, the omasum 7 to 8 per cent, and the abomasum, 7 to 8 per cent. The rumen, reticulum and omasum are non-glandular and are lined by stratified squamous epithelium. The abomasum is the true, glandular stomach. It is from the rumen that material is regurgitated for remastication.

In grainivorous birds we find outpouchings from the esophagus known as the crop, which may either be single or double. In addition to this there is the stomach, which is divided into the glandular portion (proventriculus) and the powerful muscular organ, the gizzard, which, together with pebbles contained in the food, grinds the food into a liquid consistency. This is contrasted with conditions in carnivorous types of birds in which the esophagus is a straight tube with no crop, or a very rudimentary one, and in which the gizzard is very small or absent entirely.

In those herbivora with a comparatively simple stomach, notably the horse and related animals, the rabbit, the guinea pig and other rodents the roomy compartment is found in the cecum, colon or both. In the horse, for example, the cecum alone measures from 2½ to 3 feet in length and the colon is of such enormous size, that, if the abdominal viscera be exposed, it appears to occupy almost the entire abdominal cavity. In the rabbits and the rodents generally a large cecum is the rule.

Do we have any knowledge as to the manner in which these roomy compartments are utilized in the digestive process? While our knowledge in this respect is quite fragmentary, certain facts are significant. Up to the present time no enzymes have been found in the digestive tract of any of the higher animals which are capable of breaking down cellulose. In addition to this, peculiarly enough, in the domestic herbivora, at least, the saliva contains no ptyalin or amylase (starch-splitting enzymes). Apparently the sole purpose of mastication in these animals is to grind the food into small particles and to add to it considerable liquid saliva.

On the other hand it is well known that the grains and vegetables in general contain enzymes capable of splitting cellulose as well as starches. It is also well known that bacterial fermentation is capable of breaking down the cellulose as well as the starches. It is now fairly well established that these two processes are active in the rumen of the ruminants and in the crop of birds. These processes are notoriously slow and it is significant that food is known to remain in the crop and in the rumen for several days; for example, an ox that had been starved for seven days still had considerable food material remaining in his rumen. It is significant also that these roomy compartments with their nonglandular (non-acid producing) stratified squamous cell type of mucosa come ahead of the acid-producing stomach in the course that the food takes down the alimentary canal; hydrochloric acid is known to inactivate the enzymes and kill the bacteria which play a role in the fermentation process. Even in the so-called simple-stomach herbivora the mucosa of the fundus is known to be of the squamous cell, nonglandular type. In these animals, especially the horse, the food is deposited in layers as it comes from the esophagus, so that it may be some time before the upper layers are exposed to the action of the acid gastric juice. These animals, too, keep food in their stomachs for comparatively long periods; the rabbit for four days and the horse for twenty-four hours at least.

As regards the small bowel, the general tendency is to consider this organ to be much the same in the herbivorous and carnivorous groups. However, it has now been brought out that the reaction of the contents of the small intestine of herbivorous animals is definitely favorable to bacterial fermentation and that this process goes on to a considerable degree in these animals, whereas in carnivorous animals and man the reaction does not allow for bacterial fermentation, except possibly to a limited degree in the lower ileum.

The colon of herbivorous animals, especially those with a simple stomach, provides large sac-like dilatations either in the cecum or in more distal portions of the colon or both. Here bacterial fermentation plays the entire role in digestion of cellulose and a leading role in digestion of starches. These sac-like dilatations act as reservoirs where the bowel contents may be held for considerable periods of time before being passed on. This is in contrast to the colon of carnivorous animals, like the dog, and also—essentially—to the colon of man which are by comparison simple tubes where the food is passed on from one segment to the next without any considerable delay.

The gastro-intestinal tract of man, therefore, with its simple stomach, lined throughout by glandular epithelium, its nonfermenting small bowel and its comparatively simple colon approaches more nearly that of the carnivorous group of animals in structure and, according to our present knowledge, also in function. I might call attention to an observation made by Beaumont on his patient, Alexis St. Martin. He noted repeatedly that vegetable food was passed through the stomach practically unchanged. While some may consider the haustra of the large intestine as comparable to the sac-like dilatations of the herbivorous colon, it is generally recognized that the kneading movements of these haustra are chiefly for the purpose of water absorption and that any bacterial fermentation which exists is not comparable in quantity with that which occurs in the herbivorous colon.

It is obvious, of course, from practical experience, that the uncooked grains and grasses and also, to a large extent, uncooked vegetables and fruits are indigestible for man. One might well ask, Why not continue to cook them as we are now doing? The answer to this question is very important. Cooking these foods destroys the enzymes present and necessary to digest any remaining cellulose and to aid in the digestion of starches. Cooking also destroys the more heat-labile vitamins, such as vitamin B_1 or thiamin. Refinement of the grains, seemingly such an essential part of our present civilization, removes this and other vitamins.

It is an interesting fact that many of the classical examples of deficiency diseases on a large scale have been associated with

high carbohydrate diets, in fact, almost pure carbohydrate diets, as witness the polished rice diet of the sailors who developed beriberi and the maize diets of the pellagra districts in the south. Recent research has shown that vitamin B_1 (thiamin chloride) is essential in the intermediate metabolism of carbohydrates and that in the absence of this substance pyruvic acid (a product of incomplete carbohydrate metabolism) is deposited in nerve tissue. This, then, apparently, is at least a part of the pathologic picture in beriberi or polyneuritis. These studies have also shown, however, that in the absence of carbohydrates in the diet, vitamin B_1 (thiamin chloride) is not needed and that these deposits do not occur.

History teaches us that, generally speaking, those human races which subsist mainly on a carnivorous diet are more robust and are of a larger stature than those which use chiefly herbivorous foods. I cannot refrain from again calling attention to the observations of Steffanson in regard to the diets of the Eskimo and the experience of himself and his companions. The latter subsisted for two years solely on meat together with the fat, especially the meat lying next to the bones, bone marrow and some glandular organs. At the end of this period they uniformly felt better than they had before.

In conclusion, I cannot go any further than to raise certain questions. In the first place, the ability of the human digestive mechanism properly to utilize grains and possibly any considerable quantity of vegetables and fruits is certainly open to question. In the second place, the need for these substances except possibly in minor amounts in the human dietary is likewise open to question, provided energy requirements have been otherwise met.

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Discussion

Dr. ARCHIE H. BEARD: It has been a pleasure to hear Dr. Ylvisaker's excellent paper this evening. It contains a great deal of food for thought. I feel unable to discuss his work on comparative anatomy, but I wish to make a few comments on some of the other features of his paper.

A few years ago we thought we were becoming very proficient in the use of vitamins, and we believed many of our worries and troubles were over. It was suggested that in the future we might have our food served in capsule form, which would not require thought, proper concentration or diversification of carbohydrates, proteins, and fats. One realizes the fallacy of this statement when one considers that roughage and minerals are essential products and that it would be very difficult to supply them in this way.

We have derived information from certain diseases. (1) The individual on the low carbohydrate-high fat diet used in the treatment of diabetes develops acute respiratory infections less frequently than the individual on a normal American diet. (2) The diabetic on a high vegetable intake containing carotene and vitamins rarely develops acute respiratory infections. In the first we have a high vitamin D intake, and in the second we have a high vitamin A intake. In pellagra, scurvy, and beriberi we know the results of avitaminosis. A balanced diet is the best one for all of us, and it can be said that most of us live on a balanced diet.

There are thirty-seven different elements in our foods. These include carbohydrates, proteins, fats, minerals, and vitamins. The Council on Pharmacy and Chemistry of the American Medical Association has refused to recognize a concentrated capsule combining all the vitamins. There are certain facts about vitamins that we should know. Vitamin C is a sugar and vitamin D is a fat. We would not attempt to put into one capsule iron, iodine, copper and other minerals. For the same reason all the vitamins should not be combined. There has been considerable investigative work, but as yet we are not certain that our results on animals can be applied directly to man. There is marked economic wastage if all vitamins are put together in one capsule when they are not needed.

In the case of an illness due to the deficiency of one vitamin, is it not better to supply that one vitamin alone? Vitamin A and vitamin E are less potent if oxidation has occurred. In other words, they must be dispensed in some form in which they are not in contact with air. Vitamins A and E do not lose their potency when heated, but they do deteriorate when they become rancid. Vitamin C is unstable with heat and change in the hydrogen ion concentration. In most canning factories a copper vat is used. The copper given off into the canned fruits and vegetables may destroy vitamin C. Therefore, if we are going to use canned fruits and vegetables, the process of canning is important. If any iron or iodine is present, vitamins D and A lose their potency. At the present time A and D are the only vitamins that are not destroyed by canning. However, if these two vitamins are allowed to be oxidized they deteriorate. If vitamins A and B are given together, B is of little value. If vitamin C is given with A, it loses its potency. Therefore, when we give cod liver oil with orange juice, as in cases of scurvy, the patient does not get as much benefit as he would if the two were given separately and at different times. Vitamin D is toxic if it is given in large amounts, but, if vitamin B is given with it, it is less toxic.

It is known that in certain diseases we do not derive the full benefit of the vitamins. In gallbladder disease or in any biliary disease, all the vitamins are of less value. In the presence of any abnormality in the small intestine, such as gastroenterostomy or conditions in which there is a loss of gastric acidity, the vitamins lose their strength. If all the vitamins are to be given in one day it perhaps is better to give vitamins A and D in the morning, B at noon and E in the evening. By distributing the vitamins in that way, the individual secures the full effect of each vitamin and there is less economic wastage.

Dr. R. S. YLVISAKER: There are, of course, many aspects to this that can be brought up. I appreciate Dr. Beard's discussion in that he brought out some very important points about the vitamins.

I would like to mention one thing in regard to Alvarez's work and some of his conclusions. One of the things he called attention to was the fact that the Eskimos and other people who are found with good teeth use not only muscle as their source of meat or protein but they use glandular organs, bone marrow and the meat which lies next to the bone. This we know contains considerable quantities of calcium.

THE PRESENT SURGICAL MANAGEMENT OF ESOPHAGEAL DIVERTICULA*

STANLEY R. MAXEINER, M.D.
MINNEAPOLIS, MINNESOTA

Discussion

Dr. A. A. ZIEROLD: I feel that it is a privilege to hear Dr. Maxeiner describe his operation and review the procedures that have been in use over such a considerable period of time. In attempting to do something of the same sort myself sometime ago, I found it rather difficult to find a review or any very extensive account of what had transpired in the development of the treatment of esophageal or pharyngeal diverticula. I think that not only for his own contribution but for the collection of the various other procedures and the sequence of their development, we are indebted to Dr. Maxeiner.

You will notice in his account of what has been done that there has been a continual struggle against two-stage operations which is, of course, the history of most surgical procedures. You will notice that competent men in surgery are changing from one to the other as their experience prompts, perhaps not

*To be published elsewhere at a later date.

entirely satisfied with any of them. It recalls to your attention this one fact, that it would be much simpler, certainly much easier, to arrive at one standardized procedure if there were one standardized diverticulum, large or small.

I am satisfied in my own mind that the closest approach to a fool-proof operation for large diverticula is that of Lahey, but I am not at all satisfied that this procedure is satisfactory or at all easy in the small ones. I think that we are going to have to be satisfied with some variety in our operative approach, governed not only by the size of the diverticulum but also by the capacity of the individual who is undertaking the surgery. There is no question but that Jackson is competent to employ his own technique in conjunction with the esophagoscope. Moreover, men who have had experience, such as have Harrington and Lahey, can employ somewhat more complicated procedures in the smaller diverticula. While I am satisfied that in the larger diverticula Lahey offers a satisfactory operation, I feel that Dr. Maxeiner has offered the most satisfactory and the safest procedure for the smaller diverticulum. I am convinced, just from what I have heard this evening, that it is a procedure to which I shall resort the next time I have the opportunity of attempting to treat a small diverticulum.

I still believe that because of the variability in the size of the defect and the condition of the patient it is hardly wise to commit ourselves to any one particular method. I am impressed with Lahey's technique, and I think Dr. Maxeiner might well accept one point that Lahey has made. Dr. Lahey makes this point: that when the fundus is opened at the secondary operation and the mucosa is folded in, it must not be folded in to the level of the esophagus because the closure of the mucosa close to the wall of the esophagus would tend to produce a constriction at that point. He leaves sufficient excess of mucosa to permit healing without constriction. In Dr. Maxeiner's technique this point might well be taken; the forceps might better be applied at this level to protect against any possible scar contracture.

I have a feeling that this is a most ingenious technique, certainly the simplest and the nicest procedure of which I have heard. I have not heard of anything similar and to my knowledge there is nothing described in any way similar to this excepting the ligation with silk. In the smaller diverticula, I believe this would be as nearly fool-proof as Dr. Lahey's technique, and I am very glad that I had an opportunity of hearing Dr. Maxeiner. I think congratulations are due to him and to ourselves.

Dr. Frank R. Sedgley (*by invitation*) of the U. S. Veterans Hospital No. 106, discussed the clinical conditions surrounding the development of the case reported by Dr. Maxeiner and the aftertreatment.

Dr. Kenneth A. Phelps: My interest is not in the actual surgical removal of the diverticulum from the outside as much as it is the help the surgeon can get from the esophagoscopist working on the inside. Perhaps this slide will help demonstrate the etiology and the anatomy of this condition. (*A slide was shown.*)

The inferior constrictor muscle has a strong band at its lower extremity which is the crico-pharyngeus. This is the muscle Dr. Maxeiner referred to as being spastic and thus a factor in producing a herniation of the pharyngeal wall above it. The diverticulum is entirely in the pharynx and the term "esophageal" should be eliminated.

Dr. Jackson and his group seem to have success with the one-stage operation. Perhaps the routine use of the esophagoscope during the operation has something to do with it.

Dr. Stanley R. Maxeiner: I wish to thank Dr. Zierold for his discussion and his very complimentary remarks, and Dr. Sedgley for his remarks, perhaps a little less complimentary. Dr. Phelps' illustration and description of the musculature of the pharynx as related to the cause of diverticulum and its location were very instructive.

Lahey still insists on the two-stage operation. Undoubtedly any one-stage maneuver that opens the neck of the sac must connect with the contaminated interior of the esophagus and as a result there must be a contaminated wound. This is all the more pronounced when there is an inflammatory reaction within the walls of the sac in which case the lumen and the wall may be permeated by bacteria. Shallow made rather a sharp criticism of Lahey for his insistence upon the two-stage operation and included reference to his two-stage colon operation, contending that such procedures were a reversion to the horse and buggy days when in reality we are living in the days of the airplane. Lahey facetiously replied that undoubtedly some of the one-stagers were flying about, but not in airplanes.

We believe that with our aseptic removal of the sac we permit thorough walling off of the mediastinum before any contamination takes place.

Ernest R. Anderson, M.D., Secretary.

News Items

Dr. P. E. Logan, Great Falls, Montana, is the new president of the Cascade County Medical Society. Other officers are Dr. R. J. Holzberger, vice-president, and Dr. Frank Waniata, secretary-treasurer.

Dean Harold S. Diehl of the University of Minnesota Medical School has been appointed a member of the National Advisory Health Council of the United States Public Health Service. The primary function of this Council is to advise with the Surgeon-General concerning the scientific and research work of the Public Health Service.

Dr. John Moore, Grand Forks, North Dakota, was elected president of the North Dakota Public Health Advisory Council at its organization meeting in Bismarck January 12, 1940.

Dr. George L. Streeter, director of the Carnegie Laboratories at the Johns Hopkins Hospital, Baltimore, visited the University of Minnesota Medical School on January 17 and 18. He lectured before the medical faculty and students on "Early Stages of Macaque Development and Their Significance in Primate Embryology."

Dr. Fred Attix, Lewistown, Montana, was elected vice-president of the Western Surgical association at the 49th annual convention held in Los Angeles recently. Other officers named included Dr. Alfred Brown, Omaha, president; Dr. William Mills, Topeka, Kansas, second vice-president; Dr. Albert H. Montgomery, Chicago, secretary; and Dr. Verne Hunt, Los Angeles, treasurer.

Dr. Paul V. McCarthy, Aberdeen, South Dakota, is the new president of the Aberdeen District Medical Society. He succeeds Dr. J. D. Alway.

Dr. A. C. Strachauer, Minneapolis, has been elected chief of staff of Eitel hospital to succeed Dr. J. C. Litzenberg.

Dr. Albert V. Stoesser, associate professor of pediatrics, University of Minnesota, has received a grant-in-aid from the John and Mary M. Markle Foundation in support of his studies on water and electrolyte metabolism in intractable asthma.

Dr. Thomas Hawkins, Dr. R. Wynne Morris and Dr. E. H. Lindstrom, all of Helena, Montana, have announced the organization of the Northwest clinic in which they will be affiliated.

Dr. William A. Stafne, Fargo, North Dakota, was recently elected president of the Cass County Medical society. Other officers named were: Dr. E. H. Richter, Hunter, vice-president; Dr. Earl M. Haugrud, secretary-treasurer; and Dr. Frank I. Darrow, Fargo, censor.

Dr. T. L. Chapman, Duluth, was elected president of the St. Louis County Medical society at the annual meeting held in Duluth recently. Dr. Gordon F. Raiter, Cloquet, was elected vice president and Dr. Gordon C. MacRae, Duluth, re-elected secretary and treasurer.

Dr. R. R. Randall, Miles City, Montana, is the new president of the Southeastern Montana Medical association. Other officers are Dr. M. A. Schillington, Glendive, vice-president, and Dr. C. M. Lund, Fairview, secretary and treasurer.

Dr. J. J. Malee, Anaconda, Montana, was elected president of the Mount Powell Medical society at the annual meeting held at Galen state hospital recently. He succeeds Dr. L. G. Dunlap, also of Anaconda.

Dr. B. F. Osburn, International Falls, Minnesota, has turned over operation of the Northern Minnesota hospital to Dr. C. C. Craig and Dr. R. H. Monahan. Dr. Osburn, who has been connected with the hospital for 30 years, has retired from active practice of medicine.

Dr. O. W. Roberts, Owatonna, Minnesota, has been elected president of the Steele County Medical society.

Dr. Roy E. Christie, formerly of Orangeville, Illinois, is now practicing in Bowbells, North Dakota.

Mrs. John Dwan has made a gift of $5,000 to the Minnesota Medical Foundation for support of the program of the Human Serum Laboratory which was established at the University of Minnesota Medical School in 1938. The Laboratory is administered by a committee including Dr. Irvine McQuarrie, Dr. Paul Dwan and Dr. Erling Platou as a research and service project on the use of human serum for the prevention and treatment of certain infectious diseases.

Dr. D. Greth Gardiner, St. Paul, Minnesota, was elected president of the St. Paul Medical Forum at the annual meeting of the organization January 3. Other officers are Dr. Everett Hartley, president-elect, and Dr. Wallace Ritchie, secretary-treasurer.

Dr. L. E. Jordan, Chester, South Dakota, was elected president of the Third District Medical Society recently. Dr. Alonzo Peeke, Volga, was named vice-president, and Dr. D. S. Baugman, Madison, re-elected secretary-treasurer.

Dr. Herbert A. Carlson of Ah-Gwah-Ching, Minnesota, has joined the staff of the Northwest Clinic, Minot, North Dakota.

Dr. H. E. Hilleboe, St. Paul, Minnesota, has been named medical coördinator for the state department of social security and Dr. Malvin Nydahl, Minneapolis, chosen head of the Bureau for Crippled Children, formerly headed by Dr. Hilleboe.

The United States Chapter of the International College of Surgeons will hold its fifth assembly in Venice, Florida, February 11 - 14, 1940. An invitation to attend the meeting has been extended to all members of the medical profession.

Nine men and one woman were granted licenses to practice medicine and surgery in North Dakota after examinations conducted in Grand Forks, January 2-5, by the state board of medical examiners. The new physicians, announced by Dr. G. M. Williamson of Grand Forks, secretary of the board, are Laura K. Howard and Harold A. Christianson of Jamestown, Herbert A. Carlson, Minot, Cedric Northrop, San Haven, Paul T. Cook, Valley City, Verrill J. Fischer, Towner, John H. Bond and Ralph Weible, Fargo, Roy E. Christie, Orangeville, Ill., and Joseph F. Malloy, Thief River Falls, Minn.

The Eighteenth Annual Convention of the Woman's Auxiliary to the American Medical Association will be held in New York City, June 10-14, 1940, with headquarters in the Hotel Pennsylvania. In view of the fact that the second edition of the World's Fair will accelerate advance hotel reservations, it is urged that reservations be made immediately through the Housing Bureau which has been set up by the American Medical Association, namely Dr. Peter Irving, Room 1036, 233 Broadway, New York City.

ATTENTION SECRETARIES OF DISTRICT SOCIETIES

Space is at your disposal in The Journal-Lancet for advance notices and reports of meetings of your society and personal news items concerning members of your society. County and district secretaries are invited to forward such material to The Journal-Lancet, 84 S. 10th St., Minneapolis.

Necrology

Dr. George A. Kohler, 76, Minneapolis, Minnesota, died January 9, 1940. Dr. Kohler, who was an eye, ear, nose and throat specialist, practiced in Minneapolis from 1900 to 1939.

Dr. R. Lee Cram, 61, Park City, Montana, died at his home January 16, 1940.

Dr. Gisle Biornstad, 72, Minneapolis, Minnesota, died recently. He had practiced in Minneapolis for 30 years and was leader of the International League of Norsemen.

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Acute Infections of the Upper Respiratory Tract*

Henry L. Williams, M.D.†
Rochester, Minnesota

TO be logical and adequate, treatment ought to be based on physiology and anatomy. In none of the ailments of the body is a proper consideration of these factors of more importance than in the treatment of acute infections of the upper respiratory tract.

The upper respiratory tract as considered in this paper includes the nasal chambers, paranasal air sinuses, nasopharynx, pharynx and larynx, the eustachian tube, the middle ear and the pneumatic cells of the petromastoid. These structures are lined with a mucosa continuous with that of the nose and of similar structure except for the pharynx and larynx, which are lined with a flattened cuboidal nonciliated epithelium, and the cells of the middle ear and mastoid, which are nonciliated.

The nasal chambers are two narrow box-like cavities running in an anteroposterior direction from the nasal vestibules. The two most important structures in the nose are the inferior and middle turbinates. The covering of the nasal chambers is formed of mucoperichondrium and mucoperiosteum notable for the paucity of their white fibrous and yellow elastic tissues, for the lavish vascular network running through them and for the peculiar relationship of their arterioles and venules, in that at some place in their course the arterioles cross the venous return vessels in such a manner that dilatation of the arteriole compresses the venule. The lining of the nasal chambers is also noteworthy for the fact that beneath the epithelial covering of the inferior and middle turbinates are large venous sinuses running anteroposteriorly, the cavernous tissue of the turbinates. The surface epithelium in the functioning portions of the nasal chambers is of a ciliated columnar type and is well supplied with glands secreting both mucous and serous fluids. A considerable quantity of fluid also escapes by transudation through the capillary walls. This mixture forms a continuous mucous blanket over the surface of the mucosa, having a relatively fixed viscosity, which is moved at the rate of about 0.5 cm. a minute toward the pharynx.

This elaborate mechanism is wholly for the purpose of air conditioning, and the nasal chambers adapt themselves to changes in the environment by increasing and decreasing the amount of blood in the cavernous tissues and by alterations in the quantity of mucus secreted. The normal amount of mucous secretion varies from a pint to 2 quarts in twenty-four hours depending on functional demand. The function of the nose is to clean, warm and humidify the inspired air, so that by the time it reaches the choanae it is at body temperature, clean and saturated with water. The air currents are directed upward into the meatuses by the anterior end of the inferior turbinate. The inspired air is split into sheets so thin that in passing through the nose any particles of foreign material or bacteria will come in contact with the sticky mucous blanket and be engulfed. The nasal mucosa reacts to change of temperature not only when chilled or heated locally but when skin temperatures anywhere on the body are suddenly changed. These reactions are thought to be mediated by the autonomic nervous system, which is supplied to the nasal mucosa through the sphenopalatine ganglion.

*Read before the meeting of the Grand Forks District Medical Society, Grand Forks, North Dakota, March 15, 1939.

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Having briefly considered the location of our subject, we may pass on to the major consideration of this presentation, infections in the tract.

The disease which is most prevalent in our race and primarily or secondarily produces the highest morbidity and highest mortality of any is acute coryza. This disease has been shown by Dochez and his co-workers to be a virus disease with a secondary invasion of the mucosa by bacteria. A "cold" can be divided into two stages, that produced by the virus and that produced by the secondary pathogens. During invasion by the virus the mucosa is shrunken and dry, with a subjective stuffy sensation present in the nose; when the mucosa begins to be invaded by bacteria the stage of watery coryza sets in, which lasts usually one to three days. The secondary invaders, usually Streptococcus haemolyticus but occasionally Diplococcus pneumoniae or other organisms, stimulate the diapedesis of leukocytes into the nasal secretions and the mucopurulent secretion is produced. This ordinarily lasts a week to ten days. Numerous workers have shown the nasal mucosa to be normally sterile, but pathogenic bacteria may lurk in the lymphatic tissues of Waldeyer's ring, in a sinus, a tooth or elsewhere. The effect of the virus invasion is either to increase the virulence of the bacteria or to depress the normal resistance of the body to these organisms. In the ordinary coryza the termination of the stage of watery secretion is accompanied by a feeling of increased well-being. If, however, the secondary invaders produce disease in the sinuses or ears, this is apt not to be well marked.

The first therapeutic consideration in acute coryza is some method of prevention. Diehl has suggested in his work on this phase of the problem that the opiates have a definite effect in preventing the development and in decreasing the severity of acute coryza. The major effect of these preparations, however, in my experience has been in preventing the development of the coryza. After the stage of invasion has been passed they are of relatively minor value.

I have spoken of the effect of chilling of the body surfaces reacting on the nasal mucosa through the sympathetics. This effect is to produce a contraction of the arterioles in the nasal mucosa with the production of a dry glazed-looking mucosa. In other words, the adaptive mechanism of the nasal mucosa is inhibited. Because of diminished secretion the mucous blanket is incomplete and the inspired air in passing through the nose tends to take up moisture from the mucus, leaving a residue of increased viscosity which the cilia can no longer move regularly. The protective mucous blanket breaks, and the cilia are paralyzed both by the effect of drying and by the lowered temperature consequent to the reduced volume of blood supplied to the mucosa and to the increased volume of air passing through the nasal chambers. Viruses in the air or in the vicinity reach the unprotected mucosa and penetrate to the lymphatics and an acute respiratory infection is in full bloom.

This vicious circle can be broken by producing a vasodilatation in the nasal mucosa in the stage of invasion. For this reason the great vasodilator, alcohol, has deservedly borne a good reputation in combating "colds." Another old standby, the mustard foot bath, acts similarly to produce a general vasodilatation by raising the body temperature. The opiates act both by producing a vasodilatation and in addition probably by depressing the activity of the sympathetic nervous system, so that vasoconstricting reactions in the nasal mucosa do not follow chilling of body surfaces. It is probable that the inclusion of papaverine in the remedy by its relaxing effect on smooth muscle aids in producing a general vasodilatation and adds to the effect of the opiates.

It is quite obvious, however, that, once bacteria have penetrated the mucosa, the termination of the infection will be much more difficult to produce by such simple means and we must lean more heavily on the defense mechanisms of the body residing in the blood plasma, the leukocytes and the reticulo-endothelial system to combat the infection. Vasodilatation still may produce some curative effect by aiding in mobilization of these defense mechanisms, but once the stage of secondary invasion has been reached in the course of coryza, a great opportunity has been lost in preventing its development.

When the stage of secondary invasion has been attained by the disease, inflammatory reaction tends in itself to produce vasodilatation. Owing to the peculiar relation of the arterioles to the venules of the nose, in which arterial dilatation tends to shut off venous return, a state of passive congestion is produced with a tremendous swelling of the mucosa and transudation of fluid into and through the mucosa. The pressure of the swollen mucosa in the comparatively narrow nasal chambers produces the local discomfort consisting of headache and drowsiness which is one of the cardinal symptoms of acute coryza. The swollen turbinates completely occlude the airway through the nose, and mouth breathing must be resorted to. When the air conditioning for the respiratory tract has been removed in this way, its protective effect on the mucosa of the pharynx and larynx is lost, and drying, inflammation and bacterial invasion take place in these locations secondarily. Therefore, when the passive congestive stage of acute coryza has been reached, our efforts should be directed less toward producing a vasodilatation than toward reducing congestion.

In my brief consideration of nasal physiology I have mentioned that the nasal mucosa reacts to accommodate itself to environment. Therefore that environment which requires the least action on the part of the nasal mucosa should tend to lessen the physiologic response of the nasal mucosa and tend to reduce congestion. The environment in which the nose has the least work is one in which there are no irritants and in which the air is at a relative humidity of 100 per cent and at a temperature of 98.6° F. The effect of such a pneumatic environment can be observed in the noses of laundry workers, where a disuse atrophy of the nasal mucosa is evident in those who have worked at this occupation for some time. The use of a steam kettle to produce heat and humidity

is of great benefit in relieving symptoms and promoting recovery. I feel, however, that the use of the croup tent has little place in the treatment of upper respiratory tract infection because of the extreme wetness of the bedclothes and the patient produced by this therapeutic method. The chilling of the body surfaces produced tends to retard recovery.

In addition one should not forget that when the protection of the nasal mucosa has been broken through, a general infection has been produced, as is evidenced by the general reaction of fever, aching and malaise. Therefore, the place for the patient with acute coryza should be in bed, as a protection both to himself and to the rest of the community.

The use of the usual nasal drops and sprays containing irritants such as camphor, menthol, thymol and the like is mentioned only to be condemned. Stark, Proetz and others have demonstrated their irritating and destructive effects on cilia and epithelium. For somewhat different reasons epinephrine, ephedrine, Benzedrine (amphetamine) and other vasoconstricting drugs are to be condemned. These drugs act between the sympathetic endings and the smooth muscle of the arterial wall to produce their vasoconstricting effect. By the action of these drugs the reactivity of this region is reduced and tends to become exhausted and a secondary dilating effect follows the exhaustion produced by the drug, a dilatation which is of much greater duration than the shrinking effect produced. Therefore, the ultimate effect of the use of these substances is to produce an increasing and refractory congestion. The only place for use of these substances, as has been recently pointed out by Kennedy, is in the case of nursing infants who are unable to nurse if the nose is occluded. Hot packs placed over the nose and forehead of the patient produce a welcome sensation of comfort, as do ointments containing camphor or gaultheria rubbed into the same location.

The position of the patient in bed is of great importance in avoiding ear complications. The supine position tends to favor congestion of the respiratory mucosa owing to the action of gravity on the tissue fluids. The preferred position is sitting propped up on two or three pillows. This position reduces congestion and promotes drainage away from the nasopharynx and eustachian orifices. The patient should be warned against nose blowing as it tends to create a positive pressure in the nasopharynx, inflate the eustachian tubes and carry infection to the middle ear.

While these treatments are all of some effect, we must remember the aphorism, "A cold untreated lasts fourteen days while a cold treated lasts but two weeks."

If our efforts and the protective mechanisms of nature have failed to limit the infection, one of the complications of acute coryza may supervene. Acute pharyngitis may develop into one of the fulminating or necrosing types of pharyngitis or if certain species of streptococcus are present with the requisite exotoxin, so-called scarlatinal pharyngitis with a toxic dermatitis may supervene. Acute sinusitis may appear with its attendant chain of symptoms, or acute otitis media and mastoiditis may become evident. Rarer complications such as cervical lymphadenitis, pharyngeal abscess or septicemia will be disregarded in this discussion. Chest complications, being somewhat outside the field of the rhinologist, will be left to someone better able to discuss them.

In the treatment of the severer forms of upper respiratory infection sulfanilamide and related substances have assumed an important place. Those using this medicament are beginning to realize its dangers as well as its benefits. Its use should be accompanied by an extreme vigilance for the appearance of toxic symptoms such as fever or leukopenia. The severe headache and general malaise occasionally accompanying its use seem to be much benefited by the intake of sugars. The eating of hard candies and the ingestion of sweet drinks should be encouraged. In acute mastoiditis sulfanilamide has especial danger because it may suppress symptoms while the bone lesions are progressing to an alarming degree. Sulfanilamide in our hands does not seem to have had much therapeutic advantage over prontosil soluble, which is much less toxic. In all severe complications of acute respiratory infections, these drugs may be used with circumspection to great advantage when suitable organisms are found on culture.

Local treatment in acute pharyngitis should be administered by hot irrigations. Gargles are apt to be ineffective owing to the action of the superior constrictors in closing off the posterior pharyngeal wall from contact with the remedy. In acute tonsillitis, however, hot gargles at frequent intervals are of great benefit. If the tonsillitis is severe, particularly if a peritonsillar or lateral pharyngeal abscess is threatened, sulfanilamide is very useful. The dangers of tonsillitis are often insufficiently recognized. One usually thinks of peritonsillar abscess as the only important complication and this condition is not thought dangerous. Because they are so infrequent, complications such as lateral pharyngeal abscess with septicemia or erosion of the carotid artery are not recognized early. Yet death from metastatic abscesses is not infrequently reported from the former and sudden death from hemorrhage from the latter.

In acute sinusitis the greatest pain and discomfort are apt to occur in the presuppurative stage of acute inflammatory swelling of the mucous membranes. In this stage of the disease the extreme danger of puncture or lavage of the sinuses should be emphasized. If the bone is opened before the local defense mechanisms, which reside mainly in the reticulo-endothelial system, have time to become active, spreading osteomyelitis is prone to occur. Lavage of a sinus should never be attempted before the end of the first week of the disease and should preferably be delayed until later. I am sure nearly everyone has seen sinusitis made worse by too early puncture and lavage.

However, in the case of the frontal sinus, where the duct is long and narrow, owing to swelling of the mucosa, anaerobic conditions may become established. As the veins of the mucosa of the frontal sinus communicate freely with the veins of the diploe of the calvarium, acute osteomyelitis of the frontal bone may occur. Heilman and I have found evidence to indicate that an

anaerobic streptococcus is the usual cause of this condition. It advances in the veins of the diploe by a process of retrograde thrombophlebitis, the pericranium and dural surfaces being involved secondarily by communicating veins. If this condition is present, as evidenced by severe frontal pain, a generalized febrile reaction and edema of the brow, a small opening through the floor of the frontal sinus for drainage and aeration should be immediately made. As little as is consistent with obtaining these results should be done until some tendency toward localization of the process is exhibited. It should be remembered that bone lesions do not respond to sulfanilamide therapy, so that valuable time should not be lost by temporizing with this drug in this dangerous condition.

After pus has begun to form in a sinus, local treatment by shrinkage by the Dowling pack method, followed by gentle suction, seems the best. If the Proetz method of irrigation is used, the patient should be warned not to swallow during the treatment as this opens the eustachian tubes and has been said to produce otitis media. It is rare to find a case of acute sinusitis that will not get well under conservative treatment. Roentgen therapy has many adherents. In many cases a favorable effect apparently has been produced.

In acute otitis media with or without clinical mastoiditis the question about which there is the greatest discussion seems to be the value of myringotomy. I believe that if pain and high fever are absent, nothing is to be gained by this procedure and that often the condition will resolve under the use of ear drops and hot packs. Sulfanilamide is useful in otitis media and in the early stages of acute mastoiditis. Local treatment of acute mastoiditis should consist of strict rest in bed, attention to the cleanliness of the external auditory canal so that free drainage is not interfered with, and the local use of heat.

Practical Cooperation Between the Practicing Physician and Diagnostic Laboratory*

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AFTER twenty years of service as director of the State Health Laboratory of South Dakota, I feel qualified to discuss the subject I have chosen.

The legislative act which created the State Health Laboratory as one of the functioning units of the State Board of Health provided that the professor of pathology and bacteriology of the School of Medicine (now the School of Medical Sciences) be the director of this laboratory. The State Health Laboratory not only acts as a fact-finding agency for the State Board of Health but coöperates with the hospitals, clinics and physicians of the state the same as any other diagnostic laboratory. No laboratory of this kind is worthy of patronage by the hospitals, clinics and physicians unless its technical personnel is well trained and scientifically honest. An incompetent and a bluffer cannot last long in such a laboratory.

Since my advent in this laboratory, many changes, in keeping with well recognized and new diagnostic procedures, have been inaugurated. It has been our purpose to thoroughly acquaint the medical men of the state with the newer aspects of laboratory diagnosis and to continually seek their full coöperation so that the best interest of the public and their clientele may be served. Such coöperation is dependent largely upon an intelligent understanding. It has to a very considerable extent been accorded to us.

There is perhaps no one procedure of the laboratory that arouses more interest and is less understood than that concerned with the diagnosis of syphilis. Inquiries are frequently received in the laboratory from physicians over the state, concerning the significance of our reported findings in given cases. We are especiallly grateful to those physicians who graciously and frankly acknowledge their inability to evaluate the laboratory findings. A brief discussion of this phase of the subject appears to be timely and, we hope, may be helpful.

The majority of you know that for many years we have run the Kahn flocculation test along with the Wassermann test for syphilis. What you may not know is that these tests are standardized procedures, adopted not only by the leading serologists of the country but accepted now by the federal health agency. We shall attempt to point out the added advantage of this double testing later in this discussion.

One of the things that seems to be less understood than anything else connected with the serum diagnosis of syphilis is the *anticomplementary* reaction. This reaction is of frequent occurrence in all laboratories, and now, with the modern method of icebox fixation of complement, it is even more common. Several factors are operative, most of which can be controlled by the physician. Sera containing a large amount of syphilitic reagin may be anticomplementary even though it is properly collected and utilized at once. I wish to emphasize that an anticomplementary Wassermann reaction in a serum that gives a strong positive flocculation test (Kahn), especially in the presence of clinical signs of syphilis, should be regarded as positive unless repeated tests in the same and other laboratories proves it otherwise. In

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our laboratory we have found almost invariably that such sera actually possess syphilitic reagin. The most common cause of an anticomplementary reaction is the age of the serum. Serum allowed to stand at room temperature for any length of time often assumes this property; infected sera does the same and in our laboratory we have found that the serum from hemolyzed blood is frequently anticomplementary. Hemolysis is most apt to occur during extremely hot or cold weather while the blood is in transit. Some hospitals and clinics collect many samples of blood over several days and then send in the whole lot at once. Even though the serum is procured separately, the older specimens are apt to prove anticomplementary. Placing all specimens in the refrigerator as they are drawn and keeping them there until shipment would obviate much of this trouble. It would be even better to send the blood to the laboratory at the earliest opportunity.

False positive reactions may be obtained with both the Wassermann and the flocculation tests. They occur in all laboratories no matter how well trained, conscientious or exacting the serologist. Because of this possibility, the physician should not be unduly influenced by a single reaction of this kind, particularly in the absence of clinical symptoms of syphilis or a suggestive history. Eagle[1] states that there are three kinds of false positive reactions. These are: (1) *technical false positive* reactions, which are due to some error in the performance of the tests; (2) *biological false positive* reactions caused by the presence in the serum or spinal fluid of actual reagin in the absence of syphilitic infection, and in which both the Wassermann and the flocculation tests are persistently positive, and (3) the *anomalous false positive* Wassermann reaction, in which only the Wassermann is positive, the flocculation reaction is persistently negative and the patient presents no clinical evidence of syphilis.

No matter how well trained, honest or exacting the serologist; no matter if every step of the standard Wassermann technic is carefully followed, technical false positive reactions occur. The serologist is not at fault; the system is the accepted standard. Eagle explains this type of false positive reaction by assuming that a part of the complement is destroyed by a slightly anticomplementary antigen and a part is destroyed by a partly anticomplementary serum. The combined activity of these two agents thus destroys enough complement to prevent hemolysis. Hemolysis is dependent upon the combination of a definite fraction of complement combining with a definite fraction of amboceptor or hemolysin. It is the experience of many laboratories that "in the majority of cases in which the Wassermann test is persistently positive and the flocculation test consistently negative, the patient is found to be syphilitic." (Eagle).

In our laboratory, as in all other laboratories conducting both the Wassermann and the flocculation tests, one occasionally encounters a serum that persistently gives a negative Wassermann reaction and a positive flocculation test. This is due to the presence in the patient's blood of native amboceptor(hemolysin) which combined with the amboceptor added to the test, will produce hemolysis in the presence of a very minimum amount of complement not absorbed by the antigen, an amount of complement which otherwise would not be sufficient to produce this result. Such dual reactions should be interpreted as evidence of syphilis.

Reporting the Wassermann test as 4+, 3+, 2+ and 1+ should be abandoned. The degree of lysis has little or no significance. Thus a 4+ means there is enough syphilitic reagin in the blood to absorb enough complement so that no hemolysis takes place, but such a reaction may occur in blood having only an optimum quantity of reagin while many syphilitic sera containing many times this amount would not react in any different manner. Most laboratories now report their serum reaction as *positive, doubtful, anticomplementary,* and *negative.* Reports of *doubtful* Wassermann or flocculation tests should not be ignored by the physician, especially if such reactions persist. These are particularly common in patients undergoing antisyphilitic therapy. In such cases it must be assumed by the physician that the patient is just as syphilitic as if his serum gave a strong positive result. The physician should know that doubtful reactions occur even in the best laboratories, due to technical error and not due to any lack of ability or conscientious application of test on the part of the serologist. The report *doubtful* Wassermann or *doubtful* flocculation test (Kahn in our laboratory) should not be ignored by the physician. When such *doubtful* reactions persist or when found in an individual having suggestive history and clinical findings of syphilis the test is strongly if not completely indicative that syphilitic reagin is present in the blood. When we find this type of reaction we advise that repeated tests be made not only in our laboratory but in some other recognized laboratory, and preferably with different types of tests. If subsequent tests are negative it may be assumed that no syphilis exists in the suspected case. "On the other hand, if a series of reports, such as *doubtful, positive, positive, doubtful,* are obtained by testing at intervals of three to seven days, and if somewhat more sensitive tests give consistently positive results, the doubtful report clearly indicates the presence of reagin, and thus of syphilitic infection" (Eagle). The highly sensitive tests such as the Kolmer-Wassermann, and flocculation tests of Kahn, Eagle, and Kline yield only about 0.1 per cent of positive or doubtful in the absence of syphilitic infection.

One should not exclude syphilis on the basis of persistently negative tests by the various recognized methods for detecting syphilitic reagin in the blood serum. It is well known that a small per cent of individuals having definite signs of syphilis are repeatedly seronegative. The percentage of seronegative tests in all forms of syphilis runs all the way from only 1 per cent in early secondary syphilis to 15 or 20 per cent in tabes, paresis and diffuse meningiovascular syphilis. These percentages of negatives are apparently lowered 2 to 4 per cent by conducting a standard Wassermann test and a standard Kahn test on all sera. This constitutes one of the reasons why our laboratory persists in conducting both the Wassermann-Kolmer test and the Kahn flocculation test. This double testing is time consuming and more expensive but we believe it is eminently worthwhile. The

flocculation tests are simple, very accurate and can be conducted in a very short time whereas the Wassermann-Kolmer technic requires about 20 hours to complete.

Another thing to which the attention of the practicing physician should be directed concerns tissue biopsy. Here sympathetic, wholehearted, intelligent coöperation is essential to obtain the best results.

The great percentage of the tissue specimens received in the laboratory accompanied with the request "examine for malignancy" are not malignant. I have a feeling, however, that the operator submits many tissue specimens which he feels are not malignant, simply to fortify the opinion he has given the patient, and thus doubly assure the patient of the benign character of the lesion.

The fate of the patient depends on a correct report and it is the surgeon's duty to take the proper precautions in removing the specimen. For instance, it is not good surgery nor very helpful or fair to the pathologist, to remove only a part of a breast lump and send this to the laboratory. The malignancy may be in a minute area not included in the specimen removed. The pathologist reports "no evidence of malignancy"; soon a frank malignancy develops, a radical is performed and the patient soon dies. Under these circumstances the operator, quite humanly, perhaps, though not quite in keeping with fairness, may blame the pathologist for the mistake in diagnosis. Instances of this kind have come to our attention. We fortify ourselves against such contingencies by keeping representative slides of the tissue. When our attention is directed to incidences of this nature we send the slide to some recognized pathologist and then send his report to the physician. In other words, we simply "pass the buck" right back. The physician's conscience guides his actions. My reaction to this sort of thing is not one of irritation so much as one of outright regret that the doctor failed to do the right thing and thus may have unwittingly sacrificed the life of his patient.

There are many lesions such as old ulceration of the skin, lips, tongue and cervix that excite the suspicion of the surgeon. He may wish to have a microscopic examination and the opinion of the pathologist. If the lesion is unsightly, indolent, or progressive, if it does not yield to ordinary treatment, and especially if there is induration, his stand is well taken. In removing the tissue for examination, every surgeon should be guided by certain definite principles. It is worse than useless to procure a shaving of tissue from the surface. The excision should include the deeper tissue. It should be taken from the periphery and not from the center of the ulcer or crater. If some part of the lesion appears to be more indurated than the rest, excision should include part of this area, or if a part of the lesion shows more progressive destruction than another, this is the place to procure a specimen. Many, if not most cervical cancers begin in the cervical canal as a result of chronic endocervicitis. It is thus advisable to procure a cone-shaped piece of tissue by means of a circular incision around the canal. The cervix may be split open revealing the cervical canal and biopsy material removed from suspicious areas. It may be a good procedure to paint the cervix with Lugol's solution (Schiller's test), and remove a portion of the tissue from those areas that are not colored by this fluid.

Surprising as it may seem, we quite frequently receive surface shavings from ulcerated, eroded lesions, and some doctors pick off part of the scab which may cover the lesion and submit it for microscopic examination. This is a waste of precious time. I think it is good practice to entirely remove small, old, suspicious lesions of the skin and lip by wide and deep incision and then submit the whole tissue for microscopic study. Two worthwhile things have thus been accomplished: (1) excision of a lesion which may be malignant, with possible cure, and (2) study of the complete lesion both grossly and microscopically.

Malignant tumors of the rectum are adenocarcinomas. Here it is not often necessary to procure a deep section. However, within the last two months, we have received small bits of surface tissue from such lesions which showed no signs of malignancy, though other specimens procured by deeper excision showed definite malignancy.

No lesion causes more concern to the female patient than lumps in the breast and few things worry the physician as much. If the operator wishes to procure tissue for examination, he should remove the whole mass with some of the surrounding tissue. This should all be submitted to the pathologist. The lesion may be completely encapsulated yet at the same time it may show the histological attributes of malignancy. Such a lesion is not clinically malignant and if the pathologist sees that it is completely encapsulated he knows what to tell the operator. If, on the other hand, he gets only a portion of the lesion, and knows nothing about its gross anatomical attributes, he calls it malignant; the breast is removed, probably muscle, fascia are sacrificed and axillary space cleaned out. The patient remains well. The surgeon has cured another case of breast cancer.

Some surgeons remove the entire breasts in women when these show lumps or retraction of the nipple. Most breasts of this kind present themselves after the childbearing period. The surgeon probably feels that he might as well do a good job while he is about it, and that the women will no longer need their breasts as functioning organs or for esthetic purposes. Anyway, they are removed. When I first came to South Dakota I would get only small bits of such breasts to examine. I then asked, since I was sharing the responsibility of the surgeon, that he send me the whole breast in case it had been amputated, so that I could make a thorough survey of it. As a result of this we now get a considerable number of such specimens. Most of them show no malignancy, but now and then we find one or more small, characteristically hard areas which show the microscopic evidence of malignancy. This should be gratifying to the operator if not to the patient. The point here is, if the whole breast is removed and sent to the laboratory, it gives the pathologist a chance to explore the whole mass. He may find actual malignancy. I recall an instance where a doctor sent in a bit of tissue from a breast along with two axillary lymph nodes he was able to palpate. The breast tissue showed absolutely no evidence of malignancy but the lymph sinuses of both nodes con-

tained typical masses of cancer cells. The patient died within a year from metastatic cancer.

Intermenstrual bleeding always causes the physician some concern. Bleeding about the time of the menopause is frequent and especially worrisome as this is the time when many cancers of the corpus uteri develop. Many of the biopsy specimens received at the laboratory are bits of uterine mucosa removed because the patient is bleeding. In some of these cases we find definite glandular hyperplasia; in most of them we find nothing that can in any way account for the symptoms, and we find rarely a definite malignancy.

Some physicians send in a representative lot of uterine mucosa but all too many limit their contribution to a few minute shreds of mucosa with plenty of blood clots. An attempt should be made to procure the entire mucosal surface of the uterus if the possibility of overlooking an existing small area of early or incipient malignancy shall be avoided. A portion of the underlying muscular tissue should be included. Some clinics, hospitals and physicians always send in a representative lot of curetted tissue; others seldom or never succeed in doing so.

Radiographs of bone lesions often give just as reliable evidence of the true nature of the condition as does the microscope. Boyd speaks of the danger of performing bone biopsy in the presence of a sarcoma. The surgeon must penetrate the shell of bone around the tumor. This permits the sarcoma cells to extend rapidly into the soft surrounding tissue and soon produce a large fungating tumor, and perhaps an increasingly dangerous situation. In the study of tumors in general, but more particularly in the study of bone tumors the coöperation of the surgeon, roentgenologist and pathologist is essential to best results.

Biopsy material should be placed at once in five per cent formalin and then sent to the laboratory along with the pertinent anatomical and clinical data. This data is sometimes of indispensable value to the pathologist in arriving at a diagnosis in borderline cases. Furthermore, the pathologist, if registered, must be a physician with special training in pathology and much experience. If he is deserving of his calling, he is something more than a glorified technician. As a physician, practicing one of the specialties of medicine, he is entitled to the same consideration as any other medical consultant. As a matter of fact, I am convinced that the pathologist, particularly if he is connected with large hospitals, is the most valuable consultant and is usually so regarded by those with whom he works.

Biopsy material, especially curetted material and other small bits of tissue should never be sent to the laboratory wrapped in a piece of gauze, from which it can be removed only with difficulty. It is apt to be so dried that it is useless for microscopic examination.

Our laboratory is prepared to conduct blood chemistry tests. We will furnish outfits for the purpose of procuring and preserving such specimens. It is the opinion, nevertheless, that tests for most of the constituents of the blood give the most reliable results only with freshly drawn specimens. I would strongly advise that the physician utilize the services of the nearest laboratory in this connection.

The newest and quickest method of typing pneumococci is by the Neufeld's test. Sputum sent in to the laboratory can be examined at once and the type usually reported within one-half hour after receipt of the specimen. Sulfapyridine, now being used more and more extensively in pneumonia, is said by some to interfere with this test. It appears best, therefore, for the physician to procure sputum or swab specimens for typing, prior to the administration of this drug.

Microscopic Widal test, so long a standby in all laboratories, is rapidly being displaced by other tests. Most laboratories find it too unreliable. We recognized this several years ago and since that time have written to many physicians advising them to send in whole blood, just as is done for the Wassermann test. If this is done, enough serum can be procured to run the macroscopic agglutination in dilutions ranging from 1—40 to 1—500 or more along with tests for various infections closely simulating typhoid fever. This proves a much more reliable procedure. Furthermore, the blood clot may be cultured and yield reliable results positive for typhoid or similar infection. The best method in the diagnosis of typhoid fever is blood or stool culturing. This should be carried on in the early stages of the disease. Our laboratory is prepared to furnish containers with special culture medium to those who may want them.

When I first came to South Dakota I made no attempt to explain the significance of certain diagnostic terms, especially those that applied to tumor diagnosis. I felt that to do so would be considered presumptious. I had an early experience, however, that led me not to take too much for granted. One of the surgeons of the state sent in a biopsy specimen removed from a deep, localized lesion of bone. I made a diagnosis of "giant cell sarcoma—epulis type." About a year later I met the surgeon and he assured me that the patient from whom this tissue was removed was still alive and doing fine. He attributed this result to the fact that he had amputated the limb of which the involved bone formed a part. I did not have the temerity to tell this man that the tumor was one of benign attributes and that he would have effected the same result by thorough cleaning out of the tumor-like tissue with a curette.

As a final word I wish to state that if the personnel of any diagnostic laboratory does not realize its great responsibility to the physician and to the patient it serves, and does not continuously respond by conscientious effort to give honest, prompt, and reliable service, the laboratory of which this personnel forms a part has little or no excuse for existence. As a matter of fact, such a laboratory is potentially a menace to the public it serves through the doctors. The best service of the diagnostic laboratory to the doctor and his patient is dependent upon complete coöperation between the laboratory and the physician.

Reference

1. Eagle, Harry: Laboratory Diagnosis of Syphilis, St. Louis: C. V. Mosby Co., 1937, p. 302.

The Diagnosis and Management of the Surgical Gallbladder*

A *Review of 484 Cases*

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IN the solution of any medical or surgical problem, our ultimate goal is the relief of suffering. A constant effort to achieve a low mortality, a low morbidity, and to prevent the development of complications is our duty. On the subject of the management of the diseased gallbladder there has been considerable discussion and some variance of opinion as to the method used to attain the best results.

This discussion deals with a series of patients at the Ancker Hospital in St. Paul, Minnesota, over a ten year period from 1928 through 1938. These patients were attended by various members of the staff, thus the type of treatment employed expressed the general policy carried out on this service. The cases are classified as acute or chronic cholecystitis and will be discussed with their various complications.

The diagnosis of acute cholecystitis is usually not difficult. A patient with this condition gives a history of a severe attack of pain starting in the right upper quadrant of the abdomen or in the epigastrium. This pain frequently radiates to the back or the right side. There may be a normal temperature but oftener there is fever which may reach 102F or 103F. The attack is not infrequently accompanied by a chill. The white blood count is usually elevated and vomiting frequently occurs. There is tenderness with a varying amount of rigidity in the upper right quadrant of the abdomen.

There are other conditions that may produce symptoms similar to those of acute cholecystitis, and in making the diagnosis we must consider all diseases producing right sided abdominal pain. Prominent in this group are acute appendicitis, acute pancreatitis, and perforated or perforating duodenal or gastric ulcer. However, in the case of acute cholecystitis there is frequently a history of one or more previous attacks of abdominal pain, with a story of varying periods of indigestion, the attack frequently accompanied by jaundice. An analysis of the presenting symptoms with the usual evidence of localization and the past history pointing to previous gallbladder attacks narrows the diagnostic limits and usually points toward that of acute cholecystitis. After the diagnosis of an acute cholecystitis has been made, one has to decide on the procedure best suited for the individual patient. The advisability of performing an immediate operation on these patients is the subject of much discussion at present, and is comparable to that carried on several years ago regarding the relative merits of cholecystostomy and cholecystectomy. As mentioned previously, each patient presents an individual problem and the management of the case depends on the interpretation of the findings by the attending surgeon.

It may be stated as a general policy that on our service, immediate operation is meant to include any operation performed within forty-eight hours after the onset of the attack; an operation done after that period is considered a delayed operation. It has been our observation that most cases of acute cholecystitis show a tendency to subside during the first forty-eight hours after the onset, and that many of the acute cases studied in this series cleared up readily and were discharged without surgical treatment. There is a group of acute cases that do need surgical relief during the first forty-eight hours. These are the ones which show evidence of a fulminating process during the above mentioned forty-eight hours rather than a tendency to recession of symptoms. As soon as this type of patient is given the usual supportive preoperative treatment, an operation is performed. The patient usually found in this group is the one with a stone impacted in the cystic duct, and who, because of the edema and pressure from the impaction on the vascular supply to the gallbladder, develops a necrotic process with a resultant gangrenous gallbladder. In any situation in which one has to deal with the bad risk, it has always seemed to me more advisable to do no more than necessary to relieve the condition, leaving the more radical curative procedure to be carried out at a later date at an elective operation.

The fear of free perforation of the gallbladder is mentioned by various observers as an argument in favor of immediate operation in acute cholecystitis. A careful study of the material presented in this review tends to confirm our former belief that this danger is more apparent than real. In this group there were only four instances of free perforation and analysis of these cases showed that in one of them the conclusion was doubtful. Three of these patients were subjected to emergency operations and the fourth presented a picture that was not attributed to gallbladder disease. The patient suddenly went into collapse and died. The autopsy showed a free perforation of the gallbladder with bile peritonitis. The possibility of a free perforation should always be borne in mind and when present it calls for immediate surgical relief.

Twenty-six per cent of the acute cases showed jaundice and in many of these cases the jaundice subsided readily as the acute process receded. If, however, the

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jaundice is caused by common duct stones and an immediate operation is performed, a large proportion of patients will not be cured. The general opinion is against common duct exploration in acute cholecystitis.

No attempt is being made here to decide the question of whether one should or should not operate on all patients with acute cholecystitis, but the general plan followed by our group has been described.

Many of these acute cases were admitted to the medical service and some were discharged without a surgical opinion being given. There were two or three instances in which immediate operations would have been advised with possible benefit. It seems to me that it is just as important for the patient with acute cholecystitis to be seen by both surgeon and internist as for the patient with a head injury to be seen by surgeon and neurologist.

In considering the diagnosis of chronic cholecystitis I should like to quote from a paper written in 1887 by the late Dr. Justus Ohage, Sr., of St. Paul, Minnesota. Dr. Ohage performed the first cholecystectomy in this country at St. Joseph's Hospital in St. Paul, Minnesota, September 24, 1886. I quote from his report: "Mrs. L. A., Swede, 35 years, married, multipara, called at my office on September 23, 1886, complaining of constant pain in the right hypochondriac region extending to the right shoulder and stomach. This pain which commenced about three months ago had been preceded for the last three years by often repeated attacks of colic of variable intensity and duration. The pain always started from the right side. She had several times been jaundiced and suffered considerable from deranged digestion."

This description is not unlike the majority of cases that present themselves in which a diagnosis of chronic cholecystitis is made. Undoubtedly, the most valuable aid to the clinical examination and evaluation of the symptoms in these cases is the roentgenological examination which was so well developed by Graham and his co-workers.

In analyzing the results from X-ray examination of patients with chronic cholecystitis in this study, it was found that of the 361 cases, 222 had an X-ray study of the gallbladder. These patients were all operated upon and the findings at operation showed a remarkable record for the roentgenologist. There were five patients in which a negative X-ray report was given and at operation a chronic cholecystitis was found. Two patients who had a negative X-ray report showed stones in the gallbladder. Stones were reported on X-ray examination and none were found at operation in one case. There was only one case in which a non-functioning gallbladder was reported and at operation the surgeon reported a normal gallbladder.

Practically all the patients in this series were admitted with a history of sharp pain in the upper right quadrant of the abdomen or the epigastrium, and most of them gave a history of previous attacks and also of varying periods of dyspepsia that dated back from one to twenty or more years. It seems then that given a history of repeated attacks of upper right quadrant or epigastric pain often accompanied by periods of indigestion plus the aid of the X-ray examination, the latter having been demonstrated to be so accurate, that the diagnosis of chronic cholecystitis in most patients is not difficult.

Due to the fact that these cases are of variable duration, it is not infrequent to encounter very troublesome complications of which jaundice is probably the most common. The gallbladder may become a definite seat of infection that may cause some constitutional disturbance. Not infrequently patients seen with toxemia, acute infection, or extreme jaundice, are grave surgical risks. Where the disease is of long standing, extensive adhesions form between the gallbladder and the surrounding structures. Frequently the duodenum becomes adherent to the gallbladder and a cholecysto-duodenal fistula is formed. The larger gallstones passing into the intestinal tract are often the cause of intestinal obstruction. In a series of cases of carcinoma of the gallbladder, reported by Cooper, he states that the incidence of cholelithiasis was 79 per cent. Other observers have expressed the belief that stones were formed secondary to the carcinoma. Cooper feels that the weight of evidence is contrary to this view. In 48 per cent of his cases there was a history of colic of long duration, and many of the stones were of the calcified type which are known to form slowly. Cooper concludes that the evidence is definite that cholelithiasis predisposes to carcinoma of the gallbladder.

After considering the various conditions that may possibly develop as a result of a chronic infection in the gallbladder, we are faced with the problem of treating these various conditions. There are unquestionably many cases placed in the class of the surgical gallbladder that should be left to medical management. These patients are the ones that have a variable amount of dyspepsia with slight abdominal distress. The Graham-Cole test may show an impaired function, but under careful management the progress is very satisfactory. If, however, the symptoms persist or increase in spite of this type of treatment, these individuals should be considered as surgical problems. A patient with chronic gallbladder disease who has colic with marked gastric distress, and with the Graham-Cole examination shows a non-functioning gallbladder with or without stones, should be selected for surgical treatment, and, his general condition permitting, should be offered surgical relief. The earlier these chronic cases are operated upon, the better the operative mortality. There will be fewer cases of jaundice developing and it will eliminate the problem of an acute cholecystitis developing in the patient with a long standing chronic condition. In the group of chronic cases in this series it is definitely shown that there is a steady increase in the death rate as the age increases. It is also brought out that jaundice occurs in only 4.9 per cent of the individuals under 35 years of age, but increases in each group until it reaches 30 per cent in cases 70 or more years of age.

The problem of deciding whether jaundice is caused by an obstruction due to stones or some malignant proc-

ess has been less difficult since the Watson test has been used. This test is based on the quantitative determination of the urobilogen in the urine and in the feces. The experience with this method in our clinic has been very gratifying and is always used as an aid in this type of case.

I wish to present three cases that are good examples of the various complications frequently encountered when gallbladder disease has been present for some time.

Case 1. Miss N., 56 years of age, was admitted January 12, 1939, with deep jaundice, clay colored stools, and a history of indigestion for a period of six weeks. There had been a 30 pound weight loss. On questioning it was found she had suffered some epigastric pain when the present illness began. She stated that this was the only time she had ever experienced pain in the upper abdomen, but that she had had periods of gastric distress of varying duration for many years. The marked weight loss suggested that some malignant process was the cause of the jaundice. The Watson test, however, did not indicate a malignant jaundice, and under observation the jaundice cleared up. The X-ray revealed a non-functioning gallbladder with stones. The patient was operated upon February 22, 1939, and a large thick gallbladder, packed with stones, was found. The gallbladder was densely adherent to the surrounding structures. No stones were found in the common duct. The electrosurgical obliteration of the gallbladder, as described by Thorek, was carried out and the patient made a good recovery.

Case 2. A woman 67 years of age, was admitted on December 8, 1938, because of deep jaundice. She gave no history of having had pain at any time. There was a 35 pound weight loss over a six months period. The jaundice had been present six weeks. Abdominal examination was negative except for slight tenderness in the epigastrium. There was some doubt about the Watson test determination but was reported as showing a definite indication of a malignant obstruction. At operation on January 6, 1939, one large stone was removed from the common duct and she made an uneventful recovery.

This case brings up the question as to whether one should carry out an exploratory operation when a diagnosis is made of an obstruction due to a malignancy. It is our belief that unless there is some very definite evidence that no possible relief may be afforded the patient, these patients should all be explored, as occasionally a case will be encountered in which the obstruction is not a malignant one and a cure will be effected by removing stones from the common duct.

Case 3. This case is concerned with a cholecysto-duodenal fistula that was found during a routine gastro-intestinal X-ray examination. The patient had complained for some years off and on of distress in the upper right abdomen and epigastrium. She had periods of clay colored stools and had passed masses in the stool that had the appearance of stones. Some of these masses were examined by her physician and he stated that they were gallstones. The patient stated that she had passed such stones at various times during the past fifteen years.

It is generally recognized that coronary disease must always be considered when one is making a differentiation as to the cause of pain in the upper abdomen. That this differentiation is often a complex one is well illustrated by the following case:

Case 4. A man 70 years of age was seen for a mild digestive disturbance. He stated that he had been distressed for twenty-four hours. About twelve hours after the first examination he was seized with severe pain in the epigastrium and it was felt the pain was due to some gallbladder disease. The patient was also a diabetic. However, the man's appearance was that of a patient much sicker than one would expect from the symptoms he presented and a medical consultation was requested. The patient was hospitalized. In twenty-four hours he was jaundiced. The diabetic condition was controlled and in due time a diagnosis of a coronary thrombosis was substantiated. The jaundice cleared and it was felt that this was due to a common duct stone. The patient recovered and returned to work. After six months he suffered another coronary thrombosis from which he is recovering at the present time.

After considering the serious complications that arise in conjunction with chronic disease of the gallbladder, our attention should be directed to the necessity of earlier surgical relief in cases of chronic cholecystitis.

In the treatment of these patients, it is necessary that a very careful preoperative analysis is made of each case and all adequate preoperative preparation of the patient is carried out. The greatest care is exercised in the cases that are jaundiced. The use of vitamin K in the treatment of the hemorrhagic tendency in jaundiced patients has been shown by Snell and his co-workers to be of the greatest value. As yet we have had no experience with this method of treatment but will use it as soon as the substance is available.

Cholecystectomy is the operation usually performed by our group and was carried out in most of the cases in this series. It is not our practice to routinely explore the common duct. If there are indications of pathologic change in the common duct, the exploration is always carried out. It would seem that the common duct exploration renders the operation more serious and submission of the patient to the added risk is inadvisable if it can be avoided.

In some cases of the very large, thick-walled gallbladders in which a cholecystectomy would entail considerable dissection and bleeding, the electrosurgical obliteration of the gallbladder, as described by Thorek, has been very helpful. Dr. H. P. Ritchie of St. Paul, Minnesota, has also described an operation suitable for this type of case. In the selected uncomplicated cases, the removal of the gallbladder is not attended by a mortality of more than 1 or 2 per cent, but it is in the complicated cases and in patients of the older age groups that the mortality rises; it is in these instances that the above mentioned procedures will be of great assistance.

The results obtained in the treatment of the group of 361 chronic patients that were all operated upon shows a mortality of 5.5 per cent. Considering that this is not a selected group of cases and includes all grades of chronic cholecystitis with various complications, the mortality is comparable to that reported by other groups. Considered from a standpoint of surgical risk, the general standard of patients seen on a service at a general hospital is somewhat below that seen in private practice, and this fact undoubtedly has some bearing on the mortality figure.

SUMMARY

1. An analysis of 123 cases of acute, and 361 cases of chronic cholecystitis is presented.

2. It is felt that this analysis substantiates the methods of treatment used by the surgical staff of the Ancker

Hospital in St. Paul, Minnesota, in dealing with these patients.

3. The mortality in the entire group of 484 cases was 7.4 per cent. In the chronic cases, all operated upon, the mortality was 5.5 per cent. In the group of acute cases it was 13 per cent. In acute cases operated upon it was 21 per cent.

4. Early operation within forty-eight hours is not advocated except in patients who do not show a tendency to improvement in the first forty-eight hours after the onset of the attack.

5. If early operation is undertaken, gallbladder drainage is carried out and a more extensive procedure is later performed as an elective operation.

6. Patients having gallbladder disturbance and recognized as needing surgical relief should be operated upon before complicated situations develop.

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An Analysis of Some of the Factors in Personality Influencing Health*

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IN a discussion of these factors, we are as a rule not dealing with major mental disturbances, but they do involve the interplay of many peculiar attitudes on the part of the patient. An understanding of these factors must necessarily involve the total personality of the individual and the elements that constitute his total personality. It is obvious that there would be no personality if there was no physical and chemical structure at the basis of life. Too often psychiatrists neglect the physical structure and the biochemical make-up of the patient and miss some organic disease. On the other hand, the internist in his diligent search for some structural disease will fail to understand some simple problem in personality not based upon structural or biochemical disorder. He may concentrate his attention on disease, paying little attention to the patient as a person. He may have little regard for the factors which make the patient an individual distinguished from his fellows. Often he sees nothing more in the patient than the sum total of a disease which has a certain detailed symptomatology, etiology, prognosis, pathological anatomy, and medical or surgical treatment. More often the disease has been overemphasized and the patient has been overlooked. It is true that tremendous strides have been made in diagnostic methods and in laboratory medicine, but these advances seem to accentuate this tendency to forget the individual. The emotional life of the patient, his family pattern, his economic and social situations may be very essential factors in understanding the symptoms which he presents.

In discussing personality, therefore, I like to divide it up into five major parts. The first part has to do with the physical structure of the individual, the second part deals with his biochemistry, the third part deals with that great field of emotions, the fourth part has to do with his behavior and the fifth part has to do with his mind. The emotions include fear, anxiety, selfishness, jealousy, hate, anger, sex, love, courage, faith, *etc.* One's behavior is adjusted in some general way either to public opinion or to the laws of the state and the country. It is true that what constitutes adjusted human behavior today may be a maladjusted state of affairs tomorrow. In other words, human conduct and what constitutes human conduct varies considerably from time to time. The elements which go to make up the mind are constant: attention, comprehension, intelligence, judgment, memory, insight, stream of thought, ideation, sensorium, *etc.* It is obvious that the chief factor in the mind is that element which we call intelligence. All of these five factors which make up our personality have a relationship to each other and any disturbance in any one

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of these five parts will tend to upset the balance between the others.

Now, with this brief preliminary discussion, I want to call your attention to some of the common syndromes encountered in practice.

The anxiety syndrome was first described by Hecker in 1893, but did not receive general recognition in this country until after the World War. It has been known by many misleading terms, such as neurocirculatory asthenia, spastic colon, nervous exhaustion, nervous breakdown, shattered nerves, *etc.* The picture varies in the number, character and severity of the symptoms. This is dependent upon the underlying personality foundation of the individual. We must understand that every person is basically anxious and that anxiety syndromes may be symptomatic of other mental disorders, such as depression, schizophrenia and even organic disturbances associated with paresis, trauma and postencephalitis. The anxiety may be associated with some somatic disease, such as tuberculosis, cancer, diabetes or pernicious anemia. It usually occurs in an individual who is inclined to be tense and uneasy with transient attacks of palpitation, precordial discomfort, perspiration, dyspnea, weakness, giddiness and even fainting. One can elicit the fear of danger from within, the fear of illness or death or only a feeling of uneasiness of impending danger. The patient may complain of difficulty in sleeping, of being easily fatigued, of headache and often of a pressure on the top of the head or a band around the head. He may lose weight, be irritable and worry without knowing what about or why. Examination will usually reveal a tense, restless, uneasy individual with cold, clammy hands and feet. The pulse rate may be increased, the abdomen may be tender to palpation and the deep reflexes are usually overactive.

As stated previously, the differential diagnosis begins with a very careful physical, neurological and serological examination. In other words, one should be absolutely sure that the individual does not have either some structural disease of his body or some structural disease of his central nervous system. These symptoms may also be associated with an early paresis or a cerebral arteriosclerosis. We often hear that the diagnosis should be made entirely by exclusion but on the other hand we can find positive objective evidence of disturbance in the emotions. The physician must be prepared to spend sufficient time to be sure of the diagnosis and of the actual development of the illness in that particular patient. The anxiety and associated symptoms must be thought of as an expression of lack of function of the whole person or improper function of the whole person, and treatment should be directed against those factors which are the cause. Attention should be paid to the environmental factors. It may be necessary and possible to change occupational situations to relieve distress. The need for a thorough study of the endowment capacity of the person in relation to his situation is obvious. One should have a thorough acquaintanceship with the person's problems, his assets, his liabilities. Only then can specific measures be suggested for that individual. Engaging in a frank discussion of all of his problems and giving the patient an opportunity to express himself is a form of therapy and has been known as aeration or ventilation or purging. The physician can make proper suggestions, give the patient reassurance and re-educate him so that he can have a proper insight into the workings of his personality.

It is very important that therapy begin with the entrance of the patient into the doctor's office. The long initial interview and the subsequent interviews have a decided beneficial effect because they instill confidence in the patient and make him realize that the physician has a definite interest in his problem and can give him prospective relief. With adequate examination, explanation and detailed analysis, the majority of patients will be able to see the real nature of their illness.

It has been my experience that if the physician will take the time to explain the relationship of the symptoms to the underlying anxieties and fears, *i. e.,* by giving some common examples of somatic participation in such emotional states as anger, fright or excitement, the patient will not concentrate his complaints upon the subjective symptoms. These symptoms thus become understandable manifestations of emotion to the patient and he sees that they are common to most people. I always try to make the patient see that the symptoms are not imaginary but are the direct result of his emotions. The wise use of sedatives plays an important part in the treatment of an anxiety patient but one should never consider that the use of sedatives or hydrotherapy is the backbone of treatment. Anxiety syndromes can be treated. The simple measures outlined above, when used with foresight, sympathy, intelligence and persistence, bring about improvement in many cases.

Next to the anxiety disorder, one of the commonest problems in the personality disturbance is the disturbance in mood. As we look about us, we all realize that there are different patterns of mood in different individuals. We see the individual who is always "above the line" emotionally, who is an extravert, who meets people well and who lets his happy feelings influence his judgment and his behavior. On the other hand, we see the individual who is always "below the line," who is always somewhat depressed, who is not a good mixer and who usually has a poverty of ideas. Then we see a combination of both elation and depression in the normal or what has been called the normal emotional pattern. Some individuals are happy for a few days and then swing below the line and are unhappy for a period of time. Because of these variations in the mood, Bleuler has stated that all people in the world have a technical psychosis all the time.

It is apparent therefore, that it is somewhat difficult to state definitely where the normal variation in the mood ends and where the pathological variation begins. However, it is true that many people do swing above and below this normal variation in mood without any very apparent cause. In the overactive stage, there is an increase of psychomotor activity, with restlessness, ceaseless activity, playfulness, facetiousness, inattention to

sleep, food or care of the body. There is exultation of mood with frequent periods of irritability. On the decreased side, there is retardation or monotony of behavior, loss of initiative, interest and hope. There is self-accusation, loss of feeling, difficulty in concentration and a poor outlook toward the future. Most of these swings, whether in the elated or the depressed state, run a definite course or cycle and then the patient may be well for a long period of time. However, there may be a recurrence in a short period of time. One can never tell in a state of depression or in a state of elation just how long the individual attack will last, but as a general rule the younger the patient, the shorter the period of the attack. The patient will usually get along better if he is in a hospital or sanitarium during one of these pathological flights. The treatment usually consists in partial or complete isolation and management of the symptoms as they may arise.

The schizophrenic type of reaction is the shut-in, seclusive personality, with a tendency to live in a dream. There is a gradual development toward odd or impulsive behavior. The patient gradually becomes negativistic and shows a general inadequacy in his motor reactions. Auditory and visual hallucinations may appear. Delusions of reference and persecution are part of this personality disorder. There is emotional apathy or lack of emotional response, with lack of interest and bizarre behavior.

Recently, two types or modes of pharmacological shock treatment have been introduced; namely, insulin shock and metrazol convulsive therapy. It seems to me that it is still too early to comment with any degree of certainty or accuracy on this type of therapy. We have seen many improvements. However, many therapeutic attempts have been made in the past to cure the personality disturbances in schizophrenia with very little success. I once heard an eminent psychiatrist say that if a case of schizophrenia recovered, it must have been a case of manic-depressive psychosis and not one of schizophrenia. Certainly, one can say that the apparent good results which have been obtained in shock therapy have been in those cases where the disturbance has been recognized in a very early stage.

There is no doubt but that organic disturbances in the brain and toxic disturbances in other places in the body have a very definite effect upon the general personality of the patient. As I stated in the beginning of this paper, it is most essential that every patient be thoroughly studied from the physical, neurological, serological and metabolic standpoint. We must all remember that we are still doctors and that we should not invade the emotional field or study the behavior patterns and the fundamental functions of the mind until we have first looked carefully into the structure of the patient's body. On the other hand, it is just as important to know and understand the total personality of the patient as it is to know his physical and metabolic make-up.

Before concluding this paper, I would like to call your attention to a very definite group of individuals whose disturbance in personality is due to the fact that they are fundamentally defective. In this group, we have the feeble-minded person who is so intellectually defective as to be incapable of managing himself and his affairs. He requires supervision, control and care for his own good and that of the public welfare. There is also the inebriate who is unable to manage his own affairs and who becomes dangerous to the public by reason of the habitual and excessive use of intoxicating liquor, drugs or narcotics. We also have a large group known as the psychopathic personality. Because of emotional instability, impulsiveness of behavior, lack of customary standards of good judgment, failure to evaluate the consequences of their actions or a combination of these conditions, these individuals are socially or morally irresponsible, sexually or otherwise. As the result of such conduct they become a menace to the public good and require supervision. One might apply the term "defective delinquent" to the inebriate and the psychopathic personality. Most of these people are incurable and sooner or later must have permanent institutional care in order to protect the public.

I am indeed very happy to have had this opportunity of discussing the prospect of a closer union between psychiatry and general medicine. The mutual benefit of such a relationship will improve the standards of medical practice and help to get rid of the quacks who have caused so much disturbance. There should be a recognition, interpretation and treatment of the various personality disturbances that come to the attention of the general practitioner. There should be a better understanding of attitudes and facts in mental illness so that the general practitioner may gain a more wholesome understanding of life for his own sake as well as for those many patients with personality problems who come to him for aid. The general practitioner is intimate with the family of the patient; he constantly observes the family situations and he knows the strong and weak components of the personality of the patient. The family usually turn to the physician first for help. If the general practitioner would become interested, he is in a very excellent position to make a genuine and lasting contribution to the general mental health of the community.

Efficiency of an Intermediate Dilution of Tuberculin (P.P.D.) in Determining Tuberculous Infection Rate

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THE desirability of finding a reliable single test method in tuberculin testing has been cited by Hall[1]. Long[2] has shown that there is a definite element of non-specificity in the apparent positive reactions to standard second strength (0.005 milligrams) tuberculin (P.P.D.). This fact increases the desirability of finding a less concentrated single dose of tuberculin that would eliminate this non-specific reaction.

Hall reported the findings of 4,511 tuberculin tests using an intermediate dilution (0.000,5 milligrams in 0.05 cc. of solution) of purified protein derivative. The subjects of Hall's tests were school children and clinic patients from the state of Kansas in age groups ranging from less than one year to 79 years. As a result of these tests he concluded that the concentration used is not too strong and yet is strong enough to determine an accurate tuberculous infection rate in an area where the death rate from tuberculosis is relatively low, as it is in the state of Kansas. In his series of 101 cases with multiple tests there were three who gave a positive reaction to the full second strength test after giving negative reactions to the first and the intermediate strength tests. Nineteen cases were positive to the intermediate strength test after giving negative reactions to the first strength test. His studies show only four severe reactions to the intermediate strength test.

The fact that the intermediate dilution used by Hall failed to cause many severe reactions appeared to be further substantiated in June, 1937,[3] when we applied this test to 117 4-H Club health contestants and obtained only one four plus reaction in the group. However, there were three four plus reactions obtained in a group of 105 4-H Club health contestants tested here with this dilution in June, 1938. In June, 1939, 119 4-H Club health contestants tested similarly gave one four plus reaction. Thus, in 341 4-H Club state health contestants tested with an intermediate dilution of P.P.D. during the past three years 1.4 per cent of the positive reactions were four plus. However, 12.0 per cent of the 341 contestants tested reacted positively to the test. Chest X-rays of the 41 positive reactors disclosed no case of active clinical tuberculosis.

Plunkett and Siegal[4] using multiple dilutions of purified protein derivative in testing 1,747 inmates of the Newark State School for Feeble Minded found that 73.0 per cent of the total reactors were positive to the standard first strength test (0.000,02 milligrams), an additional 20.0 per cent were positive to the intermediate strength test (0.000,5 milligrams), and 7.0 per cent reacted only to the standard second strength test. This indicates that the intermediate dilution is very efficient in detecting tuberculous infection. The severity of reaction of the intermediate dilution used in their study was not determined. However, from their results they feel that the dilution used would cause a relatively high percentage of four plus reactions and that the optimum one-test dose of purified protein derivative may be less than 0.000,5 milligrams.

From this evidence and the fact that a large majority of the Kansas State College students are from Kansas, we decided that it was a safe procedure to apply this same intermediate strength test§ to students and to retest all negative reactors with the standard second strength test (0.005 milligrams).

During the regular 1937-38 school year 1,049 matriculating students were tuberculin tested. Each student was given an intradermal injection of 0.000,5 milligrams (intermediate dilution) of purified protein derivative. The result of each test was read 48 hours following the injection and in the absence of a positive reaction the second intradermal injection of standard second strength dilution was made. The result of the second test was read 48 hours following the injection. The results of these tests were classified according to the following method: *questionable*, the appearance of an area of swelling less than 0.5 centimeter in its greatest diameter; *one plus*, an area of swelling between 0.5 and 1.0 centimeter; *two plus*, an area of swelling between 1.0 and 2.0 centimeters; *three plus*, an area of swelling more than 2.0 centimeters; *four plus*, an area of swelling with definite necrosis. This classification is modified from the one given by the National Tuberculosis Association.[5]

Table 1 gives a tabulated summary of the results of these tests. Of the 1,049 students tested with the intermediate dilution 162, or 15.4 per cent of the group, had positive reactions. When the negative reactors were tested with the standard second strength test, there were 148 additional reactors making a total of 310 positive reactors. Of these 310 positive reactors only 52.3 per cent reacted to the intermediate dilution. These results

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§0.000.5 milligrams administered in 0.05 cc. of diluent. It is probable that the same dose of P.P.D. used in 0.1 cc. of solution would have enhanced the accuracy of the results.

TABLE 1
Summary of Intermediate and Second Strength Tuberculin Tests.

Race	Age	Sex	No. Tested with Intermediate P.P.D.	RESULTS					No. Tested with Second Strength P.P.D.	RESULTS				
				Quest'able	1+	2+	3+	4+		Quest'able	1+	2+	3+	4+
Caucasian	16	Male	15	0	1	1	0	0	13	2	2	1	0	0
Caucasian	17	Male	139	3	12	9	3	4	111	4	18	6	0	0
Caucasian	18	Male	276	5	18	14	2	4	238	1	40	9	2	0
Caucasian	19	Male	154	0	12	8	4	4	126	0	14	3	1	0
Caucasian	20	Male	72	3	6	7	2	1	56	0	8	3	0	0
Caucasian	21	Male	44	0	4	1	0	0	39	0	2	1	0	0
Caucasian	22	Male	20	1	1	3	0	0	16	0	4	1	0	0
Caucasian	23	Male	17	0	4	2	0	2	9	0	2	0	0	0
Caucasian	24	Male	8	0	0	0	1	0	7	0	1	0	0	0
Caucasian	25	Male	3	0	0	0	1	0	2	0	0	0	0	0
Caucasian	26	Male	3	0	0	0	0	0	3	0	0	1	0	0
Caucasian	27	Male	4	0	0	2	0	0	2	0	1	0	0	0
Caucasian	28	Male	1	0	1	0	0	0	0	0	0	0	0	0
Negro	18	Male	1	0	1	0	0	0	0	0	0	0	0	0
Negro	21	Male	1	0	1	0	0	0	0	0	0	0	0	0
Mongol.	22	Male	1	0	0	1	0	0	0	0	0	0	0	0
Caucasian	16	Female	10	0	0	0	0	0	10	0	1	0	0	0
Caucasian	17	Female	90	3	1	5	0	0	84	1	2	2	0	0
Caucasian	18	Female	113	4	1	7	2	0	103	1	8	2	1	0
Caucasian	19	Female	46	1	1	2	1	0	42	0	4	1	1	0
Caucasian	20	Female	11	0	0	0	0	2	9	0	2	0	0	0
Caucasian	21	Female	7	0	0	1	0	0	6	1	1	0	0	0
Caucasian	22	Female	6	0	0	0	0	0	6	0	1	0	0	0
Caucasian	23	Female	4	0	0	1	0	0	3	0	1	0	0	0
Caucasian	24	Female	1	0	0	0	0	0	1	0	0	0	0	0
Caucasian	25	Female	1	0	0	0	0	0	1	0	0	1	0	0
Negro	18	Female	1	0	1	0	0	0	0	0	0	0	0	0
TOTAL			1049	20	65	64	16	17	887	10	112	31	5	0
					Total positives—162						Total positives—148			

are in general similar to those obtained by Stiehm[6] and Canuteson.[7] Also, Myers[8] has recently pointed out the necessity of the two-test method to insure accuracy of results. A comparison of the results of the 1936-37[9] and 1937-38 groups (Table 2) indicates that there is not a great deal of difference in the efficiency of the standard first strength test and the intermediate strength test in detecting the incidence of tuberculous infection. The intermediate dilution gave a smaller number of four plus reactions with no appreciable difference in the number of questionable reactions.

From the results of these tests it would seem to be a safe procedure to try a more concentrated intermediate dilution in this section of the United States. However, Deegan[10] has shown in a group of 3,029 inhabitants of New York state, ranging in age from 1 to 72 years, who were tested with twice the concentration (0.001 milligrams) of purified protein derivative as that used in this series, that 12.5 per cent of all the reactions were four plus. In our series on college students only 5.48 per cent of the total positive reactions were four plus.

The incidence of tuberculous infection in this series and the sex distribution of the infected individuals are similar to those given by Long[11] for this section of the United States. Table 3 shows the distribution of positive tuberculin reactors according to the density of population in Kansas. As might be expected, there is a greater percentage of positive reactors in the group from larger cities than in the group from farms. Students from 99 out of a total of 105 Kansas counties were tuberculin tested. Positive reactors were found from 81 counties thus showing a wide distribution of tuberculous infection throughout the state.

All positive tuberculin reactors were offered chest X-rays at cost and approximately 96.0 per cent availed themselves of this opportunity. The radiological findings of this group of X-rays are summarized in Table 4. There were no cases of unquestioned clinical tuberculosis. There were suspicious radiological findings for adult type of tuberculosis in five cases. According to Harrington and Myers *et al*[12] the percentage of clinical tuberculosis for the college age period is one in two hundred to five hundred (1:200-500) positive tuberculin reactors. Eleven per cent of the cases X-rayed showed evidence of arrested or latent childhood type of tuberculous lung infection and the rest of the cases showed no evidence of tuberculous lung infection.

In conclusion, we believe that in an area with a relatively low tuberculosis death rate, such as Kansas, the intermediate strength dilution (0.000,5 milligrams) of purified protein derivative used in these tests does not determine the tuberculous infection rate with sufficient accuracy to replace the standard two-test method.

TABLE 2
Comparison of Standard First Strength Test (1936-37) and Intermediate Strength Test (1937-38) in Similar Groups

School Year	No. of Students Tested	RESULTS					No. of Positive Reactors with First Test	Total No. of Positive Reactors When Retested with Standard Strength Test
		Questionable	1+	2+	3+	4+		
1936-37	1,054	23	95	48	57	30	230 (21.8%)	336 (31.8%)
1937-38	1,049	20	65	64	16	17	162 (15.4%)	310 (29.5%)

TABLE 3
Distribution of Positive Tuberculin Reactors According to Density of Population

Population	No. of Students Tuberculin Tested	No. of Students with Positive Tuberculin Tests
Farms	451	102 (22.6%)
Less than 1,000	122	41 (33.6%)
1,000 to 10,000	187	61 (32.6%)
10,000 to 50,000	162	50 (30.8%)
Over 50,000	59	26 (44.0%)
Out of state	68	30 (44.1%)

TABLE 4
Summary of X-Ray Findings of Positive Tuberculin Reactors

No. of positive reactors X-rayed	299
Evidence of arrested childhood type of tuberculous infection	33 (11.03%)
Suspicious chest findings. Under observation	5 (1.67%)
Old pathological lung changes of non-specific etiology	19 (6.35%)
Negative findings for any form of tuberculous infection	242 (80.93%)

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VAN METER PRIZE AWARD

The American Association for the Study of Goiter again offers the Van Meter Prize Award of Three Hundred Dollars and two honorable mentions for the best essays submitted concerning original work on problems related to the thyroid gland. The Award will be made at the annual meeting of the Association which will be held at Rochester, Minnesota, on April 15th, 16th and 17th, providing essays of sufficient merit are presented in competition.

The competing essays may cover either clinical or research investigations; should not exceed three thousand words in length; must be presented in English; and a typewritten double spaced copy sent to the Corresponding Secretary, Dr. W. Blair Mosser, 133 Biddle Street, Kane, Pennsylvania, not later than March 15th.

A place will be reserved on the program of the annual meeting for presentation of the Prize Award Essay by the author if it is possible for him to attend. The essay will be published in the annual Proceedings of the Association. This will not prevent its further publication, however, in any Journal selected by the author.

Some Painful Conditions About the Head and Face

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OBVIOUSLY this discussion cannot include all of the conditions that may cause pain in the region of the head and face. Space does not permit a discussion of even all the neurological conditions in which pain about the head and face is a prominent symptom. For this reason I will confine myself to a consideration of certain clinical entities which may be confusing to one not thoroughly familiar with their differential symptomatology. These conditions are frequently encountered in general practice and, if properly understood, do not constitute grave diagnostic or, with few exceptions, therapeutic problems.

Physiologically, there are three distinct pathways by which painful sensations travel from the head, face and neck to the brain. The first is the pathway for superficial pain impulses. These impulses travel over the branches of the trigemini and of the first three pairs of cervical nerves to the brain stem, and ascend in the medial lemniscus to the thalamus. The second pathway is that for deep pain impulses. These impulses enter the brain stem through the sensory branches and connections of the vagus and glossopharyngeal nerves. After crossing a synapse in the nucleus of the tractus solitarius, these impulses also reach the thalamus by means of the medial lemniscus. The third pathway is that for deep pain impulses which are conveyed to the central nervous system through the cephalic portion of the sympathetic nervous system. This is a complicated network of fibers which enters the cranial cavity in relationship with the internal carotid artery. The pain resulting from involvement of these nerves is excruciating. It is a diffuse, deep seated, drawing, aching, and poorly differentiated type of pain. This will be discussed further in connection with atypical facial neuralgia.

As stated before, I will not attempt to discuss all of the conditions in which pain about the head and face is a prominent symptom. Rather than formulate a classfication of these conditions I will describe categorically some which, to me at least, have proven interesting from a clinical neurological standpoint.

Occipito-Nuchal Pain (ONP)

ONP as a symptom of cervical arthritis, greater occipital neuralgia, sphenoid sinusitis, and myositis of the nuchal muscles is well known and will be dismissed with mere mention. However, there is another type of ONP which, unless recognized and understood, might be confusing. It is the ONP seen in patients suffering from psychoneuroses of the anxiety type. The pain is continuous and, according to the patients' usually tearful description, unbearable. However, like so many other pains of functional origin, this type of ONP never awakens the patient from sleep. Upon careful questioning, one usually is able to ascertain that it is not the severity of the pain that makes it unbearable but it is the accompanying disturbance in the patients' emotivity. These patients are thoroughly frightened and are very emotional. In fact, when a patient is sent to me complaining of ONP and has a crying spell while giving the history, I think of the pain as probably being functional in origin.

It seems that in animals the nuchal muscles serve an important biological function. They are part of the defense mechanism of the organism. Anyone observing some of the quadrupeds in their native habitats notices that when the animal is startled or on the alert, it raises its head. It does so in order to be able to smell or to see an approaching enemy. In order to do so it contracts the nuchal muscles. It is possible that humans possess this biologically useful reflex in a vestigial form. When a human being becomes anxious or frightened, there is set up in the nuchal muscles a state of increased tension (hypertonus). Anxiety (chronic fear) produces in the nuchal muscles chronic hypertonus. Chronic hypertonus eventually becomes painful. An English investigator described actual lymphocytic infiltrations at the sites of insertion of the temporal and nuchal muscles on the skull. The pain resulting from such an inflammatory reaction is called "indurative headache." My conception of psychogenic ONP is as follows:

An individual, for some endogenous or exogenous reason, becomes anxious and tense. The anxiety produces in the occipital and nuchal muscles a state of chronic tension. This eventually becomes painful. To the average non-medical mind, the occipito-nuchal region is the "base of the brain." Any disorder at the "base of the brain" implies mental impairment. The threat of mental disease causes more tension and fear. More tension and fear result in more ONP, and thus a vicious spiral is established. In some cases the tension is transmitted through the galea aponeurotica to the top of the head, and then we have the "lead cap headache," or the "casque neurasthenique" of Charcot.

Evidence in support of this theory of the origin of ONP in the psychoneuroses is found in the fact that in many cases the pain is relieved by the administration of sedatives which relax but do not have any analgesic properties.

In some cases, emotivity is not disturbed to any great degree and the tension results from chronic fatigue due to overwork. The following brief case report illustrates this type of involvement.

Case 1. A. B. F., A 27 year old male executive, had a family and past history that was irrelevant to the complaint which he made to me. This complaint was to the effect that for two or three years prior to my seeing him he had been subject to occipital headaches. At first these headaches were intermittent, coming on during the latter part of the day. When I saw Mr. F., they had been continuous for about six months. A significant thing was the fact that, while the headaches never left the patient for an instant during the day, they never

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awakened him once he got to sleep at night. There were no concomitant symptoms to suggest migraine. Mr. F. stated that for several months he has been awakening in the morning "not feeling as I should." Furthermore, he had grown irritable and fussy and was losing interest in things about which he formerly was enthusiastic. He consulted an ophthalmologist who did not find any error in refraction, but thought that there was an early choked disc. It was for this reason that I was asked to examine the patient.

The neurological examination was negative throughout except for exaggeration of all tendon reflexes. All laboratory tests gave normal findings. Upon investigating Mr. F.'s work habits, I found that he had worked steadily for five years without a rest. During the past year several new departments had been added to his business and, after working intensively during the day, he would return to the office in the evening and frequently work until past midnight. He had a feeling as if he never could relax. There was considerable tension in the occipitonuchal muscles.

He was put on a closely supervised activity schedule and was directed to take a prescription containing opium and a bromide. He was told that his discomfort probably was due to strain and overwork, and that with proper rest and relaxation, his symptoms would disappear. In one week he reported improvement, and one month after I first saw him, he was able to resume a full working schedule without trouble. His eyegrounds remain unchanged.

The following report illustrates another type of case. Here emotivity is profoundly disturbed.

Case 2. Mrs. J. C. A., white, aged 36, was referred to me for treatment of nervousness. Her family, medical, and surgical histories were irrelevant to the present situation. Her present illness began four months previously with vague feelings of uneasiness and an ill-defined sense of impending disaster. As in many other cases of similar type, it was practically impossible to obtain from the patient a good chronological account of her illness. The date of onset could not be ascertained, the symptoms did not seem to have made their appearance in any definite sequence and the entire clinical picture was vague and poorly defined. However, when Mrs. A. was asked whether or not she had any pains or aches, she immediately burst into tears, placed the palm of her hand over the back of her neck and said, "That's it, Doctor, I have a pain right here that is driving me crazy!" The pain was continuous during the day, never leaving the patient for a second; yet it never awakened her from sleep at night. When I asked her if the pain frightened her she sobbingly related how the fear of losing her mind had haunted her since the beginning of her illness. She had consulted several physicians, had been given the usual "pep talks," had been told there was nothing wrong with her, and that she should "snap out of it." Each reassurance that there was nothing wrong with her discouraged her still more, and recently she had been contemplating suicide as a solution of her trouble. The physical and neurological examinations, as well as all laboratory tests, gave normal findings.

Unquestionably, Mrs. A. was suffering from a moderately severe anxiety neurosis, and ONP was her most prominent symptom. Under proper treatment with reassurance, psychiatric interviews, suggestion and mild sedation, she made a complete recovery.

It is remarkable how, after a few reassuring interviews, when the fear reaction is ameliorated and the patient taught to look at his difficulty objectively, the ONP subsides.

Migraine

Everyone is familiar with the classical clinical picture of migraine. However, there are many atypical forms of migraine which may be confusing. The important feature of all forms of migraine is their episodic occurrence. The symptoms always come in attacks or spells, and between times the patients feel quite normal. The pain may be localized in a small area, such as in back of an eye or in the upper or lower jaw, and it may or may not be accompanied by any or all of the usual concomitants of migraine, such as nausea, vomiting, photophobia, visual scotomata and prostration. Some patients describe aurae preceding the attack and disturbances in consciousness accompanying it. Sometimes epileptiform seizures accompany the pain in the head or face, and we are accustomed to think of a "migraine-epilepsy complex." In some cases severe edema of the eyelids or of an entire side of the face may accompany an attack. Inasmuch as most cases of migraine are on an allergic basis, a history of hay fever, asthma, hives, or food sensitivity, either in the patient or in some of the blood relatives is frequently obtained. The following case history is one of atypical migraine.

Case 3. Mrs. W. J. T., white, age 33, was referred to me by an otologist because of recurring attacks of severe pain in the left ear. The referring physician had satisfied himself that the pain was not due to any disease condition of the ear. Mrs. T.'s mother and two sisters had suffered from periodic headaches. Otherwise her family and past histories were irrelevant to her present complaint. The present illness began when Mrs. T. was about 14 years of age. At that time she began to have attacks of excruciating pain in her left ear. The pain came on suddenly, without warning, did not radiate, and sometimes was accompanied by nausea and projectile vomiting. It usually lasted an entire day and it would disappear if the patient could get to sleep. At first the attacks came on about two or three times a year, but during the past year had been coming on two or three times a month, usually more severely at the time of the menstrual period. The physical and neurological examinations, as well as all laboratory tests, gave normal findings. A diagnosis was made of atypical migraine and treatment instituted. Mrs. T. was placed on ergotamine tartrate by mouth, a low carbohydrate and high fat diet, and was directed to take a moderate dose of phenobarbital for four days preceding each menstrual period. She has been free from attacks for eight months.

The above case is interesting because it illustrates how the pain in migraine need not necessarily involve an entire side of the head. One occasionally sees cases also of abdominal migraine in which the pain is in the epigastrium and is accompanied by nausea and vomiting. Many of these patients have been subjected to exploratory laparotomy and no organic lesion found. Some give a history of preceding cephalic migraine, and they respond to one of the several forms of treatment of the disease.

Tic Douloureux

It has been said that if a diagnosis of tic douloureux cannot be made in the first five minutes, the condition under consideration is something else. In other words, there are certain definite criteria which must be met before one is justified in making a diagnosis of tic douloureux. First, the pain must be paroxysmal. The paroxysms usually last from a few seconds to a few minutes and then subside for a variable length of time. They may occur repeatedly over a period of days, weeks or even months and then disappear spontaneously, not to reappear again for a variable period, as long as several years. Second, the pain is *always* confined to the distribution of one or more branches of the trigeminal nerve. The second and third branches are most frequently involved, and the pain may dart into the cheek, the side of

the nose, the upper or lower teeth, the upper or lower lip, the chin or the tongue. Third, there usually are "trigger zones" stimulation of which will induce a paroxysm. Touching the side of the face, talking, swallowing, chewing, or placing the tongue against the upper or lower gums on the affected side will induce a paroxysm. Because of these "trigger zones" patients are frequently afraid to eat or to clean the side of the face. They present pitiful spectacles of abject misery, and one is constrained to give them relief as soon as possible.

Because of the tendency to chronicity in tic douloureux, morphine and other habit forming drugs are contraindicated. For the past fifteen years I have used the following plan in treating the condition.

1. *Diagnosis.* Before outlining treatment, the diagnosis of tic douloureux must be firmly established. All other causes of facial pain must be ruled out, especially the condition known as "atypical facial neuralgia." (See below).
2. *Medical treatment.* Some cases respond to the oral administration of phenobarbital and calcium lactate. I usually explain to my patients that there are several forms of treatment for the disease, and that I am going to start with the simplest and least expensive. Later, if it becomes necessary to modify the treatment, the patient does not feel that he is being experimented upon. He is given a capsule containing from ½ to ⅔ grain of phenobarbital and 10 grains of calcium lactate to be taken three times a day. If oral medication does not relieve the condition, I prescribe inhalations of trichlorethylene. At one time it was thought that this drug exerted a selective anesthetic action on the sensory fibers of the trigeminal nerve. However, examination with von Frey's hairs and points shows that the drug does not have any selective action on the trigeminus, but results in a general reduction of sensibility to pain. At any rate, some patients suffering from tic douloureux obtain relief from the inhalation of from 20 to 40 drops of trichlorethylene on a piece of gauze three or four times a day.
3. *Alcoholic injection.* If medical treatment as outlined above fails to relieve the paroxysms of tic douloureux, I make an alcoholic injection of the involved nerve at the site of its exit from the base of the skull. There are several approaches to the second and third divisions, but I prefer the subzygomatic approach. A special needle is used and from 3 to 10 minims of cocaine-alcohol solution are injected into the nerve trunk. The operation is extremely painful, but its effectiveness is attested to by the fact that patients return for reinjection when the effects of the last injection wear off. The anesthesia from a single injection may last from a few months to several years.
4. *Intracranial Gasserian rhizotomy.* After repeated alcoholic injections of the peripheral branches, it becomes increasingly difficult to find the nerve trunk and to produce the desired anesthesia. Then a retrogasserian neurectomy (section of the sensory root of the trigeminus) becomes necessary. This is an intracranial operation, but with modern neurosurgical technique, the operative risk is very small and the relief obtained is permanent. Before accepting patients for an intracranial operation, most neurosurgeons prefer that they have one or more alcoholic injections to accustom them to the numbness of the face which will be permanent after the sensory root of the trigeminus is severed.

Atypical Facial Neuralgia

One of the most baffling and stubborn disorders that can affect a human being is atypical facial neuralgia. Because the pain is so severe, and because little, if anything, can be done for it, the condition is a *bete noir* to neurologists. The term "atypical facial neuralgia" has come to include most of the types of pain about the face and head which do not fall into the classification of true trigeminal neuralgia. Fay[1] says, "The present concepts of this syndrome are so varied, and reports of successes and failures in treatment so numerous, that confusion reigns on all sides as to its true nature and proper solution."

The pain is deep, dull, aching, boring, and frequently throbbing. Its distribution differs from that of tic douloureux in that it is *not* confined to the areas supplied by the trigeminus. Fay has called attention to the fact that it frequently follows the distribution of the vascular tree, *i. e.*, over the malar region, up in back of the eye pointing toward the ear, extending down in back of the ear, sometimes into the neck and even into the shoulder. The existence of pain pathways in the vascular sheaths can be proved in various ways. Neurosurgeons have frequently noticed that when a craniotomy is performed on a patient under local anesthesia, there is no pain on irritation of the dura if the large blood vessels are avoided. If, however, a large vessel such as the middle meningeal artery is clamped, the patient immediately complains of pain referred deep into the eye. According to Fay's researches, there is no doubt that the sympathetic nerve fibers in the carotid sheath form a pathway for deep pain impulses from the face to the central nervous system. There is much evidence to indicate that this pathway is the one involved in atypical facial neuralgia.

Atypical facial neuralgia differs from tic douloureux in that the pain exceeds the cutaneous distribution of the trigeminus, it persists after section of that nerve, it is continuous instead of paroxysmal and there are no trigger areas. Following is a brief report of a case of atypical facial neuralgia.

Case 4. L. W., a married unemployed male, age 34, first reported to me in the neuropsychiatric outpatient department at Ancker Hospital in Saint Paul, gave family and past histories that were irrelevant to his present condition. He complained of facial pain which had come on abruptly about six months previously and which had been continuous ever since. The pain involved an area which extended from the right parietal region, down over the temporal region, across the right side of the face, and into the neck. It extended from the mouth back to

the tip of the mastoid process. Mr. W. described the pain as deep, dull and boring. With it there was hyperesthesia of the skin of the right side of the face. There were no other symptoms. The physical and neurological examinations, as well as all laboratory tests, gave normal findings. Following is a list of the various procedures that were carried out on Mr. W. elsewhere and in my clinic.

1. His teeth were removed.
2. His tongue was cauterized.
3. At some time or another all of his sinuses had been opened and drained.
4. His gall bladder had been removed.
5. He had a gastro-enterostomy.
6. His sphenopalatine ganglion had been cocainized and also injected with alcohol.
7. He had received foreign protein shock therapy.
8. He received anti-luetic treatment. (His blood and spinal fluid always had been negative for syphilis.)
9. He received deep X-ray treatments to the right side of his face. (Two different courses were given and the beard was gone on this side.)
10. An intracranial section of the sensory root of his right trigeminus had been performed.
11. He had received dozens of sedatives and analgesics but *no narcotics*.

Following each of the above procedures Mr. L.'s pain increased. He still suffers intensely and visits my clinic regularly.

This case is not unusual, and it illustrates the fact that no kind of surgery will relieve the pain of atypical facial neuralgia. Once this diagnosis is made, surgery of any kind is contra-indicated. Nevertheless, these patients continue to wander from doctor to doctor and from clinic to clinic, submitting to endless operative procedures, never obtaining relief. Harry Parker, formerly of the Mayo Clinic, referred to the condition as the "syndrome of multiple operations." The late Doctor Frazier of Philadelphia called these patients "Gasserian ghosts."

Fay thinks it is reasonably certain that in atypical facial neuralgia we are dealing with an underlying vascular pain mechanism which is distinct from the trigeminal and cervical neuralgias. One is unable to formulate any plan of treatment which will be consistently successful, and my experience has been that any form of surgical interference aggravates the condition. Every practitioner should be familiar with this disease entity in order to avoid the pitfalls into which so many physicians have fallen.

SUMMARY

No attempt has been made in this paper to formulate a classification of painful conditions involving the head and face. Four relatively common conditions have been discussed in an attempt to bring out some useful clinical points.

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Diagnosis and Treatment of Endometriosis*

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ENDOMETRIOSIS is a relatively new and very interesting disease. Since 1921 when Sampson of Albany definitely established it as a clinical entity of major importance in the gynecological field, we have rapidly added to our knowledge of its frequency, diagnosis and treatment. General knowledge has not kept pace with this rapid development.

Endometriosis is no longer just another gynecological disease. It should be of extreme interest to any physician who deals with the differential diagnosis and treatment of disease in the lower abdomen of women. Endometriosis may affect all of the structures of the female between the navel and the vulva. More recent investigation suggests that it may affect more distant organs, such as the lung. Endometriosis is not a rare or microscopic disease. Sampson reports that it may be found in from 10 to 20 per cent of all cases reporting to him for operation. Our findings are quite similar. The percentages have risen rapidly as our diagnostic procedures and microscopic examinations of excised tissue have become more accurate. In the period from 1921 to 1933 the records show that we operated upon 112 patients for endometriosis. During the past year we have operated upon 155 such patients. All of these diagnoses were confirmed by histologic study.

I would like to briefly review with you the more important contributions that have been made on this subject and give our impressions during 18 years of diagnosis and treatment in approximately 500 patients.

We still hesitate to unreservedly accept Sampson's theory that these lesions are small bits of normal viable endometrium which have been regurgitated to distant locations either through the open fallopian tubes or blood and lymph spaces. Although we have seen many instances of unquestioned mechanical transplantation, such as in abdominal scars, we are more inclined to agree with the theory that most of these misplaced islands of ectopic tissue are due to a local change in structure and function of cells which have had a common embryological origin. This change is probably caused by a dis-

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turbance in the balance of those substances, such as hormones, that have to do so definitely with cell architecture and physiological function.

Practically, we find these lesions very frequently in women during the period of their menstrual life. These lesions may be found in all of the pelvic organs, the bladder, ureters, the large and small bowel, the appendix, the navel, the skin in the inguinal canal and lymph glands, or widely scattered over the pelvic peritoneum. Recently Schwartz of St. Louis has reported two cases exhibiting periodic bleeding from the lungs which he thinks was probably due to endometriosis. Dr. H. O. Jones, of Chicago, has a similar case under observation at the present time. A periodic bleeding coincidental with the menstrual period is almost prima facie evidence that endometrial-like tissue is responsible.

These islands of widely displaced tissue are under the direct control of the menstrual mechanism. The symptoms, some of the diagnosis and most of the logic of treatment depend on a definite understanding of this phenomenon. As each menstrual period approaches, edema and cellular activity occur in these islands of tissue. Gradually increasing pain is the usual result. When the menstrual period begins, active bleeding into this edematous tissue occurs and the discomfort very often becomes acute. This shed blood is usually unable to escape and therefore the pain continues until absorption has occurred. If tension becomes too great, blood may escape into the free peritoneal cavity, bowel, bladder or through external fistulae. This old blood may carry with it small bits of tissue which in turn become implanted and produce additional lesions. This shed blood and tissue reaction causes adhesions and puckering of tissues. Acute angulation or obstruction of the bowel or ureter may result. Removal of ovarian influence may cause an abrupt cessation of symptoms.

In our experience not all of these lesions produce definite symptoms. Usually careful questioning will elicit suggestive evidence which, when combined with meticulous bimanual rectovaginal examination, will permit of a definite pre-operative diagnosis. However, we have operated upon a considerable number of patients on the basis of a suggestive history alone in the absence of palpable findings in the pelvis. Even microscopic lesions may occasionally give intense discomfort while in others widespread involvement may be almost symptomless. We have no explanation of this fact. In our opinion the most important clinical symptoms in the order of their frequency, if not importance, are as follows:

1. An acquired dysmenorrhea.
2. Backache, often extending down the thighs.
3. Dyspareunia.
4. Increased or irregular bleedings.
5. Pelvic pain on jarring, as in walking or car riding.
6. Low grade or acute bowel obstruction.
7. Frequency or pain on urination.

In its pure form the acquired dysmenorrhea is very characteristic. It may be engrafted upon a previously present essential dysmenorrhea, so that the picture is not so clean cut. Typically the discomfort begins coincidentally with the turgescence of the oncoming menstrual period, reaches its ascent at the height of blood loss and gradually subsides during the premenstrual interval. As time passes the period of discomfort lengthens until in some patients pain is constantly present. This pain is frequently described as a distended or bursting feeling and in many instances is referred down the back of the thighs. Severe lumbar backache commonly accompanies this distended bearing down discomfort and may be localized in the rectum, especially when the rectum is distended by feces or gas. This discomfort is probably produced by direct pressure on the congested areas which occur so commonly over the peritoneum of the pouch of Douglas or on the sacrouterine ligaments. By the same token the tissues in this region are directly traumatized during intercourse and the dyspareunia produced is, we think, one of the most important symptoms of endometriosis. We conduct a very careful rectovaginal search in this region for the typical puckered, bead-like nodulations in every patient we examine. An increase in size and tenderness of these nodulations can often be distinguished if the patient is examined rectovaginally during the mid-menstrual period and again just preceding the menstrual flow when turgescence of the lesions has occurred. A pre-examination cleansing enema will increase the accuracy of the palpatory findings. This dyspareunia is a common cause of frigidity.

No one has offered an explanation of the increased bleeding which occurs in patients having endometriosis. Since the disease is associated in about one-half the cases with fibromyomata uteri, the same factors may be operating that cause the bleeding so commonly found with fibroids. When one is treating fibromyomata surgically, it is imperative that associated endometrial lesions be recognized and treatment instituted lest the patient be left with residual pain. This pain is too often diagnosed as postoperative adhesions and subsequent operations are performed without relief because the basic condition causing the adhesions still goes unrecognized.

The adhesions produced by endometriosis are very dense and firm. They radiate like the spokes of a wheel from the puckered plum colored central lesion which contains old blood. These puckered, adherent, firm lesions are pathognomonic of endometriosis and every surgeon should recognize them at once by gross inspection. In private practice we find that adherent pelvic masses are much more frequently caused by endometriosis than by previous pelvic infection. In the colored race, however, endometriosis is relatively rare while pelvic infection is a very common finding.

Endometrial lesions which occur on the wall of the large or small intestine may, in their early stages, cause a painful diarrhea coincidental with the menstrual flow. As adhesions are formed gradual or acute angulation of the gut may occur, giving rise to symptoms of bowel obstruction. If the lesion of the bowel wall is widespread it is often mistaken for carcinoma and treated accordingly with greatly increased risk to the patient. Resection

of the rectosigmoid is fraught with greater danger than simple surgical or irradiation castration.

Numerous instances of perforation into the lumen of a viscus by endometriosis have been reported so that local incision often becomes extremely difficult or hazardous. We have encountered six cases which have perforated into the rectum, one which invaded the bladder wall, one in the wall of the cecum involving the vermiform appendix, and three which came through the posterior fornix into the vagina. The blood shed in these lesions at menstrual time offers a splendid culture media and we have observed several pelvic abscesses as a result.

No one has yet offered a satisfactory explanation as to why endometriosis is attended with such a high degree of sterility. About 45 per cent of our patients have been completely or relatively sterile, this in spite of open fallopian tubes and fertile males. We have felt that the same dysfunction which produced the endometriosis also was responsible for the sterility. Attempts to restore fertility even by surgical methods are not attended with satisfying results.

In spite of the probable progression and obvious risks attending expectant treatment of these young women who wish babies, we have felt justified in exposing them to pregnancy for a sufficient time if symptoms permit, before surgery is advised. Pregnancy produces the same decidual changes in this ectopic endometrial tissue as it does in the uterine mucosa. It has not been our experience that this complicates pregnancy with the exception of one case in which bleeding into the culdesac simulating inevitable abortion occurred. After sufficient time has elapsed without conception, or symptoms have become severe or in patients whose family is complete, surgical treatment should be advised.

The treatment of endometriosis as we have just indicated may occasionally be expectant. In the majority of instances, however, surgical intervention should be carried out as soon as the diagnosis is made. The method of approach in most instances is by the abdominal route. The occasional exception are those patients in whom the disease is limited to small lesions low in the culdesac, sacrouterine ligaments, or rectovaginal septum. These lesions can be attended to adequately through a posterior colpotomy incision with a minimal amount of discomfort to the patient and a shorter period of hospitalization.

Due to the widespread distribution of the lesions, a very careful inspection of the lower abdomen should be made in every patient in whom a lesion of endometriosis is found. Usually the lesions are multiple. Due to the dense adhesions, complete removal is often difficult, dangerous or impossible. Cauterization of the remainder by superficial searing with the small nasal cautery point may give complete relief. Resection of lesions, especially in the ovaries, is advisable whenever possible. Maintenance of ovarian function is greatly to be desired in these young women, although subsequent castration with X-ray may become necessary. Whenever possible, it has been our custom to leave some ovarian tissue although all of the ectopic endometrial tissue could not be removed. If sufficient symptoms persist or reappear, castration is simple, preferably by X-ray. We have saved many a young woman a premature menopause in this way. We deem as too radical the usual advice of surgical castration in most of these patients. On the other hand, if marked involvement is present and the risk of removal too great, castration acts promptly and accurately. When the ovarian stimulus is removed the lesions become quiescent and symptomless within a short time. Prophylactically, at least until the etiology is more definite, care should be taken to prevent dissemination of viable endometrial tissue during all surgical procedures. Any operation which opens the endometrial cavity may be followed by endometriosis. Deep suturing in the uterine wall may do likewise. Transplantation occurs more frequently during pregnancy and many lesions have been reported in abdominal scars following cesarean section or operations for ectopic pregnancy. It has been suggested that too forcible dilatation or curettage may also displace tissue through the open tubes. It is possible that the passage of gas or opaque media through the tubes may carry with it viable endometrial cells.

You will all see and treat many cases of endometriosis. In some of them may be written a portion of the story of their etiology. Prevention and cure depend on our coöperative observations.

Subcutaneous Liver Extract Therapy for Acne Vulgaris

Studies with Distillation and Evaporation

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A PRELIMINARY paper,[1] reporting the use of plain liver extract‡ in the treatment of acne vulgaris, indicated that this substance apparently contained a probably specific skin factor (S) which seemed to improve cases with such a syndrome. Another study was completed which endeavored to determine whether or not this liver extract would retain its ability to improve acne vulgaris when the extract was treated with heat[2]. Consequently, a portion of this material was autoclaved and another amount was boiled and administered to two separate groups of patients. It was found that the group which received the boiled liver extract seemed to exhibit more rapid improvement than did any other group treated.

Still another paper[3] was devoted to studying the material when it was boiled and also irradiated. This material was given to an additional group of acne vulgaris cases with seemingly encouraging results.

The present communication will describe some further modifications of the liver extract in the attempt to determine further the physical properties of the material with the hope that the active "S" factor can be isolated later in pure form.

It was thought that the process of distillation would split the liver extract into several separate portions. These separate fractions could be then tested in acne cases with the hope of narrowing down the amount of material used in order to approach a purer material containing the "S" factor.

Consequently, 45 cc. of the original liver extract were placed in a distillation flask, which was put on a ring stand. The flask was attached to a Friedrich's screw condenser, which was water-cooled. The material in the flask was then very slowly heated. At about 99° Fahrenheit, a clear, watery material was noted passing through the condenser. This was termed the *first fraction*. It was neutral to both blue and red litmus paper. After nearly two-thirds of the original material in the distillation flask had passed off in the first fraction, the remainder of the material in the flask began to boil markedly and a greyish gas began to pass off. A little later the *second fraction* of the distillation process was noted in the condenser. This material, like the first fraction, was collected in a beaker and examined. It was thick, oily, and heavy, and its color was dark brown. When tested with the red and the blue litmus paper, it was neutral.

Since the residue in the flask was subjected to such extreme heat and probably suffered marked decomposition, it was discarded *(third fraction)*. However, most of this residue was noted to be water-soluble. The first and second fractions were placed in separate rubber-stoppered vials and boiled for one-half hour.

Results with Administration of First Fraction

Each dose consisted of 0.4 cc. of the material, injected subcutaneously twice a week in alternate arms. No improvement was noted (Table 1).

Administration of Second Fraction

Each injection was given subcutaneously in alternate arms twice a week.

Since there appeared to be no therapeutic benefit from the use of the first fraction, and since the second fraction (and possibly the third fraction) seemed to contain the active "S" factor, it was decided to test another batch of the plain liver extract by simple evaporation. This would drive off the water, and the active principle would be present in the residue.

Hence, 60 cc. of injectible liver extract (Abbott) were placed in a simple porcelain evaporating dish on a ring stand. The extract was slowly heated by means of a Bunsen burner. Evaporation was effected until a residue of about 15 cc. remained in the evaporating dish. It is well to mention at this time that the end-point of the process could be measured rather easily. When the extract was withdrawn from the original rubber-stoppered vials and injected into the evaporating dish, a foam was formed by the procedure of shooting the extract out of the syringe and needle into the evaporating dish. As the material was heated, the foam and bubbles disappeared (with gentle shaking of the dish). The residue was fluorescent and thick, and it resembled tar. This residue was transferred to another clean rubber-capped vial and boiled for 30 minutes to insure sterility for the purpose of injection.

Residue of Evaporation *(boiled 30 minutes)*

This evaporated substance was injected into previously treated acne vulgaris patients to see if it corresponded at least clinically to the second fraction obtained from the distillation of the liver extract. Results were noted (Table 3).

After the vial containing the residue from the evaporation had stood for some days, it was noted that a whitish flaky residue appeared on the bottom of the vial. Since the findings were rather inconstant when the residue of evaporation was used, it was thought that this was produced because of the gradual settling of the flaky material on the bottom of the container. In other words, the material lost its potency as this material settled to the bottom and stuck there.

†From the Appleton Clinic, Appleton, Wisconsin.

‡Injectable liver extract (Abbott) in 5 cc. vials furnished through the courtesy of Dr. J. F. Biehn, director of clinical research, Abbott Laboratories.

TABLE 1

Patient	Age	Sex	Injection Dates	Results
B. H	20	Male	5-5-39; 5-11-39; 5-15-39; 5-22-39; 5-26-39	No improvement
H. P	19	Male	5-5-39; 5-11-39; 5-15-39; 5-19-39; 5-23-39; 5-26-39	No improvement.
D. B	17	Male	5-15-39; 5-18-39; 5-23-39	No improvement
L. S	21	Male	5-16-39; 5-18-39; 5-22-39	No improvement

TABLE 2

Patient	Age	Sex	Given Other Extract?	Injection Dates	Results
J. F.	19	Male	None	5-22-39—.1 cc.; 5-26-39—.2 cc.; 6-1-39—.2 cc.	Began clearing
B. Peot	22	Male	Given boiled liver extract previously	5-22-39—.1 cc.; 5-26-39—.2 cc 5-29-39—.2 cc 6-1-39—.2 cc.; 6-5-39—.4 cc	Marked improvement noted Has made improvement throughout this therapy
B. Pos.	17	Male	Given irradiated and boiled material previously and condition improved but has remained stationary	5-26-39—.2 cc.; 5-29-39—.2 cc. 6-1-39—.2 cc.; 6-5-39—.2 cc.; 6-15-39—.4 cc.	Lesions on shoulders have cleared. Face eruptions markedly improved
N. McK.	15	Female	Previously on irradiated and boiled extract. Improved	5-26-39—.2 cc.; 5-29-39—.2 cc. 6-2-39—.2 cc	Improvement continues
M. H.	20	Male	New case	5-26-39—.2 cc.; 5-29-39—.2 cc.; 6-1-39—.2 cc.; 6-5-39—.4 cc; 6-15-39—.4 cc.	Markedly improved Complexion improved after each treatment. Returns in a few days
M. L.	14	Female	Boiled extract Some improvement noted	5-26-39—.2 cc.; 5-29-39—.2 cc.; 6-1-39—.2 cc.; 6-5-39—.2 cc	"Lot better." Condition seems to be stationary with improvement over former condition.
D. H.	13	Male	Boiled extract. Slightly improved	5-26-39—.2 cc.; 5-29-39—.2 cc.; 6-2-39—.4 cc.; 6-5-39—.4 cc. 6-8-39—.4 cc.; 6-11-39—.4 cc.; 6-15-39—.4 cc.	Better. Improving very slowly
H. P.	21	Male	New case	5-29-39—.2 cc.; 6-1-39—.2 cc. 6-5-39—.4 cc.	Slightly improved
E. T.	18	Male	New case	5-29-39—.2 cc.; 6-5-39—.2 cc.	Not much improvement. Returned to home out of the city
B. H.	19	Male	New case	5-29-39—.2 cc.; 6-1-39—.2 cc.	No improvement
L. S.	21	Male	New case	5-29-39—.2 cc.; 6-2-39—.2 cc.; 6-5-39—.2 cc.	Slight improvement noted
D. B.	17	Male	New case	5-29-39—.2 cc.; 6-1-39—.2 cc.; 6-8-39—.2 cc.	Improved quite a bit
B. Van H.	17	Male	New case	6-1-39—.2 cc.; 6-5-39—.4 cc.; 6-8-39—.4 cc.	Markedly improved

In order that this could be tested, the supernatant fluid was drawn off and placed in a separate clean vial. The scummy material remaining at the bottom of the vial was washed with 10 cc. of distilled water, shaken thoroughly and reboiled. Then this solution was administered to patients with acne vulgaris. The results are given in Table 4.

Discussion

It is quite obvious that, at best, these observations can be regarded as mere indications of which preparations seem to be the most potent in regard to the "S" factor. From these limited experiences, it appears that the evaporated residue, which collects on standing on the bottom of the vial, may be the material which is responsible for the clinical improvement noted in these cases.

It would have been more experimentally correct to have used entirely new cases with each new preparation which was being employed clinically. However, such goodly numbers of acne vulgaris cases are, unfortunately, not within my call. Hence, it was necessary to make the best of what cases were available. I do not believe that the use of previous materials had much to do with the results which were noted when new preparations were used or administered to these patients. Improvement would come about if the injection substance were fortified with more "S" factor than that which was contained in the preparations previously employed.

Therapeutic Points for the Various Forms of Modified Liver Extract

Since the publication of previous research on acne vulgaris treated with unboiled and boiled liver extract, I have found several points which should be brought to the attention of those who are employing or plan to use such methods. Perhaps the best way to present these observations is to put them in the form of terse or concise statements. Many physicians have written for more specific information with regard to the routine of this therapy, which they wish to employ with their own cases.

TABLE 3

Patient	Injection Dates, Dosage, and Results							
J. F.	6-5-39—.2 cc.; 6-12-39—.4 cc. Face smooth. Improvement marked	6-15-39—.4 cc.	Markedly better	6-22-39—.4 cc.	Clearing nicely			
M. L.	6-8-39—.2 cc.; 6-12-39—.4 cc. Better	6-15-39—.4 cc. 6-22-39—.4 cc.	Improving Doing well	6-29-39—.4 cc.; No change	7-3-39—.4 cc.			
B. H.	6-6-39—.2 cc.; 6-9-39—.4 cc. Markedly better	Returned home from town						
H. P.	6-9-39—.2 cc.; 6-12-39—.4 cc. Better	6-15-39—.4 cc.	Improving	6-28-39—.4 cc.	Improvement continues			
J. Z.	6-12-39—.2 cc.; 6-15-39—.4 cc.; 6-19-39—.4 cc. Slight improvement	6-22-39—.4 cc.	Marked improvement	6-26-39—.4 cc.	Improving rapidly			
B. Van H.	6-12-39—.2 cc.; 6-16-39—.4 cc. Back clearing 6-26-39—.4 cc.; 6-29-39—.4 cc. No change 7-10-39—.4 cc. No change	6-19-39—.4 cc. Face improving rapidly 7-3-39—.4 cc. No change		6-22-39—.4 cc. 7-8-39—.4 cc. Same today	Improving gradually			
D. H.	6-15-39—.2 cc.; 6-19-39—.4 cc.; 6-29-39—.4 cc.	No change		7-3-39—.4 cc.	Slight improvement			
M. H.	6-15-39—.2 cc.; 6-20-39—.4 cc.; 7-1-39—.4 cc.	No better						
B. Para.	6-29-39—.2 cc.; 7-1-39—.4 cc.; 7-3-39—.4 cc.	Much worse since using this preparation						

TABLE 4

Patient	Injection Dates, Dosage, and Results							
J. F.	6-26-39—.2 cc.; 6-29-39—.4 cc. Clearing a bit	7-3-39—.4 cc. Gradual improvement		7-6-39—.4 cc. Improvement continues		7-10-39—.4 cc. Better		
J. Z.	6-26-39—.2 cc.; 6-29-39—.4 cc.	Not much change	7-3-39—.4 cc.	Marked improvement				
W. S.	6-28-39—.2 cc.; 6-30-39—.4 cc.	Marked improvement	7-3-39—.4 cc.	Face nearly clear				
H. P.	6-28-39—.2 cc.; 7-5-39—.4 cc.	No change	7-10-39—.4 cc.	Marked improvement				
M. H.	6-28-39—.2 cc.; 7-6-39—.4 cc.	Much better						
B. Para.	7-1-39—.4 cc.; 7-3-39—.4 cc. Improved	7-5-39—.4 cc. Improvement continues		7-10-39—.4 cc.	Face clear			

The following statements apply only to the unboiled, boiled, or irradiated preparations of the liver extract which have been described in several previous publications.[1,2,3]

1. Patients should be cautioned never to squeeze their eruptions, since such a practice may leave scars; nor should physicians incise these indurated areas for the drainage of pus.
2. If comedones must be removed, use a comedone extractor (which costs about ten cents) and clean it with alcohol before and after each procedure.
3. If a patient squeezes or accidentally breaks a pustule, it should be treated by touching it with alcohol or some other antiseptic and allowed to dry without further treatment.
4. Each case varies in respect to the dosage which should be employed. Some patients will need more material, administered twice a week, than others. In other words, 0.4 cc. of the extract may not be enough to bring about improvement even though the case be amenable to this form of therapy.

   Some individuals seem to require more of this substance than others. This appears to correspond to a vitamin-like response. All of the published research was done with the *minimum dose* necessary to bring about clinical improvement. One patient has received 1 cc. of the extract injected twice a week. This case did not respond to therapy until such a dosage was reached.
5. There is such a thing as a hypersensitivity to liver extract. Therefore, before treatment with this material is begun, it is well to try a very small dose in order to test the sensitivity of the patient to liver extract.
6. If cases happen to be plethoric, it is better to check their hemoglobin and especially their red blood cell counts periodically. Do not allow this count to rise above the normal.
7. This procedure, with the use of the plain or any

other preparation of the liver extract, is wholly experimental at this time. It is not intended to be a cure-all. There have been failures with this method just as there have been cases which have shown improvement.

In experimental work, such as this, it is rather important that the liver extract, which is prepared by the investigator, be tried clinically on a reliable and trustworthy volunteer. If any untoward reactions are encountered, such can be remedied before further material is injected in dispensary patients and unpleasant experiences develop. Therefore, in order to guard against possible medico-legal complications, I make a practice to have these materials, which I make, tested on myself before giving them to others. In this manner, I am reasonably sure that, if any difficulty is met with the administration of these preparations, I will be the first to know of such an occurrence. An associate administers each new preparation to me; hence, I am fully aware of the exact nature of the material which is to be used in other cases.

SUMMARY

Injectable liver extract was distilled and three separate fractions were obtained therefrom. The second fraction, when administered subcutaneously, seemed to be the most clinically potent in improving acne vulgaris. The third fraction might have been potent also, but this was not tested because of the possibility of obtaining untoward and dangerous reactions from this third fraction, due to the intense boiling and the gaseous deterioration which was noted.

Another amount of the original liver extract was subjected to evaporation. Over two-thirds of the amount of the material evaporated. The residue, a tarry material, was placed in a separate vial, boiled, and allowed to stand. As the flaky material settled out of the remaining solution, the injection material seemed to lose its potency to improve cases of acne vulgaris.

The supernatant fluid was removed and placed in another vial; and the precipitated flaky material, which remained on the bottom of the vial, was washed and agitated thoroughly with 10 cc. of sterile, distilled water. When this solution was given to patients with acne vulgaris, they seemed to improve clinically.

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Pneumoperitoneum for the Treatment of Pulmonary Tuberculosis

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THE first case in which I had the opportunity to observe the mechanical effect of a combined phrenic nerve block and pneumoperitoneum occurred in my practice in 1931. The details of this observation were reported in previous publications.[1,2] Since that time, a systematic study has been carried out to ascertain the technical feasibility and the therapeutic value of this procedure. The animal experiments of Overholt[3] were very helpful in this respect. He found that in every animal, following the injection of air into the peritoneal cavity, the diaphragm was elevated and its motion diminished. It was noted that the injection of from 10 to 100 cc. of air per kg. of body weight caused approximately a 50 per cent decrease in the amplitude of diaphragmatic excursions.

The reasoning was not unwarranted that artificial pneumoperitoneum may induce similar effect in human beings and thus, this procedure might serve as an additional aid in the treatment of pulmonary tuberculosis. All standard measures of today aim at the relaxation and relative immobilization of the diseased lung. There are numerous reports in the literature that prove the value of the rise of the diaphragm that follows surgical paralysis of the phrenic nerve. It was logical to assume, therefore, that if one were able to establish a sufficient and sustained elevation of the diaphragm, artificial pneumoperitoneum would produce the same or even better results than phrenic nerve block. The possibility of better results was thought of because an effective pneumoperitoneum causes a rise of *both* domes of the diaphragm simultaneously, and because one is able to manoeuvre the air in the peritoneal cavity by having the patient lie on the "good" side, if we are dealing with a unilateral disease, and thus produce a *higher* elevation of the diaphragm than by a phrenic nerve operation. Subsequent fluoroscopic and roentgenographic observations proved the correctness of this conception.

The establishment of an effective pneumoperitoneum should be attained by injecting gradually increased amounts of air. The sudden injection of large amounts would cause severe pain, marked abdominal tightness,

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and discomfort. At the time of the first treatment 500 to 800 cc. of air are given. The amount depends upon the size of the abdominal cavity, the tonus of the muscles of the anterior abdominal wall and the sensitiveness of the patient. A fluoroscopic examination shows only slight rise of the diaphragm after the first injection. Subsequent injections, however, produce a cumulative effect and a substantial elevation of the diaphragm. As an illustration, one of our cases can be quoted. T. P. (hospital No. 10407) received 600 cc. of air at the time of his first treatment. The level of the diaphragm after treatment was determined by measuring the apex-base distance on a roentgenogram. When it was compared with measurements taken before treatment, it was noted that there was only a 0.6 cm. rise on the right side, and no rise at all on the left side at maximum inspiration, while at maximum expiration the rise was only 1 cm. on the right side, and 1.8 cm. on the left side. Roentgenograms were taken on the same individual when the treatment was well established, and comparative measurements showed a rise of the diaphragm that amounted to 7.4 cm. on the right side, and to 3.5 cm. on the left side at maximum inspiration, while at maximum expiration the rise was 7.3 cm. on the right side and 4.1 cm. on the left side. The significance of these figures is better appreciated if one compares them with measurements of the level of the diaphragm before and after surgical paralysis of the phrenic nerve. It was pointed out in a previous study[4] that in thirty unselected cases the *maximum* postphrenic rise of the diaphragm was 6.3 cm. at maximum inspiration and 4.5 cm. at maximum expiration, the *average* being 2.5 cm. on inspiration and 1.5 cm. on expiration.

The air injected into the peritoneal cavity is only partly effective as far as the upward displacement of the diaphragm is concerned. It is well to keep in mind that the width of the air pocket that is easily demonstrable roentgenologically *is not equivalent* to the elevation of the diaphragm. *The major part of the air pocket signifies an artificial visceroptosis.*

The intraperitoneal pressure is atmospheric in the lower abdomen, and negative in the subdiaphragmatic region. Small amounts of air cause an initial rise that gradually returns to atmospheric pressure. Periodically-repeated injections of moderate quantities of air produce a positive pressure that may persist for a prolonged period of time. The increase in the intraperitoneal pressure is dependent upon the tonicity and integrity of the abdominal wall and the diaphragm, the type of respiration (thoracic or abdominal), the general condition of the patient, and the amount of injected air. There is ample evidence that a satisfactory elevation of the diaphragm can be secured by moderate amounts of air: 1000 to 1500 cc. I do not recommend larger injections than these. First, because larger injections cause unnecessary and unjustified distress to the patient, and secondly, because they cause a *dilatation of the lower part of the thoracic cage with a subsequent lowering of the level of the diaphragm, instead of elevating it, and thus the procedure would defeat its own purpose.*

The fundamental therapeutic effect of artificial pneumoperitoneum are: (1) a decreased intrapleural pressure, and (2) relaxation of the lung. These two factors are mainly responsible for the benefits of this treatment. A relaxation of the pulmonary tissue is likely to be followed by lymph stasis and by a passive relative hyperemia. The cause of the lymph stasis is that the relaxed tissues block the way of the free flow of lymph, and also that the driving force of the relaxed tissues is less efficacious than that of the normal lung. The cause of the passive hyperemia is that when the alveoli collapse in the relaxed lung the venous blood carried to the capillaries through the pulmonary artery is incompletely oxygenated. Lymphstasis and passive congestion are as conducive to fibrosis in the lungs as in other organs, (cirrhosis of the liver). Besides this, passive congestion may be of importance because of the fact that high concentrations of carbon dioxide inhibit the growth of tubercle bacilli. It is worth while to recall the postulate that Rokitansky formulated in 1844, namely, that heart disease with a consequent engorgement of the lungs is preventive of tuberculosis in the same organ.

In my first case, pneumoperitoneum stopped an otherwise uncontrollable pulmonary hemorrhage. The basis of this particular effect is the same as in artificial pneumothorax: the closure of the ruptured vessel wall by releasing it from its stretched-out state. In certain respects, artificial pneumoperitoneum is superior to artificial pneumothorax. First, it is practically without technical dangers, such as air embolism; secondly, by causing a relaxation, instead of a hyperfunction, of the "good" lung, it protects the lung from the spread of the disease; and thirdly, because of the absence of mediastinal shift that may cause respiratory and circulatory embarrassment in artificial pneumothorax. Pneumoperitoneum has certain advantages over phrenic nerve block, particularly over exeresis, (1) as it was mentioned before, because of the possibility of shifting large amounts of air to underneath the diaphragm on the diseased side; (2) because the injected air serves as a resilient support of the diaphragm, that increases the efficiency of expectoration, while following phrenic nerve-block the force of expectoration is diminished on the operated side; (3) because it is a reversible operation that can be discontinued at any time. The most outstanding accomplishments of pneumoperitoneum are the reduction in size and complete obliteration of cavities. I have seen the closure of rather large-size cavities in a relatively short time. Apical as well as basal cavities may respond favorably, provided the wall of the cavity is not too thick or rigid, and the mechanical status of the lung, upper thorax and the diaphragm does not counteract the craniocaudal relaxing influence of pneumoperitoneum.

Technique

Pneumoperitoneum is given with filtered air, like artificial pneumothorax. The injections are done between breakfast and lunch. Enemas or cathartics are not necessary. The bladder must be emptied directly before treat-

ment. The patient is brought to the operating room on a cart or in a wheel chair. I have administered artificial pneumoperitoneum to patients who were in relatively good physical condition, and were able to walk back to a separate building after treatment. An adequate dose of codeine is given one hour before injection to patients with an excessive cough. The patient is placed on a slanted operating table (head up) in the supine position. This facilitates the passage of the injected air to underneath the right dome of the diaphragm, where it becomes easily detectable by a tympanitic percussion note over the previously dull area of the liver. The operator should percuss this region by one hand before and during the first phases of injection. The best site for injection is three fingers' breadth below and to the left of the umbilicus. One per cent novocaine is used for infiltration of the abdominal wall, particular attention being given to the peritoneum. A small skin incision is made to aid the smooth insertion of the needle. I prefer to use a three-inch-long Floyd-Robinson needle. It is better than an ordinary needle, (1) because its handle-like head ensures a good grasp and an easy handling; it helps in holding the needle back by a firm grip, while it is forced through the layers of the abdominal wall, and thus one is able to avoid a sudden penetration and intestinal puncture; (2) because its obturator prevents its being obstructed by blood clots or tissue particles; (3) because its side tube permits the attachment of a syringe, that contains sterile saline solution, for the purpose of testing out whether or not the point of the needle reached the peritoneal cavity.

The manometer of the standard pneumothorax machine is of little aid at the time of the first injection. The intra-abdominal pressure being neutral (atmospheric) below the umbilicus under usual circumstances, it does not show rise of the fluid in either leg, and respiratory oscillations are absent. The following indicators are of value as to when the tip of the needle has reached the free peritoneal space: (1) the disappearance of resistance in front of the needle as it is forced through the abdominal wall; (2) the free flow of novocaine from a syringe, attached to the side tube, without the use of force; (3) cause the patient to take a deep breath and to make an expiratory effort against the closed glottis; manometric change may become apparent during one of the respiratory phases. The manometer is of great help on repeated injections. It indicates an oscillating or non-oscillating positive pressure immediately, or shows a positive pressure when the patient bears down with his diaphragm, or when he exhales after such an effort. Moderate pressure upon the abdominal wall by one hand of the operator may cause a positive pressure on the manometer.

If the point of the needle reaches the peritoneal cavity and air is injected, it will flow readily through the needle. The operator should watch the fluid level in the "second" bottle of the pneumothorax apparatus. It is strongly recommended that at every initial treatment a manometer reading be taken after the injection of 10 to 15 cc. of air. If the point of the needle lies in the peritoneal cavity, the manometer will not indicate change in pressure. If the point of the needle lies in the tissues of the abdominal wall, the flow of air will be very slow, and the manometer will register a non-oscillating positive pressure. If such is the case, the needle should be forced deeper, or entirely withdrawn and newly reinserted. The direction of the needle should be perpendicular. I have encountered several cases of adhesive tuberculous peritonitis in whom it was impossible to establish satisfactory pneumoperitoneum because of the presence of extensive adhesions.

Following the injection of about 300 cc. of air, the patient usually indicates a sensation of fullness or tightness at the level of the diaphragm or in one or both shoulders. If the injections are given slowly, this discomfort is only slight. It is greater if larger amounts of air are injected. It must be kept in mind that the subjective feeling of the patient is a better guide as to the sufficiency of injected air than the manometer. Furthermore, it is important to remember that the shoulder pain and lower thoracic tightness are more marked when the patient is in the upright position. In rare instances, it may happen that, for the relief of shoulder pain, it will be necessary to elevate the foot of the patient's bed for the purpose of removing the air from underneath the diaphragm and force it to the pelvic area. As a rule, most patients readily accommodate themselves to the increased intraperitoneal pressure and are able to carry on their daily routine as before the treatment.

I instruct all my pneumoperitoneum patients to spend as much time as possible in the semi-reclining position. This insures the optimum elevation of the diaphragm that is indispensable for its curative effect. Patients who have a unilateral pulmonary tuberculosis have been advised to take up postural rest. This is carried out just the opposite way to what is done in untreated cases, namely, the patient is lying on his *"good"* side. By this manoeuvre one is able to force all the injected air to underneath the diaphragm on the diseased side. It must be emphasized in this connection that postural drainage must precede postural rest in every instance. This procedure must be conscientiously ordered by the physician, carried out by the patient and supervised by the nurse. Omitting postural drainage prior to postural rest may result in an unnecessary intracanalicular spread of the disease.

The injections are given once a week. When a satisfactory elevation of the diaphragm has been established, as noted from the fluoroscopic observations, from the subjective feeling of the patient, and from objective findings, the injections may be given at two weeks' intervals. I have found the use of an ordinary abdominal binder of great assistance in my practice. My fluoroscopic studies convinced me that by this measure it is possible to elevate the diaphragm by 3 to 5 cm. in addition to the level already attained by pneumoperitoneum. The use of a snugly-fitting abdominal binder is of value also at the end of pneumoperitoneum treatment. It

helps to maintain the elevated position of the diaphragm, and prevents the sudden drop of the diaphragm when the injections are discontinued. It is a simple appliance of truly great merit because it forestalls a sudden breakdown of an apparently healed tuberculous process, a tragic event not infrequently seen postpartum in tuberculous women.

Indications for artificial pneumoperitoneum in pulmonary tuberculosis:

1. When artificial pneumothorax is unsuccessful because of the presence of adhesions. 2. When artificial pneumothorax does not cause a sufficient relaxation of the basal portion of the lung. 3. When intestinal tuberculosis does not improve in spite of the lung being kept under control by an adequate pneumothorax. 4. Bilateral pulmonary tuberculosis which is not eligible for bilateral pneumothorax because of the extent of the disease, or because of the general condition of the patient. 5. Bilateral tuberculosis when pneumothorax can be established on one side only. 6. When the rise of the diaphragm following phrenic nerve surgery is unsatisfactory. 7. In addition to a satisfactory phrenic nerve-block, when cavities do not close in due time, or when the patient is suffering from intestinal tuberculosis. 8. In patients in whom other forms of mechanical measures were indicated, but who were not willing to accept them.

Clinical Impressions

During my six years' experience with the use of artificial pneumoperitoneum for the treatment of pulmonary tuberculosis, I found that its benefits to the patient are manifold. Patients state, with only few exceptions, that the severiy of their cough diminished, and the amount of the expectorated sputum greatly increased shortly after the institution of the treatment. The elimination of inflammatory products from the bronchial tract, together with a diminution of the tear and wear of coughing are in themselves conducive to healing. The gradual disappearance of the toxic symptoms was noted in several of my cases. Patients who were thought not to be eligible for any type of mechanical treatment because of the advanced stage of their tuberculosis, seemed to take a new lease on life; they became hopeful, confident and optimistic when having regained their strength they were advanced from strict bed rest to increased exercise and other privileges. In some of my patients the relief from dyspnea was quite obvious. This can be explained (1) by the improved drainage of the lungs, (2) by the opening-up of previously atelectatic areas, and (3) by the support of the emphysematous basal portions of the lung by the injected air. The roentgenological follow-up work corroborated the symptomatic improvement and the lessening of the physical findings in several instances. It is rather impressive to see how some wide spread caseous lesions respond to pneumoperitoneum. Simultaneous clearing in both lungs was noticeable in some patients, together with the obliteration of good sized cavities. The incidental effect of pneumoperitoneum upon the so-often complicating intestinal tuberculosis is of no small significance in treating patients, most of whom had a far advanced tuberculosis. At the time when I reported my first 44 cases of tuberculous enterocolitis treated by pneumoperitoneum,[5] attention was called to the fact that symptomatic relief resulted in 70.4 per cent of the cases. It is reasonable to believe that, when treating pulmonary tuberculosis by pneumoperitoneum, the incidental rehabilitation of the subcompetent tuberculous intestines by restoring their normal motility and digestive function adds substantially to the beneficial results of this method of treatment.

Naturally, disappointing failures are not infrequent. When dealing, however, with a group of patients many of whom have a grave prognosis, or are classified as so-called maximum benefit cases at the beginning of the treatment, one must be modest in one's anticipations.

Conclusion

1. Artificial pneumoperitoneum is a simple and safe procedure.

2. The amount of injected air should be adapted to the individual case.

3. Proper evaluation of the subjective feeling of the patient, and a close roentgenological and laboratory control of the case, are essential.

4. Artificial pneumoperitoneum can be used as an independent operation when the patient is either not eligible for other forms of mechanical treatment of the lung, or is not willing to accept them.

5. It should be used as an adjunct in cases of unsatisfactory artificial pneumothorax or ineffective phrenic nerve block.

6. My experience with artificial pneumoperitoneum has been rather encouraging during the past six years. Satisfactory subjective and objective improvements have been accomplished by this method in some of my otherwise intractable cases of pulmonary tuberculosis. Still, I believe that only a more extensive clinical application may determine its future place in our therapeutic armamentarium.

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Accidental Gunshot Wound of Head with Recovery

A Case Report

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NOT infrequently we pick up our daily newspapers and read of some person accidentally shooting a friend while hunting for any game from rabbits to deer. Usually the end result is fatal but at times the injured person survives to boast of the experience. We wish to report one of the latter cases, that of an individual who not only survived but later attended college and presented an unusual and striking roentgenographic study of the skull and brain.

A white male student (K. F. B.—97955), 19 years old, presented himself to us in the outpatient department of the Student Health Service at the University of Wisconsin in September 1937. This student was enrolled in the engineering course and had noted a moderate degree of difficulty in doing the fine work required in making the lettering plates for the course. Historically he stated that in 1934 a friend of his and the patient had been on a blackbird hunting trip. The partner had mistaken the patient's hat for a blackbird and shot him through the head with a .22 caliber rifle bullet. The student immediately developed a right sided hemiplegia and an aphasia, but did not completely lose consciousness, and he was taken to his home.

The paralysis of the right leg began to clear within a few hours following the accident and the leg began to respond to stimuli. Three weeks elapsed before the right arm showed any evidence of recovery of function but in due course of time the movements of the arm had been fairly well re-established. Two and one-half months after the accident, the attending physician removed a part of the bullet from the left side of the skull (the point of entry of the bullet) under local anesthesia. More improvement in the right wrist and hand followed this surgical procedure. The aphasia cleared in about one week following the accident.

Examination in September 1937 revealed a moderate degree of motor paralysis of the right lower face and decreased function of the right trapezius and sternocleidomastoid muscles. There was inability to voluntarily extend the right forearm at the elbow completely and inability to dorsiflex the right wrist. Slight atrophy of the thenar and hypothenar eminences was noted on the same side. The strength of this hand was much diminished but the right upper arm was about as strong as the left. Writing motions of the right hand were unsteady, slow and irregular but no tremor was present. The sensory findings included some diminution of reaction to pinprick on the volar surfaces of the right thumb and index finger. Definite adiadokokinesis was noted on right and the biceps, triceps, and radial reflexes were exaggerated as compared to left. No pathological reflexes were noted. No changes in the lower extremities were recorded. The impression was partial right sided hemiplegia and hemiparesis from injury to left motor cortex.

The surgeons were consulted concerning the removal of the remaining portion of the bullet but it was their opinion that it might endanger the life of the patient by activating a latent infectious process, so no surgical procedure was instituted. Physical therapy (electrical stimulation) and gymnasium exercises and swimming were tried. A small degree of improvement in strength was noted but in the four-month period following the institution of this therapy no great progress was made. The student transferred to another school at the end of the semester.

The X-ray studies reveal the point of entry of the bullet in the left temporoparietal region and its final resting place on the opposite side of the head. A few flecks of metal trace out its path through the brain substance. It is astonishing that a bullet entering in this manner and carrying particles of dirt, hair, bone and cloth did not do much more damage than was done, and the only residuals were a few limited motor and sensory changes which did not greatly cripple or handicap this student. He had re-educated himself to use his left hand for most purposes and no gross evidence of damage was obvious to the casual observer. However, he did continue to use the right hand and fingers for fine work, such as lettering, for he was unable to educate his left hand to do this detailed type of work. Except for this limitation there was little if any interference with his regular pursuits.

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Fig. 1. Point of entry of the bullet on the left side of the head and the fragments of metal within the cranial cavity along the course of the bullet. The body of the object is distinctly seen in the right upper portion of the cranial cavity.

Fig. 2. Body of the bullet and the skull changes as well as particles of lead surrounding the point of entry (on the opposite side) and along the course followed by the bullet.

Epilepsy Among College Students*

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DEVELOPMENT in our growing understanding of epilepsy, or the convulsive state, has served to direct increasing attention to its social and personal significance and relations, especially with reference to the non-institutional type of patient. With this in mind, it is felt that a survey of the incidence and implications of epilepsy, so termed, as it occurs in the college or university setting may be of interest, particularly since apparently no discussion of this aspect has as yet found its way into the literature.

The present report is concerned with students at the University of Michigan coming to the attention of the University Health Service and its Mental Hygiene unit over a nine year period (1930-1939), because of paroxysmal attacks of unconsciousness classifiable as grand and petit mal seizures. Particular effort was made to exclude all cases of simple syncope, hysterical reactions, or other unconscious states not possessing the characteristics of epileptic attacks. Cases with history of convulsions in infancy or early childhood which did not continue or recur up to the college age—incidentally averaging some twenty per year—were also excluded.

The total enrollment at the University of Michigan during the nine year period was 118,532, with a yearly average of 13,170. During this time, a total of 70 students came to attention who were definitely known to be subject to epileptic attacks as described above. Of this number 44 (62.9 per cent) had attacks before coming to the University, and the remaining 26 (37.1 per cent) had their first seizures subsequent to entrance. Thus, roughly, for every five epileptic students in college, two seem to have developed the condition while in residence. Grand mal, with or without accompanying petit mal seizures, occurred in 64 cases (91.4 per cent) and petit mal or narcoleptic attacks only, in 6 cases (8.6 per cent). Respecting sex incidence, 50 (71.4 per cent) were men and 20 (28.6 per cent) were women. This constitutes a ratio of 2.50 for men to 1 for women which is slightly higher than for the University as a whole during the same period (2.30 to 1), and double the ratio of 1.28 to 1 reported for the incidence of psychoses occurring among students at the same institution over a seven year period (1930-1937).[1]

From our data, the actual incidence of epileptic disorder for the student population is 0.06 per cent. While, of course, our group is too small to serve as a basis for at all absolute conclusions, it is of interest to note that this figure is identical with that given by Patry[2] in a study of epilepsy among New York public school children. Further, this percentage undoubtedly represents a minimal value for the college group, since there is little question that some cases never came to attention, either because attacks were unreported or unrecognized (true particularly of nocturnal seizures), or because treatment by outside physicians effectively prevented attacks while the student was attending the University. In view of the small size of this series as well as its limited age range, the incidence as determined for the student body is, of course, not directly comparable to the general incidence of epilepsy, but it may be worthy of mention that it represents less than one-eighth of that (0.5 per cent) estimated by Lennox[3] for the adult population at large.

Meriting comment, too, is the fact that of 44 students who had frank attacks before coming to the University, in 24 there was history of either "epilepsy," "convulsions," or "fainting spells" on their entrance physical examination forms. Twelve men and seven women who made no mention of the attacks at the time of entrance, freely admitted attacks and previous therapy after the first seizure in college had occurred. In nine patients there was report of previous infantile and childhood convulsions.

As to method of referral, 46 students came to the attention of Health Service physicians after the first attack on the campus had occurred, 18 came for examination and treatment on their own initiative, and only 6 were referred by parents, friends, relatives or home physicians. The small number of referrals from these latter sources is of especial interest. Increased understanding and coöperation on the part of such persons is much to be desired and should aid greatly with respect to optimal procedure, not only regarding the question of admission but also, if admission seems advisable, with reference to proper planning and treatment during the college period.

As indicated in table I, the total number of new and continued cases in attendance each year during the nine year span varied from 10 to 36, with an average of 21, or 0.16 per cent of the average annual enrollment. Although the number of new cases each year is smaller, the total number of students with epilepsy in residence on the whole closely approximated the average number of new and old psychotic cases (0.18 per cent).[1] This would seem largely explainable through the fact that the epileptic syndrome, marked by brief discrete attacks, would be less apt to interfere with the academic situation than disorders of the sweeping quality characteristic of the psychoses. So far as can be determined from available records, all but four of the total series had characteristic attacks sometime during their stay in the University, and during each school year an average of 13 students had one or more attacks, occurring for the

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most part on the campus or its environs. Among 60 of the group who had one or more grand mal convulsions, the record indicates that there was an average of at least 21 such seizures during each of the nine years included in this survey.

TABLE I.
Number Annually Enrolled Who Were Subject to Seizures

	Number in Residence	Number Who Had Attacks
1930-31*	10	9
1931-32	13	10
1932-33	17	13
1933-34	20	7
1934-35	19	9
1935-36	26	13
1936-37	36	24
1937-38	22	13
1938-39	21	15
1939-40**	4	3

*Not including Summer Session.
**Including only Summer Session

The ages at which seizures began ranged from birth to 33, the average onset for the whole series being 17.1 years and the median 17.0. As is shown in table II, there was no significant difference in the time of onset between men and women. The average age of onset for the six cases who had petit mal attacks only was 18.6 years. In the aggregate, students who had seizures before coming to the University developed them four to six years before the group whose attacks occurred after enrollment. The former group includes two in whom seizures had been present since birth, one each with onset at the ages of 5, 6, 7, and 9; in the balance the onset was after the tenth year. In this relation, in spite of the smallness of our series, it may be deserving of comment that whereas for non-deteriorated epileptics in general the age of onset was found to be under 10 years in 25.6 per cent,[4] this was the case with the college group in but 11.3 per cent.

TABLE II.
Age of Onset of Seizures

	Range	Average	Median
50 males	1-26	16.6	17.0
20 females	10-33	18.5	17.0
44 with history of attacks before enrollment	1-33	14.6	16.0
26 who developed attacks after enrollment	17-32	21.3	20.0
70 cases (total number)	1-33	17.1	17.0

The period elapsing before attacks were noted after enrollment in the University is shown in table III. From this it is evident that in the greater number of both new and old cases (over 60 per cent of the total number) the attacks came to medical attention during the first year of residence. The group having no attacks prior to enrollment is divided equally between the first and subsequent years up to the sixth. Three known active cases who had been under treatment up to the time of entrance and who continued under medication had no attacks while in residence. Another, not previously under medication, remained free of seizures so far as is known during the two years he was enrolled.

As regards enrollment in the various units of the University, 38 students, the largest number, were from the College of Literature, Science and Arts, and 13 from the College of Engineering. Seven were registered in the Graduate School, four in Law, two in Music and one each in Architecture, Education, Medicine, Forestry, Library Science and Dental Hygiene.

TABLE III.
Time When First Attack Occurred in the University

	Patients with History of Previous Attacks	New Cases
Within one month	15	2
Within two months	7	0
Within three months	5	2
Within four months	1	3
During second semester	5	6
During second year	4	9
During third year	3	0
During fourth year	0	2
During fifth year	0	1
During sixth year	0	1
No attacks while in residence	4	0

The etiological factors so far as these could be ascertained by complete physical, neurological and roentgenological studies, are shown in table IV. As might be anticipated, the group classified as "idiopathic," i. e., those in whom no significant causal factors other than constitutional predisposition could be put forward, made up over 70 per cent. Organic factors such as trauma, birth injury, endocrinopathy, congenital defects, encephalitis, and brain tumor were presumably of etiologic significance in the remaining 26 per cent of the cases. While the data is admittedly insufficient for final conclusions, the hereditary factor is not prominent in this group of cases. Six students gave a history of seizures among near and distant relatives, one having an uncle and two siblings with convulsions. In the family histories of the other five, attacks occurred in the case of one father, one mother, two siblings, and one aunt.

TABLE IV.
Etiological Factors (Exclusive of Heredity)

	No. of Cases	Per Cent
No cause determined ("Idiopathic")	52	74.3
Onset following severe head trauma	6	8.5
Possible endocrine relationship	4	5.7
Related to toxic states (alcohol)	3	4.3
Residual of infections or inflammations of C. N. S.	2	2.9
Associated with congenital organic defects of C. N. S.	2	2.9
Related to brain tumor (meningioma, operated)	1	1.4

With regard to precipitating factors of individual attacks, in a significant number of cases (at least 15) there seemed to be a fairly definite association with fatigue, irregular habits, overindulgence in alcohol, and special situational stresses, academic and otherwise.

As pointed out by Patry,[5] the therapeutic approach in epilepsy must be directed toward a constructive reintegration of the total personality, which includes competent management of the psychoaffective aspect as well as the specific clinical features related to the attacks as such. The students comprising this series presented a wide variety of personality and adjustment problems and handicaps, and treatment in each case was necessarily highly individualized. Incidentally, all but five of the group were interviewed by members of the Mental Hygiene unit. Also, it may be of interest at this point that of each hundred cases seen by this unit, approximately one was a student with epilepsy.

As will be seen in table V, contacts ranged from cases requiring one or only a few consultations to those at the other extreme with over fifty interviews, the average for the series for the total period being a little over ten per patient.

TABLE V.
Interviews in Mental Hygiene Unit

	No. of Cases	No. of Interviews
No interviews	5	0
One interview	10	10
Two interviews	12	24
Three to five interviews	9	37
Six to ten interviews	15	117
Eleven to twenty interviews	11	163
Twenty-one to fifty interviews	5	150
Over fifty interviews	3	229

The situational and personality problems presented by the epileptic students do not differ widely from those found in the general run of college students seen by the Mental Hygiene unit.[6] For the group as a whole, however, there appears to be a somewhat heavier weighting with respect to such characteristics as egocentricity, instability, over-impulsiveness, lack of regularity, and poor self-discipline. Also, the number with unsatisfactory academic achievement as a factor is somewhat higher. Feelings of inferiority and pessimism over being handicapped occur frequently and represent a most important consideration in the therapeutic approach. Very essential here is the understanding by the student of his difficulty in factual and non-alarmist terms, and in a way enabling, to the greatest possible degree, the building up of confidence, an open view of the future and a positive life philosophy.

In at least 48 students in this series there occurred definite personality maladjustment in addition to the specific epileptic factor. In 35 cases this maladjustment was manifested in pronounced clinical symptomatology, requiring prolonged and intensive psychotherapeutic effort. For this latter group, where adequate therapeutic contact was possible, decided improvement was observed in over 70 per cent of the cases. This rather gratifying response serves to re-emphasize the importance of a balanced mental hygiene approach to the total situation, of which the attacks are but one aspect. That is, it is imperatively to be borne in mind that in epilepsy as in all medical conditions, we are concerned with living personalities in addition to specific presenting signs and symptoms.

In contrast to the above, the outcomes with respect to the frequency of attacks were not especially encouraging in the majority of cases. The results of medical treatment so far as these could be evaluated from information available at the end of the nine year period are summarized in table VI. Of 38 students who were observed for sufficient time to appraise response to the usual therapeutic procedures as bromide and phenobarbital medication, dietary regulation and fluid restriction, 25 remained unimproved and only 13 or 18.6 per cent of the total showed variable degrees of improvement. In this connection, it should be stated that insufficient cooperation or irregularity in carrying out the prescribed routine was a factor of importance in at least seven of the unimproved cases, the therapy of epilepsy in college being not unlike extramural practice in this respect. With regard to the six cases with petit mal attacks, one was markedly improved, two reported moderate benefit under bromide therapy, and the remaining three were not observed over sufficient time to evaluate results.

TABLE VI.
Results as to Frequency of Attacks at End of Observation Period

	No. of Cases	Per Cent
Very much improved or apparently recovered	6	8.6
Improved	7	10.0
Unimproved	25	35.7
Indeterminate	32	45.7

15 because of too short or insufficient contacts.
17 because only one isolated attack was observed.

Also, from recent experience, it might be indicated that the newer non-sedative anticonvulsant drugs (diphenylhydantoin derivatives) might prove more useful than previous methods, especially in treating students who object to sedatives interfering with attentiveness in classes and during evening hours of study. Further, clinical experience with our group suggests that the college level of adjustment is a definitely trying one for the epileptic patient and likely to be attended by an increase in attack frequency. As evidence of this, in 18 patients who had convulsions of known periodicity before enrollment and who had three or more attacks while in residence, the frequency was doubled in six, variably increased in five and continued unchanged in seven.

Respecting the academic averages* of the group, up to the close of the period studied, 52.8 per cent were satisfactory, 18.6 per cent fair, 18.6 per cent unsatisfactory, and 10.0 per cent did not remain in the University long enough to secure credits. Of the six students who had petit mal attacks, only one was unable to continue because of poor scholarship. The scholastic averages of the epileptic group do not differ markedly from those reported for the students who developed psychoses,[1] and on the whole indicate that over 70 per cent of the former were able to do acceptable academic work.

TABLE VII.
University Status at End of the Nine Year Period

	No. of Cases	Per Cent
Graduated	30	42.8
Continuing in the University	13	18.6
Not at present in attendance but with no actual contra-indication to same on basis of University requirements	9	12.9
Unable to continue in the University	18	25.7

4 because of markedly increased frequency of attacks.
6 because of epilepsy and scholarship.
7 because of scholarship or other administrative reasons.
1 deceased (status epilepticus).

The final terminations or outcomes with respect to University status through the first semester of 1939-40 are shown in table VII. As would be expected, a higher proportion of these patients were graduated or could continue in college than in the psychotic group, the figure actually reaching 74.3 per cent, as contrasted to 49.1 per cent for the latter. Thus in selected instances and especially in association with adequate care and management, epilepsy or the convulsive state as such seems by no means inconsistent with satisfactory college or uni-

*Based on the following scale: Satisfactory, C+ and over; Fair, C to C+; Unsatisfactory, below C grade.

versity performance. In addition, it should be emphasized, close and intensive attention may be especially significant in the college situation because of the age factor and the long period available for observation and treatment. In this way, not only may much be accomplished as to the establishment of a proper therapeutic formula for the attacks as such, but also, and perhaps more importantly, with reference to the constructive orientation of the individual patient to himself, his condition and life, a point of critical moment respecting future adaptation and effectiveness.

Finally, with respect to the convulsive state, as for medical conditions generally, the fullest and most open coöperation is urged on the part of prospective students, their families and medical advisers toward the college, as opposed to the inadequate understanding, reticence, and even actual concealment which seems to a significant extent still to obtain. Obviously, only through frank, collaborative and professional facing and evaluation of the situation in this way can the best good of student and college be served. In cases where admission would not seem at the time a constructive measure, such collaboration might at least lead to a fuller appreciation of the individual situation and the determination of the plan of procedure best suited to the case as it stands. And, for those admitted, adequate treatment and planning as to the college program, both curricular and extracurricular, would thus be made possible from the very beginning of the college period, a matter of considerable practical import. Further, for the college situation, as in other social relations, it is essential that it be realized that the element of stigma, accreted through tradition, has no place in any modern valid conception of epilepsy. In other words, the convulsive state must be envisaged simply as one medical condition among many others, to be appraised upon its clinical merits, broadly conceived, and not of necessity constituting a bar to positive college performance. Such a view on the part of colleges and universities would do much to encourage a fuller and franker coöperation by students, their relatives and physicians, indicated as so essential to adequate evaluation and procedure.

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BLOOD TRANSFUSIONS IN LEUKEMIA AND IN SUBACUTE BACTERIAL ENDOCARDITIS

Recently much publicity has been given to the topic of transfusion of blood to leukemic patients from donors believed to have recovered from the disease. Although this publicity has been limited to numerous newspaper articles, it is obvious that members of the medical profession have been responsible for suggesting to their patients that the procedure might be of value. This has meant that many sufferers from leukemia, and the condition is by no means as uncommon as the newspapers would have one believe, have been put to the insurmountable difficulty of searching for an individual who has recovered from the disease. Friends and relatives of patients too sick to attempt the search themselves, have faithfully sought for such cured individuals through different media, including newspaper requests, radio appeals, letters to universities, and to various clinics. There can be no doubt that the useless effort and expense in this elusive quest has really been considerable. The word "useless" is employed advisedly, because there is no evidence whatsoever that any individual with proven leukemia has recovered. There are, of course, any number of instances of leukemoid reactions to infections, and of infectious mononucleosis resembling leukemia which have undoubtedly been the basis for the belief evidently existing in the minds of some physicians that occasional cases of leukemia do recover. Careful scrutiny of the reports of recovered cases convinces one that the existence of leukemia was not proven in any instance.[1,2]

Even if recovered cases of leukemia were available as donors, proof would still have to be afforded that their blood was of more value than normal blood. The merit of the latter, of course, is only supportive insofar as correction of anemia is concerned. Leukemia is regarded by some as a form of cancer, by others as the result of infection. There is certainly no evidence that patients with cancer are benefitted by transfusions from cured cases, although the latter are available in some measure.

There is likewise no definite evidence that subacute or chronic infections are benefitted in any specific way by

transfusions of blood from donors who have recovered from the same type of infection. Subacute bacterial endocarditis is another disease for which transfusions from healed cases have been advocated, although there is again no reason to believe that this is more beneficial than transfusion from a normal donor. The supposed rationale of transfusing from a healed case is that antibodies are supplied which the victim of the disease does not possess. There is no evidence that this is true, however, and as a matter of fact it is well known that the patient with subacute bacterial endocarditis possesses antibodies against streptococci in very high titer.[3] The reason for his failure to recover is simply that the focus of infection, i. e., the vegetation on the heart valve, cannot be eliminated. When a vegetation occurs in an area which can be excised, as for instance in an arteriovenous fistula, complete cure may follow, even though streptococcus viridans bacteremia and splenomegaly were present.

Although it is possible, even probable, that occasional cases of subacute bacterial endocarditis do recover,[5] it may be emphasized again that a search for these rare individuals with the idea of using them as blood donors for active cases is wholly illogical and without merit. The only rationale for blood transfusion in this disease, as in leukemia, is to support the patient because of his anemia, toxemia, or both, in which event normal blood should be transfused.

Some may feel that what has been said in the foregoing is self-evident and not requiring any special treatment. Judging, however, from the number of requests that the writer has received both from doctors and laymen, either for advice on the above topics, or as to the whereabouts of "cured" cases, it would appear that the whole matter deserves considerable emphasis.

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C. J. WATSON

HOW SHALL WE FIND THEM?

A. A. Milne's delightful book for children entitled *When We Were Very Young* describes the plaintive utterances of the king when he came down to breakfast and found no butter. He said, "Nobody could call me a fussy man; I only want a *little* bit of butter for my bread."

Now, it so happens that the physician has a grievance too. When he makes calls, it is frequently impossible for him to find the house numbers. This is especially true in the newest residential districts. Sometimes the numbers are over the door and sometimes on one of the sides. They may be arranged horizontally or vertically; and at times they are so artistically combined with each other that it is impossible to make out whether they really are figures or portions of climbing vines in a miniature trellis fence. Worst of all, of course, is the number that is the man-who-wasn't-there type. It is bad enough to find sevens that look like ones and unmistakable evidence that parts are missing, but it is positively disconcerting when there is no trace of any at all, as is often the case in the older sections.

The disappointed king refused marmalade as a substitute and went back to bed. The queen spoke to the dairymaid, the dairymaid spoke to the cow, and his majesty got butter for the royal slice of bread. What should the physician do? Should he meekly go back to bed until the citizens and lawmakers and signpainters get their heads together to provide him with a charted course? Must he inquire of each caller whether or not there are proper identification provisions on the house in question? Or would it be better for him to make the proviso that he would gladly come on condition that some member of the family be stationed at the curb with a wig-wag come-hither signal to guide his approach?

A. E. H.

RHEUMATIC FEVER AND SULFANILAMIDE

During a relatively short interval in the month of October, 1939, four out of five consecutive deaths on the pediatric service at the University Hospital were caused by active rheumatic infections. One of the pediatric fellows, Dr. A. Becker, became curious as to the importance of this disease and proceeded to inspect the records from that time through January 15, 1940. She found that from October 1, 1939, to January 15, 1940, thirty-six deaths (exclusive of the neonatal period) occurred on that service. Fourteen of these were in children of school age and of the fourteen, seven deaths were definitely due to rheumatic fever and one indirectly so. Although the time interval is not sufficiently great to make the findings of statistical significance, the results do lend confirmation to the statement which is often made to the effect that "rheumatic fever and rheumatic heart disease is the most serious condition and constitutes perhaps one of the biggest medical problems in children of school age." They are also sufficiently striking to make us realize that we must not adopt a passive attitude toward this disease, thereby overlooking many of its protean manifestations; but must become more cognizant of its often serious and devastating effects.

In a desperate effort to attempt to combat this stubborn infection, almost all physicians dealing with children's diseases have at some time or other tried to administer sulfanilamide as a therapeutic agent. Not only have they learned by first hand experience that this powerful agent is ineffective, but also that some of the cases actually seem to become worse when this drug is administred in ordinary therapeutic doses to the patient in the acute stages of rheumatic fever. With these experiences fresh in mind, it is not surprising that considerable consternation was experienced by those particularly inter-

ested in this condition when Coburn reported in the *Journal of Clinical Investigation*, February, 1939, his experience with the use of sulfanilamide in the prevention of rheumatic recrudescences or recurrences in patients already afflicted with this disease.

He reported that by administering 2 to 3 grams of sulfanilamide daily from late fall until early summer to a series of children who had experienced definite rheumatic episodes but were at the time in a period of quiescence, he was able to prevent a recurrence of the disease in all but one patient during the two years of his study. Confirmation of this observation was presented in a report of a small series of cases in older subjects at Johns Hopkins Hospital. Recent personal communication with Coburn discloses that extension of his studies over still another season with even a greater number of cases revealed the same results. As part of the control series in this study he used the some ten per cent of individuals who were unable to tolerate the drug, as well as a group of others who were not given the medicine the second and third years, after having been treated during the first year of study. In these untreated control subjects, frequent bouts of rheumatic activity occurred.

When one realizes that this rather remarkable result occurred in a condition in which the tendency to recur is perhaps its most remarkable feature (the expected incidence of rheumatic recrudescences according to careful studies of Coburn conducted in N. Y. City being 35 per cent), this type of management becomes even more significant.

However, there are those who in spite of this rather convincing evidence of the possible usefulness of sulfanilamide in rheumatic fever will not sanction its use. Most practitioners are aware of the wide variety and even severity of the toxic manifestations of this drug and will, therefore, hesitate to prescribe it over such an extended period. We feel that they are justified in being cautious. Certainly it should never be administered unless the case is under the control of a physician so that frequent clinical and hematological examinations can be made. Being that most recrudescences of rheumatic fever are preceded one to three weeks by upper respiratory infections of some type, could it be that liberal doses of sulfanilamide administered at the time of the infection for a period of from three to four weeks might be effective in preventing the rheumatic recurrences which tend to follow these infections? It seems that this possibility might justify further investigation in search of a practical method for the administration of sulfanilamide in the control of rheumatic fever.

Arild E. Hansen

Book Reviews

Molding and Casting, by Carl Dame Clark, associate professor of art as applied to medicine, department of art, University of Maryland School of Medicine; Philadelphia: Warren-Knight Co.: 1939. Price, $4.50.

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Technical details in the art of molding and casting have long been kept more or less of a secret by men engaged in that field. The author in his book has taken a very definite step forward in publishing procedures, materials used and formulae employed even to the details of listing the commercial concerns which supply many of these substances. This book discusses all the material which can be used for the making of molds and casts, the advantages and disadvantages and the handling of each. Coloring and mounting of all types of casts is well described. This work is highly recommended to men in the medical field, especially to plastic surgeons, orthopedists and teachers of anatomy.

Economic Aspects of Medical Services, *with special reference to conditions in California,* by Paul A. Dodd, Ph.D., and E. F. Penrose, Ph.D.; Washington: Graphic Arts Press, Inc.: 1939. Price, $3.75.

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Of all the literature on the subject to which the reviewer has had access, he is reluctant to admit that this work is the most comprehensive and objective analysis of the economic aspects of the costs, distribution, and organization of medical services with respect both to those who provide and those who receive such services. Reluctant because the reviewer would have preferred (out of loyalty to his own profession), that such a valuable contribution to this subject might have been rendered by a physician rather than by an economist. Although the authors limited their original investigation to the situation in California, their interpretations and evaluation of other similar researches as well as their own has a national significance. To the 500 pages containing 16,000 vital facts and 141 tables and 57 figures, it is impossible to do justice in a short review. However, here are a few of the more pertinent and practical conclusions and recommendations the authors have offered:

"(1) Health conditions in California present a dismal picture but not a hopeless one. Because of the high costs and the inadequacy of medical care, early changes in the present system of private practice are necessary. (2) Health facilities throughout the state are unevenly distributed. (3) Thousands of persons in families of low incomes in need of medical care are without adequate diagnosis and examination. Public health facilities must be developed and extended in order to carry on more preventive work in defense of the public health and welfare. (4) Average charges for medical care over a year ago are not high, but costs of illness are unevenly distributed. (5) Many practitioners are called upon to donate much free service in the face of low professional incomes. (6) Public health services and appropriations for public health work are inadequate. A compulsory health insurance system should place great emphasis upon preventive as well as curative practice and should promote a close coöperation between medical practice and public health work."

A massive piece of research, thoroughly executed, well organized in its presentation, balanced in its judgment and criticism, the conclusions cautiously drawn, here is a book, which, if read, will stimulate, instruct and challenge the medical profession.

Cardiovascular Disease in General Practice, by Terrence East, M.D., physician in charge of cardiological department, King's College Hospital, London; 206 pages, 43 illustrations; Philadelphia: P. Blakiston's Son & Company: 1939. Price, $3.50.

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This book was written mainly for the general practitioner, to help him overcome the difficulties he meets at the bedside in the diagnosis and treatment of cardiovascular diseases.

The book is written in a simple, elementary style, and the subject of clinical cardiology is well covered. Electrocardiograms are not included as the author feels that they are not necessarily within the scope of this work, primarily intended for bedside diagnosis.

Clinical Bacteriology, by F. A. KNOTT, M.D., M.R.C.P., D.P.H.; 399 pages, plus appendix and index, with 60 illustrations including 12 plates; Philadelphia: P. Blakiston's Son & Co., Inc. Price, $4.50.

This book is concerned with the practical side of bacteriology. It is well written and concise. It deals with infectious diseases and laboratory procedures necessary to arrive at their diagnoses, as well as the prophylaxis of these diseases. It is recommended to bacteriologic laboratory workers and public health workers.

Treatment by Diet, by CLIFFORD J. BARBORKA, B.S., M.S., M.D., D.Sc., F.A.C.P., Department of Medicine, Northwestern University Medical School, Chicago; fourth edition, revised. Philadelphia: J. B. Lippincott Co.

The fourth edition of this book necessitated the revision and rewriting of fourteen different chapters. The section on vitamins had to be completely rewritten in order to bring up-to-date the newly discovered vitamins, the vitamin requirements of man, the clinical aspects of vitamins, and the methods of diagnostic aid in determining vitamin deficiency. Likewise, chapters on the management of gallbladder disease, liver disease, peptic ulcer, nephritis, diabetes, gastritis and allergy had to be rewritten. The new clinical syndrome, chronic hyperinsulinism, has an entire chapter devoted to this subject.

The original purpose of the book, namely, to give physicians a clear, simple, crystallized, practical and workable method of prescribing diets and applying treatment by diet in health and disease, has been maintained in this fourth edition.

Classic Descriptions of Disease, with biographical sketches of the authors, by Ralph H. Major, M.D., professor of medicine, University of Kansas School of Medicine. Springfield, Illinois: Charles C. Thomas; second edition, 1939. Price, $5.50.

The second edition of Dr. MAJOR's book on *Classic Descriptions of Disease* includes several new sections which cover malaria and yellow fever. Additional readings and illustrations have been inserted where necessary. Many of the bibliographic sektches have been rewritten and enlarged. The index has been revised and extended. Dr. MAJOR is unique in his gratitude for the opportunity of publishing a second edition, which affords him an opportunity to correct certain errors and omissions.

This book should always hold a foremost place in all medical libraries. It presents in English 403 selections from the original, epoch-making accounts of 190 authorities whose contributions and discoveries have furnished the foundation of our knowledge of clinical medicine.

Menstrual Disorders, Pathology, Diagnosis and Treatment, by C. FREDERIC FLUHMANN, B.A., M.D., C.M., associate professor of obstetrics and gynecology, Stanford University School of Medicine, San Francisco, California; assistant visiting obstetrician and gynecologist at Lane and Stanford University Hospitals; fellow of the American Gynecological Society. Illustrated. Philadelphia: W. B. Saunders & Co., 1939.

The main purpose of Dr. FLUHMANN's book is to set forth the physiology of the menstrual cycle in women and the various disorders which may occur under the influence of local or systemic disease. Emphasis has been placed upon the important endocrine factors which have become so important recently. Because the discussion of menstrual disorders entails symptoms of unknown etiology (functional) every effort has been made to guide the physician in determining the causative factors and in removing them through sound therapeutic measures and agents. Treatment has been directed not solely to the basic cause of the disease, but also to the relief of symptoms.

This volume is divided essentially into two sections, one of physiology and one of functional pathology.

Endocrinology in Modern Practice, by WILLIAM WOLF, M.D., M.S., Ph.D., endocrinologist to the French Hospital, etc. Second edition, completely revised. Philadelphia and London: W. B. Saunders & Co. 1939.

The second edition of Dr. WOLF's *Endocrinology in Modern Practice* includes the added features of descriptive sections, the useful diagnostic and therapeutic procedures associated with each endocrinal problem. Of the important new material included in the second edition, the following may be mentioned: A thorough discussion of protamin zinc insulin; the syndrome of chronic hyperinsulinism; the technic of endometrial section biopsy; a thorough consideration of the autonomic nervous system and the endocrinal glands; an up-to-date review of the vitamins; the relation of blood pressure to endocrinal disturbances; and the new potent and standardized glandular products which are now revolutionizing certain functional medical diseases.

The metabolism of calcium, phosphorus, sodium, potassium, manganese and iodine have been elucidated. New diagnostic procedures such as the iodine tolerance test and calcium balance determination have been included. The more recent therapeutic measures for the symptoms of the menopausal state have been thoroughly discussed.

Baptism of the Infant and the Fetus, An Outline for the Use of Doctors and Nurses (fourth edition), by REV. J. R. BOWEN, Chaplain, St. Joseph Mercy Hospital, Dubuque, Iowa. M. J. Knippel Co., Dubuque, Iowa. 25c.

Because of the belief and teaching of the Catholic Church that Jesus Christ explicitly declared that baptism is absolutely necessary for salvation, this small pamphlet on baptism is presented as a practical outline for the use of doctors and nurses. In an orderly manner it discusses how to baptize, conditional baptism, baptism of the premature fetus, baptism in cases of difficult labor, baptism of the fetus within the uterus, baptism when a pregnant mother is dying, baptism when a mother dies during a pregnancy, and finally baptism of monsters.

A Textbook of Surgery, by American Authors, edited by FREDERICK CHRISTOPHER, B.S., M.D., F.A.C.S., associate professor of surgery, Northwestern University Medical School, chief surgeon, Evanston (Illinois) Hospital. 1381 illustrations on 752 figures. Second edition, revised. Philadelphia & London: W. B. Saunders & Co. 1939.

In his preface the author states that surgery has developed with such rapidity that it is no longer possible for anyone to be experienced in, and intimately acquainted with, all of its branches. He therefore justifies a surgical textbook written by authorities on various subjects. Because the first edition of the textbook on surgery was received with such a warm welcome and appreciation, the editor feels this volume should be kept up to date by subsequent editions. Because death has taken several of the contributors to the first edition, new authors have been asked to revise these original chapters. These include sections on the gallbladder and bile duct, on wounds of the chest, on neoplasms of the nose, pharynx and nasal sinuses, on duodenal ulcer, and on the spleen. An entirely new chapter on wounds has been included.

A new section on cancer of the lips and tongue has been prepared as well as new sections on congenital obstruction of the bile duct and on duplications of the alimentary tract. The chapter on tetanus, on lymphogranuloma inguinale, on the anatomy of the anal canal and rectum, anal fistula, anorectal venereal diseases, benign rectal stricture, anorectal tuberculosis and prolapse has been added. In addition, in nearly every section important additions and deletions have been made. The new chemotherapeutic drug, sulfanilamide, has been discussed by twelve authors. The new syndrome, protruded and intervertebral disc, is included.

This textbook on surgery is one of the most complete to be found in the English language.

Societies

TRANSACTIONS OF THE MINNEAPOLIS CLINICAL CLUB

Stated Meeting
Thursday, December 14, 1939
The President, James K. Anderson, M.D., in the Chair

PARALYSIS IN THE LOWER EXTREMITIES DUE TO SPINAL CORD TUMOR

(*Case Report*)

Norman Johnson, M.D.
MINNEAPOLIS, MINNESOTA

This case is presented tonight because it contains many interesting diagnostic errors which amount practically to tragedy inasmuch as the parents for more than eight years sought, in high places and in low, a proper diagnosis of their daughter's disability and found no one able to appraise properly the pathology involved. The result was that a most winsome and delightful personality was permitted through inadequacy to become a serious cripple.

History. The patient is a 20-year-old unmarried woman 5 feet tall and weighing 100 pounds. The occasion of my first visit was an injury received two hours previously when she slipped on a coat-hanger in the coat-closet and suddenly sat down. For a moment there was a feeling of numbness. When she tried to rise again there was pain in the lumbar region which became considerable on any effort she made toward getting up. She became exceedingly frightened, thinking she had done herself some damage. Her family carried her upstairs, placed her in bed. Her reaction to this rather slight incident differed tremendously from reactions on other occasions of seemingly greater import. For instance, a few months previously she had fallen all the way downstairs and was not emotionally upset. The family related that, during the past year or two, a tendency to fall had become more and more frequent and that she had had some pretty nasty tumbles but none to which she reacted in this fashion.

On this occasion she was exceedingly hysterical. She preferred to lie perfectly motionless in the bed in a left Simms position. Any pressure on the mattress or any attempt to move her increased the pain and also the hysterical symptoms. Dr. M. O. Henry seeing her with me—both of us for the first time—could find no evidence of fracture though the examination had to be conducted under narcosis and therefore presented difficulties. There was no deformity; but in the left upper leg considerable atrophy of the quadriceps existed and the diameter at mid-thigh was about 2 inches less than on the right side. There was also a rather marked scoliosis of the dorso-lumbar spine toward the right, some considerable kyphosis of the upper dorsal and lordosis of the lumbar spine, and a contracture of the left tendo-achilles with some evidence of peroneal weakness. According to the family this had been present for some time; in explanation of it a diagnosis of infantile paralysis had been made four years previously. There was an absence of the knee-jerk on the left, even after reinforcement. The pulse was very fast, between 135 and 150, regular, and rather weak in quality. Blood pressure was 110/90.

Since the major finding seemed to be a tachycardia and a marked alteration in behavior never duplicated in the past life of the patient, it was felt that the inability to walk was on a basis of reaction to the injury and to fear. This obtained further support by drawing from her the following story: on the day prior to her fall she had seen a cripple pass the house whose disability had been severe enough to make a great impression on her. She admitted wondering if she might ever become similarly afflicted. The first image after she had fallen down was a mental picture of this cripple. This seemed to me a satisfactory explanation of the present events; but the record of the past several years, as it was drawn from members of the family, did indicate considerable doubt as to the accuracy of the diagnosis of infantile paralysis. The patient was encouraged to walk and, being a very coöperative person, made valiant attempts; but the weakness of the left leg seemed to have been markedly increased since her fall. Pain continued in the back but not so severely and, inasmuch as pain had existed intermittently in this area over the past eight years, neither the patient nor myself put much significance upon this symptom. Encouragement and reassurance, with daily neurological checks, were the routine during the next week while she attempted to restore the ability to walk to its previous level.

Since the diagnosis of infantile paralysis, which had been made independently by two different orthopedists and subsequently maintained by a third, seemed an incorrect explanation of the changes evident in the left leg, it seemed important to re-evaluate the previous illness. This began some eight years prior when the patient was 12. The onset was indefinite. There was no antecedent illness. Pain began in the left knee and was chiefly troublesome while in bed at night. There was a dull ache in and around the knee joint without noticeable swelling, heat, or redness. This continued for two months. The only febrile illness associated with the onset of this pain had occurred two or three years previously and was of four days duration and of unknown origin. No trauma had been received prior to the onset of pain in the knee. At some indefinite time about this period she had been thrown against an object in the tonneau of the car and struck this object with her lower back so that pain and a temporary disability resulted. This incident was recalled, however, after careful questioning and could not be placed chronologically in reference to the onset of the pain in the knee.

After two months the pain transferred to an area around the left hip and was sufficiently severe to keep her from school during the autumn term of that year. Shortly after Christmas she returned to school but a fall on the ice injured her left knee and pain again returned at that locus. It was chiefly nocturnal and prevented sleep. Occasionally it was so severe that she would get out of bed and dance about the floor. In evaluating the diagnosis of infantile paralysis made four years later, this seemed to me to be a significant point in the history of onset, and not at all suggestive of poliomyelitis.

Within the next few months the pain was felt in a new location, chiefly in the lower lumbar area with radiation down the left leg to the knee. She was taken to see Dr. Little, who was unable to demonstrate anything wrong. The following summer she remembered continuance of the pain in the back and left hip while at a camp.

On the return to the city she was taken to Dr. Gillette, an orthopedic surgeon, who found no abnormality and made a diagnosis of neurosis. "How could she be anything but nervous with a mother like that" was the concluding remark to this examination. The next three years passed without significant development. She was in and out of school, had occasional pains in the areas described, saw several physicians, and some osteopaths and chiropractors. In the fifth year of this development she began to notice tenderness to pressure across the dorso-lumbar area. She was then taken to see a general practitioner who took the first X-ray of the spine and diagnosed tuberculosis of the spine. He removed her from school from early spring until summer and gave her bed rest with heliotherapy. She was underweight, which defect was improved during the bed rest. During the following summer she felt exceptionally well in a camp at Cass Lake where she was able to swim and play with the other girls and her weight increased to 96 pounds. I have viewed the films taken by this doctor and cannot agree with the diagnosis of tuberculosis in the spine. My purpose in making this review was for comparison with the films which I eventually had taken on this patient and I believe that there was no defect of any kind evidenced in the X-ray of the spine in this fifth year after onset. With the oncoming autumn a new development was noted. For the first time the leg would suddenly seem to "give way" and she would sit down, or fall down, on the spot. A small photograph taken at this time shows some slight disparity in the size of her two legs. It is possible that at this time the left leg was a little smaller than the right. With this new development came a cessation of the previous pain.

It is at this time that an orthopedist first introduced the idea of infantile paralysis to explain the syndrome. I have no findings from his examination but it can be assumed that some atrophy of the left quadriceps with absent knee jerk and a toe-drop appeared at this time because, for the next four months she was placed in a cast from the toes to the knee, with the foot in hyperextension. The patient recalls some difficulty in her ability to dorsi-flex her foot. By the following spring she was dragging the left foot behind her when she mounted stairs. Her weight at 18 years of age was 86 pounds.

The next summer she was taken to a clinic where the orthopedic department called attention for the first time to the scoliosis, with rotation in the lumbar region; and to the weakness of the left quadriceps and the adductors of the left hip. Also weakness was discovered then in the peroneals with contraction of the tendo-achilles. The legs were found to be equal in length. A positive diagnosis of infantile paralysis was sustained and exercises and massage outlined. During the balance of the year she submitted to muscle-training exercises, was able to dance, and did not fall as frequently as previously. Nine months later her weight had dropped to 73 pounds and she was ordered to bed by an internist for five weeks on a high calory diet. With this regime she gained 27 pounds but, upon getting up, found her disability in the left leg much worse. There was a marked toe-drop and a marked limp. The left leg seemed to her to be shorter than the right and she needed stabilizing support on one side in attempting to walk. Falls became more frequent and she was no longer able to dance. In falling, she stated, the left knee or hip seemed to "give way" or she tripped easily while dragging the left foot forward. There was no pain on weight bearing. She could not lie flat on her back with her legs extended without pain. A complete neurological examination done at this time added nothing helpful although this record was not available for re-study. No further X-ray pictures had been taken and the doctor who had her in charge gave evidence of uneasiness concerning the accuracy of poliomyelitis as a diagnosis. Three months later, the accident in the coat-closet made it necessary to demonstrate the true nature of the previous illness.

In this presentation only the details of physical examination that are considered important are included. All this time the patient had had an excellent attitude toward her illness, remained cheerful, but lately had become somewhat nervous and cried on slight provocation. During this illness there had developed a slight edema of the left foot. It was also noted that the foot seemed cold to the touch. She fatigued easily, had a poor appetite and suffered from nausea and occasional vomiting after her meals. This last tendency had increased during the past year, especially since her fall downstairs. Usually she got up once each night on account of nocturia and she complained somewhat of incontinence of urine at times when laughing. Previous studies of her gastro-intestinal tract by X-ray and of her urine had been negative.

Physical Examination. Shortly after the accident on April 10, the patient was able to commence walking but found her left leg almost useless with no power of extension at the hip. She could place her left foot in position by pushing it with the opposite foot while being supported under the arms. She could take a few steps by swinging the left leg in a wide arc and could not bear her weight while standing alone. Physical and neurological examinations showed no significant abnormalities above the costal margin except for the dorsal kyphos and the rapid pulse rate. The scoliosis in the dorso-lumbar area was rather pronounced. There was a prominence between the symphysis and the umbilicus which was at first thought, because of difficulty in ability to urinate following the accident, to be due to a full bladder. After the return of urinary function this prominence persisted and was probably due to the rather marked lumbar lordosis. Atrophy of the quadriceps and of the lower leg and contracture of the tendo-achilles have been mentioned. The left foot was cold, somewhat edematous, cyanotic.

The positive neurological findings were: *Abdominal reflex*: Hyperactive on the right, normal in the left upper quadrant, very much diminished in the left lower quadrant. *Knee jerks*: Hyperactive on the right but absent with reinforcement on the left *Ankle jerks*. Hyperactive on both sides, more pronounced on the right than the left *Ankle Clonus*: Babinski, Oppenheim, Gordon test, showed no abnormality. *Sensation*: No disturbance to light touch or painful stimuli except for hyperesthesia on the sole of the left foot and diminution of the sensation to light touch over the left quadriceps. *Temperature sense*: No disturbance.

After about two weeks of attempts at walking there began developments *on the right side* to neurological examination which had not been present before. The jerks became more active On April 28th an ankle clonus developed on the right or sound side, and a positive Babinski test was elicited. There also appeared changes in the temperature sense by which on the right foot cold was constantly reported as hot. Vibration sense, which had been absent on the left, was now absent on both sides from the toes of the feet to the iliac crests. It was also apparently lost over the spinous processes as high up as the cervical region.

With this development Dr. Arthur Hamilton was called in neurologic consultation. He postulated, as the result of his investigation, a crushing injury to the cord and spinal nerve roots of an extent constituting an emergency. He believed the original condition was probably not poliomyelitis and probably was something causing bone deterioration. He felt unable to diagnose the initial lesion; placed the level of the injury producing the motor and slight sensory disturbance at the twelfth thoracic or first lumbar.

X-ray was taken showing, in the lateral view, a marked compression fracture of the body of the first lumbar vertebra with anterior displacement of the lower fragment and with the right transverse process rotated posteriorly. There was rotation of the whole lumbar spine with scoliosis. In the excitement of the discovery, the film was removed before the X-ray expert had opportunity to study it. Operation was requested, and Dr. M. O. Henry did a laminectomy on May 8th involving the 11th and 12th dorsal and first and second lumbar vertebrae. The patient reacted badly to the operation and gave considerable concern. In consequence, speed in accomplishing reduction of pressure on the spinal cord was imperative. The patient was ready to leave the table one hour and five minutes after the operation was begun. Dr. Henry found erosion of the pedicles and laminae. A large, pulsating, multilocular, cystic tumor completely filled the operative field exposed by the laminectomy. The upper limits of this tumor extended above the laminectomy and could not be defined. The same was true of the lower limits. Laterally no boundaries could be established within the view permitted by the operation. The tumor seemed to be very vascular with large vessels existing in its wall. Visible pulsation was noted, the rate coinciding with the heartbeat. The tumor mass obscured the dura everywhere and extended laterally between pedicles.

Because of the condition of the patient, the vascularity of the tumor, and the accomplishment of the original indication for the operation, no attempt was made at biopsy for fear uncontrolled bleeding or complicating factors might lengthen the procedure. It was not determined whether the tumor was malignant or benign but, because of its size and intimate interrelations with the various strucrures, the operator believed it inoperable. The wound was closed and the patient, after a stormy day or two, made a reasonable recovery.

The lateral film of the area was again surveyed and there was now apparent what should have been obvious before operation,—that the bodies of three vertebrae above and the two below the compression fracture of the first lumbar gave plentiful evidence of pressure necrosis. As a matter of fact the widening of the spinal canal produced by this tumor mass was so extensive that it was simply overlooked when focus was directed to the site of the fracture.

Because of the rather gloomy prognosis given to further operative procedure, the family were disinclined to permit an attempt to remove the tumor mass though they were constantly advised to accept this as the one reasonable course of action. Nine months later, the nerve root pain became so agonizing that the family could no longer endure the suffering and gave consent. On February 16, nearly nine and one-half years after the onset of the original symptoms, Dr. A. W. Adson removed

a neurofibroma which is described on his operative record as follows: "Very extensive and situated partly within and partly without the dura. The tumor was cystic and degenerating and had not only eroded the laminae but also the bodies of the 11th and 12th dorsal, 1st, 2nd and 3rd lumbar. The tumor was situated on the left lateral aspect and was so large that, when it was completely removed, the space it occupied was more or less fusiform and extended from about the middle of the 10th dorsal vertebra above, to or below the body of the 3rd lumbar vertebra inferiorly. It was about 4 or 5 cm. at its greatest diameter. There was compression of the cord on the left side and several filaments from the 10th dorsal to the 1st lumbar were involved by passing through the mass. It was impossible to suture the dura. The spinal cord was transposed about 2 inches to the right."

Postoperative History. As the result of the tumor and the surgery, the patient was left with a badly distorted spinal column showing marked angulation and rotation. In the left extremity below the 12th dorsal segment there was loss of all sensation, and loss of muscular ability in most of the muscle groups. On the right there remained about 50 per cent function. The bladder was a typical cord bladder which has become automatic. Furuncles and pressure sores developed very easily and healed slowly because of the anesthesia on the left side. In spite of the nerve trauma there is remarkably little atrophy added to the pre-existing muscular atrophy on the left. With the aid of braces, always on the left leg and sometimes on the right, plus the use of crutches, the patient taught herself during the next several years to get about surprisingly well. She has had some very bad falls on stairs and a year ago broke her left ankle in one fall, which fracture did not unite for nine months. The possession of a spirit which radiated happiness, and an excellent adjustment to every disappointment, has enabled this young woman to continue in life in a fairly normal fashion. She is married and living happily with a poliomyelitis cripple who is more disabled than she. They have recently built themselves a home and each of them can drive a car which has to be specially prepared.

Conclusion. I have presented a long drawn-out clinical history which defeated the ability of many excellent men in an attempt to evaluate it. The proper diagnosis was eventually forced upon those interested by a succession of events. Subsequent skillful surgery plus a radiant personality and an undaunted spirit produced as happy an ending as could be obtainable under the circumstance. This presentation represents, as much as anything, a desire to pay tribute to that personality and spirit in the patient. It would seem that the most devastating of a series of mistakes was the original diagnosis of infantile paralysis which would not have been made had a careful history been elicited of the onset of the disease. The failure of anyone to secure spinal fluid analysis was perhaps the most outstanding omission. It is interesting to note that a tumor of such size could produce by its location a motor paralysis with practically no sensory components until after the effects of fracture had been superimposed.

Discussion

Dr. M. O. Henry: "Our operation exposed the massive tumor in the spinal canal. These X-rays, of course, were taken 13 years ago and reveal that our X-ray technique has improved a good deal since that time; they indicated a crushed vertebra and that was all. At the time of operation, the tumor seemed so extensive I did not think it could be removed. Dr. Adson did a remarkable job. I exposed four segments, and seeing no limits of the tumor either way, thought it was inoperable. It was fortunate we did not attempt excision for if we had not stopped when we did, I do not think the girl would have lived. We are all glad the ending of this case has been so happy."

INFECTIONS OF THE HAND DUE TO HUMAN MOUTH ORGANISMS

(Inaugural Thesis)

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Infections of the hand due to invasion of tissue by organisms found in the human mouth are deserving of consideration besides that given to infections of the hand in general. The mechanism of injury is frequently typical and the organisms responsible are different than those found in the ordinary hand infection. The serious consequences of wound contamination by mouth organisms is well known and although treatment of injuries suspected of such contamination is fairly well standardized, some reiteration of important points is not amiss. I wish then to discuss various points regarding these injuries and infections and consider a number of cases.

That the human mouth is a potential source of infection is strikingly born out by Rosenthal and his associates, who examined the saliva of a number of animals including elephants, baboons, pigs, dogs and rats, and found that the bacterial count of animal saliva was low in comparison to that of man. The human mouth harbors a number of organisms including staphylococcus albus and aureus, streptococcus viridans, micrococci, and members of the Friedlander group. There are also some gram negative bacilli such as B. proteus and B. lactis aerogenes. The organisms with which this discussion is particularly concerned are the B. fusiformis and the Vincent's spirillum. According to Tunnicliff and other investigators, there is evidence that the fusiform bacillus and spirilla are forms of the same organism. It is more commonly thought that they are distinct species growing together with mutual advantage. Other spirochetal forms are also found in the mouth.

Supposedly, Rauchfus in 1893 was the first to demonstrate the fusiform and spirilla forms in a pathologic process and consider them together as an etiologic agent.

The fusiform bacillus is a rod of varying size and shape and is found with the spirochete between the teeth, on the gums, and in the tonsillar crypts. It is also found about the genitals and in the stool.

In the presence of lowered oxygen tension, the symbiosis of the bacillus fusiformis and spirochetal forms occurs, which is evidenced in tissue as an extremely virulent inflammation characterized by necrosis of tissue and a foul discharge. The general reaction is marked by fever and leucocytosis. The period of incubation of these infections is remarkably short and severe swelling, pain and general reaction may follow in a period of two hours.

The symbioses responsible for the infection under consideration also cause Vincent's infection and are responsible for certain lung abscesses. Contamination about the head and neck may result in noma and in kindred necrotic processes.

In the search for mouth organisms in a wound, smears and culture should be made. The technic followed at the Minneapolis General Hospital consists of implantation of the material on blood agar and also in brain broth, which gives a fairly good anaerobiasis. At the same time, media are implanted using a so-called microaerophilic technic which results in an atmosphere of about 10 per cent carbon dioxide. This latter reduces the number of streptococci and staphylococci in the culture.

The mechanism of injury which causes the original wound is fairly constant. The usual history is of a blow struck with the clenched fist, and an abrasion or laceration over the knuckle results from contact with the teeth of the opponent. Certain infections are due to deliberate bites by an opponent. Occasionally the finger is infected through the medium of nail biting.

In one area, namely the dorsum of the metacarpo-phalangeal joint, the infection takes a rather distinct and typical route. Here the anatomy is particularly receptive to conditions for a growth of mouth organisms and from the original infection the route of spread is fairly typical. Infections from mouth organisms elsewhere about the hand follow the routes of spread described by Kanavel and others.

Mason and Koch have studied the typical knuckle injury in the same manner as Kanavel studied other hand infections;

that is by injection of radio-opaque material into an area and from the spread of the material as determined by X-ray, determined the route of spread of infection. They precede their experimental data by a discussion of the anatomy of the dorsum of the knuckles. In a laceration over the dorsum of the metacarpo-phalangeal joint, infection may be introduced into the dorsal subcutaneous space, the dorsal subaponeurotic space and the metacarpo-phalangeal joint. Due to the position of flexion when the hand is made into a fist, the skin and extensor tendons are stretched tightly across the joint and the infectious material is introduced, usually into the joint, at a point proximal to the attachment of the extensor tendon to the joint capsule. After extension of the finger the original tract of entrance is sealed off and an ideal condition of anaerobiosis occurs. Occasionally infection is introduced directly into the web spaces and there is a potential communication with other spaces about the hand. After infection has developed, the area about the wound becomes red, and a foul watery discharge develops. On the dorsum of the hand in the typical case, the edema is great. The deep parts of the wound of entrance are grayish and obvious necrosis is present. Lymphangitis frequently occurs.

When the acute stage has ended, secondary abscesses may occur. Necrotic tissue may still be present in the area about the original wound even after the initial excision. Pockets predisposing to anaerobic conditions may be present. The joint spaces may be involved, with erosion of cartilage and secondary osteomyelitis.

When healing begins, the wound is a slowly healing ulcer. The joint, if involved, becomes in some cases ankylosed or partially so. Sequestration of the osteomyelitic process may occur and small pieces of bone be discharged from the wound.

Mason and Koch describe the spread of infection from the metacarpo-phalangeal joint as invasion into the subtendonous bursa, the dorsal subaponeurotic space, the web space, thence distally or proximally into the interosseous spaces and from these into the deep palmar space.

In cases in which the infection is introduced into the dorsal space of a finger, the route is frequently into the neuroarterial sheaths. There may be a spread into the palmar space via the lumbrical canals. Only in late cases is the flexor tendon sheath involved.

Treatment of these bite infections has been unsatisfactory. Most regimes attempt to attack the specific agent as well as to treat the infection in a general way. When patients with injuries suspected of contamination from the mouth present themselves before infection has developed, surgical excision of the wound should be carried out and an attempt should be made to convert a state of anaerobiosis to one in which oxygen has full access to tissues. This excision is best done with a scalpel. Excision by means of cautery only leaves more dead tissue as a medium for bacterial growth. Any strong antiseptic should be avoided. Gentle cleansing with soap and water and hydrogen peroxide should suffice. Rest of the part is imperative and splints should be applied. Bates has treated over one hundred cases with electrocautery and only two of them have needed hospitalization. Welch at Massachusetts General has treated three cases seen within twelve hours and these have healed after cautery and excision. He states that one case in ten required amputation if seen within twelve hours and that amputation is necessary in one-third of the cases seen twelve hours or longer after injury.

After infection has occurred, excision of the wound is carried out as before. The patient can be treated satisfactorily only in a hospital. Bed rest is required. Massive hot packs with proper splinting should be instituted. As the character of the disease changes, it may be necessary to incise abscesses or excise areas of necrosis which develop. As healing begins the hot packs may be changed for dressings of cod liver oil. Any sequestrae developing from osteomyelitis should be removed gently if they appear in the wound. Amputation of a digit is occasionally necessary but I believe this procedure should be reserved for a time when the infection is no longer acute.

Various specific drugs have been tried in an effort to combat the fusiform bacillus and spirochaete. Neoarsphenamine and related drugs applied both locally and intravenously seem to be of little value, both in our experience and that of various writers on the subject. Dakin's solution has been used but the small area of involvement makes the use of Carrel-Dakin technic unsatisfactory. In our hands the use of zinc peroxide paste as described by Meleny has been unsatisfactory and the feeling has been that while oxygen may be liberated by the mixture, the ointment obstructs drainage.

The use of sulfanilamide taken orally is of questionable value, this drug at any rate not having any specific demonstrable action against the fusiformis and spirochaete. When streptococci are present as secondary invaders, the drug is undoubtedly useful. Whether or not sulfanilamide powder introduced into the fresh wound suspected of mouth contamination is of value is undetermined. Sodium perborate and also potassium permanganate have been tried with questionable results. Rosenthal and his associates found that the saliva of animals contained sodium carbonate and felt that this inhibited the motile forms of mouth organisms. An investigation into the pH of infections from human mouths might lead to some therapeutic information. The use of sodium carbonate locally may have some clinical value.

The literature contains numerous reports on human bite infections. Hultgen described in 1910 what is believed to be the first case of human mouth organism infection of the hand recognized as such. His was a case developing in the finger after nail biting.

Peters and Hennessy, and Fletcher reported isolated cases as did Fuller and Cottrell, Pilot and Meyer, and also Flick. The patient reported by Flick died after infection and gangrene had extended to the arm.

Mason and Koch reported a series of thirteen cases. They feel that treatment after infection is present should be conservative and state that joint involvement does not necessarily lead to ankylosis.

McMaster has reported sixty-eight cases with nine amputations.

At the Minneapolis General Hospital in the period of 1935 through October 1939, there have been twenty cases hospitalized because of infection resulting from human bite or because of the probability of infection from such a source. One patient was admitted to the psychiatric service for a psychosis of undetermined origin. He had escaped from a private institution and had at the time of escape completely amputated the terminal phalanx of each index finger with his teeth. He was in residence for only an hour and his case is therefore not included.

An undetermined number of patients have been treated by excision or cautery and excision and discharged for observation without having been formally admitted. Of the twenty cases the right hand was involved in sixteen, and the left in four. The injury occurred in sixteen men, there were three children and one woman. The histories note that the wound was sustained by striking the fist against the teeth in twelve cases. The finger or hand was deliberately bitten during a fight in six cases. One case followed nail biting and in one case no history was obtainable. At the time of admission, sixteen patients had a full blown infection, thirteen of these showing marked edema, redness, foul discharge from the wound, and some general reaction as evidenced by leucocytosis and rise in temperature. Three infections were classified as lymphangitis and the hand showed only mild local inflammation. One case was admitted a month after injury after having received considerable treatment elsewhere. On admission he had several abscesses needing incision and had developed an arthritis of the metacarpo-phalangeal joint.

Of the sixteen cases admitted with acute infection, only one had received treatment at the time of the injury. Treatment in that case was primary suture of the laceration.

Twelve hours had elapsed since injury in one case, twenty-four hours in two, forty-eight in three and the time elapsed in the remainder was up to six days. In one case the time was not noted.

Treatment usually consisted of the application of massive hot packs, splinting, incision of abscesses and excision of necrotic areas. Amputation was carried out in one case. Also used were hypertonic saline soaks, hydrogen peroxide, zinc peroxide, sodium perborate, neoarsphenamine, Dakin's solution, cod liver oil, and sulfanilamide by mouth. There was no outstanding agent in this list.

Smears and cultures were not taken in all cases but in the three in which results were positive, one showed spirochetes, one staphylococcus aureus, and one gram positive cocci and gram negative bacilli. Because operations were frequently done when the service of the bacteriologist was not available, material was not always properly handled.

The hospital stay of the thirteen infected cases, excluding lymphangitis, averaged 24.1 days, individual patients being in residence from six to one hundred days.

Patients with lymphangitis stayed an average of 4.3 days.

Arthritis of the metacarpo-phalangeal joint developed in one case. Osteomyelitis of the metacarpal or phalanx, or both, with arthritis of the joint occurred in four cases. In one case the flexor tendon was involved and became necrotic.

It was possible to re-examine after a long interval, three of the patients who had acute infections, exclusive of lymphangitis, on admission.

Case No. 1. A white male, aged 24, now a laborer. In 1937 he injured his left hand in a fight, sustaining a laceration over the third metacarpo-phalangeal joint. The wound was sutured shortly afterward. He was admitted to the hospital forty-eight hours after injury. The hand was swollen, red and there was a thin foul discharge from the wound. The wound and the surrounding tissue were excised by cautery. Hot packs, Dakin's packs, and hypertonic saline soaks were used. Prontylin was given by mouth and several secondary abscesses about the knuckle were incised. He developed an osteomyelitis of both metacarpal and proximal phalanx. He was discharged on the thirty-seventh day. At the present time the disability is limited to the metacarpo-phalangeal joint, at which joint there is no motion.

Case No. 2. A white male, aged 53, a laborer, was bitten on the left second finger in a fight six days before admission in June 1939. Examination disclosed an infected laceration on the side of the finger with surrounding redness and induration. The wound was excised with a cautery and it became necessary to repeat the excision on two occasions. Smears of the tissue at the time of the first excision showed spirilla. Hot packs, neoarsphenamine locally and intravenously, and zinc peroxide did little to change the course of the infection. This patient eventually developed an invasion of the flexor tendon sheath following which the distal portion of the tendon became necrotic and was removed. He was discharged on the twenty-third day. At the present time the terminal phalanx of the second finger is shiny and shrunken. Sensation is absent. Motion at the distal joint is absent and at the proximal interphalangeal joint is limited to 75 degrees.

Case No. 3. A negro male, aged 25, unemployed, was injured in a fight several days before admission in July 1939. Examination disclosed a small laceration over the knuckle of the second finger. The dorsum of the hand was greatly swollen and motion of the finger caused exquisite pain in the metacarpophalangeal joint. His temperature was 101.2 degrees and the leucocyte count was 15,000. This patient was given hot packs and splints were applied. He was also given neoarsphenamine and sulfapyridine. Zinc peroxide was also used. Secondary abscesses were opened on several occasions. Osteomyelitis of the metacarpal and proximal phalanx with suppurative arthritis developed. His hospital stay extended over fifty-five days. At the present time there is no motion at the third metacarpophalangeal joint. There is a 20 degree range of motion in the second metacarpo-phalangeal joint and about 50 degrees of motion in the fourth and fifth joints. All the interphalangeal joints are somewhat limited.

Conclusions

Infections of the hand due to human mouth organisms are not uncommon. The bacteriology of the mouth is such as to provide a symbiotic growth when conditions for anaerobiosis are present and these conditions are found frequently in the hand.

Treatment should be adequate before infection occurs and should consist of procedures calculated to correct the anaerobiosis. Treatment after infection is present should be conservative.

Prognosis should be guarded. Arthritis and osteomyelitis are frequent sequelae.

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Discussion

Dr. Willard White: That "infections of the hand" is an important subject is well recognized by everyone. Invasions of the tissues of this member by human mouth organisms is not so well appreciated and its seriousness is often underestimated. Consequently it is profitable that the subject should be called to our attention at this time.

Special consideration is due to infections in the hand from organisms found in the human mouth for two reasons. One is an anatomical one and the other is a bacteriological one. As Dr. Fritzell has pointed out the wound most commonly seen in which this infection occurs is on the knuckle and it results from fighting when a tooth is struck and the skin broken and organisms are implanted into the wound when the fingers are straightened out the subcutaneous tissue moves upward under the wound of entrance sealing the cut and producing anerobic conditions. As has been pointed out by Dr. Fritzell there are present in the mouth in addition to the more commonly encountered pathogenic organisms in a wound, the anerobes bacillus fusiformis and spironema vincentii which are different forms of the same organism. The extent of the spread of the infection depends mostly on the site and depth of the injury. The structure of the hand is such that infection spreads along typical pathways and involves tissue spaces, joints, tendon sheaths or under fascial planes according to a definite anatomic sequence. As Dr. Fritzell has mentioned the dorsal subcutaneous and the sub-aponeurotic spaces are frequently involved.

In discussing treatment I would emphasize the importance of adequate attention as early as possible. That these wounds are of importance is indicated by the fact that the average stay in the hospital in the cases reported was 24.1 days and that one patient remained 100 days. The earlier the patient is seen the better is the chance to limit the spread of infection. Careful cleansing of the wound is one of the most important parts of the treatment. The infection cannot be killed off by applying strong antiseptives. Careful washing with soap and water is as effective a means of removing germs present in and around the wound as can be obtained. Local excision of the wound and not allowing anerobic conditions to persist in the wound is possible in some instances.

In those cases where a spread of the infection has already occurred it is very important to treat the patient in a hospital with absolute rest in bed, splints, massive hot packs and frequent examinations and to figure out where the infection is likely to spread to from its location. The fact that osteomyelitis by extension may occur should be remembered. If the infection has been going on for some time before the patient is seen, X-ray examination should be made.

One other point I would bring up is that any open wound may be infected by mouth organisms from the surgeon or other attendants during the first examination. A patient may be brought to the office or hospital with a recent laceration or other open wound. The doctor talks as he removes the first-aid dressing and examines the wound. It is just as likely for this wound to become infected by droplets from the mouth as a laparatomy wound. Consequently the nose and mouth of the surgeon should be covered with a mask before the wound is uncovered.

Ernest R. Anderson, M.D., *Secretary.*

Minnesota State Board of Medical Examiners

Julian F. DuBois, M.D., Secretary
230 Lowry Medical Arts Building
St. Paul, Minnesota

DOCKET OF CASES

Unlicensed Physician Sentenced to 50 Day Jail Term at Slayton

Re: STATE OF MINNESOTA *vs.* JOHN G. HALLAND

John G. Halland, 46 years of age, who formerly was licensed to practice medicine in the State of Minnesota, was sentenced on November 29, 1939, by Justice of the Peace J. K. Campbell at Slayton, Minnesota, to a term of 50 days in the county jail, the sentence to be served in the county jail of Cottonwood county. Judge Campbell found Halland "guilty of interfering with the rural schools of Murray county by frightening the teachers and inspecting school records without proper authority from the County Superintendent or the Commissioner of Education."

Halland graduated from the Medical School of the University of Minnesota, in 1919, with the degree of Bachelor of Medicine. His license as a physician was revoked by the Minnesota State Board of Medical Examiners in November 1931, because of habitual indulgence in the use of drugs. Halland has not been licensed to practice medicine in Minnesota since that time. He has a long record of difficulties with the law dating back to 1925, when he served one year in jail at Santa Fe, New Mexico, for a violation of the Federal Narcotic Law. In 1927-1928 Halland served 14 months in the Federal Penitentiary at Leavenworth for a similar offense committed at Denver, Colorado. In 1932 he served 70 days in the Minneapolis Workhouse. In September 1933, he pleaded guilty in the District Court at Fergus Falls to an information charging him with the crime of practicing medicine without a license. He received a suspended sentence of six months at that time.

Minneapolis Naturopath Sentenced to 4 Year Prison Term for Abortion

Re: STATE OF MINNESOTA *vs.* THOMAS N. VISHOLM

On January 15, 1940, Thomas N. Visholm, 76 years of age, was sentenced by the Honorable Frank E. Reed, Judge of the District Court of Hennepin County, to a term of not to exceed four years at hard labor in the state prison at Stillwater, Minnesota. Visholm had previously pleaded guilty, on December 22, 1939, to an indictment charging him with the crime of abortion committed on or about the 14th day of December 1939, at the defendant's combination office and residence at 2312 Humboldt Ave. South, Minneapolis. Following an investigation of the case by the Probation Officer of Hennepin County, and a statement to the Court by Mr. Brist on behalf of the Minnesota State Board of Medical Examiners, Judge Reed stayed the execution of the sentence and placed Visholm on probation for a period of five years, during which time Visholm will be subject to the rules and regulations of the Probation Officer, and among other things, he is to absolutely refrain from practicing healing in any manner in the State of Minnesota.

Visholm was arrested following an investigation by the Women's Bureau of the Minneapolis Police Department of a report that a criminal abortion had been performed by him on an unmarried girl who resides at New Brighton. At the time of his arrest deputy sheriffs and police officers seized Visholm's surgical instruments and equipment used by him in the performing of criminal abortions. The girl who had been aborted, was taken ill and removed to the Minneapolis General Hospital. She has recovered and has been discharged from the hospital. The girl stated that she paid Visholm $50.00 for his services.

Visholm stated that he was born in Denmark in 1863, and that he has been in this country 40 years. He holds no license to practice any form of healing in the State of Minnesota, and stated that he has a diploma in mechano-therapy from the American College of Mechano-Therapy at Chicago, dated November 18, 1908. He has lived in Minneapolis for about 20 years and has represented himself to the public as a naturopathic physician. At the time of his arrest he was representing himself as a physiatric specialist in women's ailments. Prior to residing at the Humboldt Avenue address Visholm practiced at Portland and Lake Streets and at 1700 West Lake Street. Visholm, when questioned by Judge Reed about practicing without a license, stated to the Court that the naturopaths had attempted on four occasions to have naturopathy recognized by the Minnesota Legislature, but that the bill had been defeated each time.

The Minnesota State Board of Medical Examiners approves of the disposition made of this case due to the defendant's advanced age, and because of his frankness in acknowledging his guilt at the time of his arrest, and other circumstances connected with the case. The Medical Board also wishes to acknowledge the very prompt and splendid work done in this case by the Women's Bureau of the Minneapolis Police Department, and particularly by Lieutenant Blanche Jones, head of the Bureau, and Mrs. Carrie Bystrom and Miss Gladys Cooke, police women.

Minnesota Physician Reprimanded for Failure to File Birth Certificates

Following repeated complaints from the Division of Vital Statistics of the Minnesota Department of Health that certain members of the medical profession in Minnesota were violating the laws of this state in reference to the filing of birth certificates, the Minnesota State Board of Medical Examiners ordered an investigation to be made to determine the facts and what steps are necessary to be taken to secure the coöperation of those physicians who repeatedly neglect, or refuse, to comply with those laws. That investigation disclosed that a small number of physicians have repeatedly failed to comply with the birth registration law and with no plausible explanation for their failure. At the November 1939 meeting of the Minnesota State Board of Medical Examiners one physician was ordered to appear before the Board and explain his repeated failure to comply with those laws. The facts in that case indicate that it was necessary for the State Department of Health to send him nine letters in a period of four years in their attempt to secure birth certificates in cases attended by that physician. In addition, a personal call had been made upon the physician by a representative of the State Department of Health and also by a representative of the State Board of Medical Examiners. Despite the leniency extended this physician he still had outstanding two birth certificates, one as far back as March 1939, and another in June 1939. In this case the physician was advised by the State Board of Medical Examiners that unless he complies with the law in the future, a citation will be issued requiring him to show cause why his license as a physician should not be suspended or revoked.

The investigation made by the Medical Board clearly shows that the State Department of Health has been extremely lenient with the medical profession in this problem. On the other hand, there is no good reason why it should be necessary for local registrars and the State Department of Health to spend a great deal of time and money securing birth certificates from the attending physicians. It is not the desire of the State Department of Health to be severe, nor unreasonable, in the enforcement of the laws pertaining to births, nevertheless, it is very apparent that the law must be enforced and that it is of extreme importance to the patient, to the child, to the public in general, and to the governmental authorities, that these certificates be filed. The law itself is very simple; the pertinent portions thereof could be summarized as follows:

1. The law requires the physician or midwife attending the birth of any child to subscribe and file a birth certificate with the local registrar within *five* days after the birth of the child.

2. If no name has been given the child within that time, the attending physician or midwife shall deliver to the parents

a blank for a supplemental report of the given name of the child.

3. The law also provides that when a certificate of birth is filed without the given or baptismal name the local registrar shall deliver to the parents a blank for a supplemental report of the name.

4. If the child is illegitimate the name, residence and other identifying details relating to the father, cannot be entered in the birth certificate without the consent of the father.

5. The law also provides that any person who shall violate any of the provisions of the law shall be guilty of a misdemeanor and shall be punished by a fine of not more than $100.00 or imprisoned in the county jail for not more than 90 days.

Most of the violations of this law on the part of the medical profession, are occasioned by the failure of the attending physician to file the birth certificate within the statutory period. The great majority of the physicians in Minnesota file these birth certificates promptly and within the period provided by the law. It is the hope of the Minnesota State Board of Medical Examiners that those physicians who are violating this law, will make it a point, in the future, to comply with it. Certain it is, that further violations of the law will result in the suspension of the medical licenses of the physicians involved.

Two St. Paul Men Plead Guilty to Forging Medical Prescriptions for Alcohol

Re: State of Minnesota *vs.* Benda

Re: State of Minnesota *vs.* Foote

Following a joint investigation made by the Liquor Control Commissioner of Minnesota, the Minnesota State Board of Medical Examiners and the St. Paul Police Department, evidence was procured that resulted in the prosecution of Frank Benda, 35 years of age, and Walter Foote, 23 years of age, for forging and presenting fictitious medical prescriptions for alcohol to registered pharmacists. Due to the fact that the evidence indicated that the alcohol was used for their own consumption and not for resale, they were permitted to plead guilty to a misdemeanor and were each fined $50.00 or 30 days in the St. Paul Workhouse; each paid the fine. They were admonished by Judge Finehout that a repetition of this offense would bring a much more severe sentence. Benda and Foote have been employed for sometime as meat cutters for the National Tea Company, Benda living at 391 Selby Ave., St. Paul, and Foote at 1265 Dayton Ave., St. Paul. Up until the spring of 1939, they had been obtaining their alcohol at the Sundry Drug Store at Rice and Summit Ave. in St. Paul, but their source of supply was shut off when Sundry was sentenced to 30 days in the St. Paul Workhouse for a violation of the State Liquor Control Act in connection with the filling of fictitious medical prescriptions for alcohol. Shortly thereafter it was discovered that similar prescriptions were being filled at the River Road Pharmacy at 14—27th Ave., Minneapolis, operated by one Harold Smetana. Practically all of the prescriptions bore St. Paul addresses and had been forged by Benda and Foote, both of whom admitted that they obtained the prescriptions from Smetana, and this was also admitted by Smetana. Some of the physicians' names that were forged to these prescriptions are as follows: Doctors A. A. McDonald, C. Godwin, B. T. Thomson, B. C. Thomson, B. C. Clark, F. C. Clark, George G. Clark, W. W. Johnson, A. C. Caldwell, Gorden Weed and M. G. Goldbend.

The Minnesota State Board of Medical Examiners adopted the policy, several years ago, of coöperating with the State Liquor Control Commissioner in enforcing the law with respect to medical prescriptions for alcoholic liquors. Due to the fairness of the legislature of Minnesota, and other public officials, the medical profession enjoys the privilege of writing bona fide medical prescriptions for alcoholic liquors without any requirement of a special license fee or governmental order book, or any other red tape, and a registered pharmacist is permitted to fill these prescriptions upon the payment of a $5.00 annual license fee. Obviously, unless this law is respected by the medical profession and the pharmacists, other steps will undoubtedly be taken by the legislature to correct this evil. It is very apparent that the large majority of the medical profession and the registered pharmacists, comply with the law, but there is still a small number of physicians, pharmacists and others, who continue to violate this law. The Medical Board has attempted to give suitable publicity to the position taken by the Board, and to the fact that medical men will be prosecuted in the Courts for a violation of this law, and in addition, they subject themselves to a suspension or revocation of their license as physicians, one physician already having had his license suspended for a period of three months.

Benda was arrested on October 5th, and entered a plea of guilty on October 7th, 1939. Foote was arrested on October 11th, and entered a plea of guilty on October 12th, 1939.

License of Willmar Physician Revoked Following Conviction for Criminal Abortion

In the Matter of the Revocation of the License of

Iver S. Benson, M.D.

At the regular meeting of the Minnesota State Board of Medical Examiners held in St. Paul on November 3, 1939, the license to practice medicine formerly held by Iver S. Benson, M.D., of Willmar, Minnesota, was revoked. Dr. Benson had been previously served with a citation requiring him to show cause why his license as a physician and surgeon should not be revoked because of the procuring, aiding and abetting, on his part, of criminal abortions. Dr. Benson is confined in the State Reformatory at St. Cloud, Minnesota, following his plea of guilty on September 28, 1939, in the District Court at Willmar, Minnesota, to an information charging him with the crime of abortion. Dr. Benson is serving a term of not to exceed four years, following the death on August 15, 1939, of a young married woman from Montevideo, Minnesota.

Minneapolis Physician Sentenced to 5 to 20 Years at Hard Labor Following Conviction for Manslaughter

Re: State of Minnesota *vs.* R. J. C. Brown, M.B.

On November 25, 1939, Richard J. C. Brown, Negro physician of Minneapolis, was sentenced to a term of not less than 5, and not more than 20, years at hard labor in the State Prison at Stillwater, Minnesota, by the Honorable Arthur W. Selover, Judge of the District Court of Hennepin County, following Brown's conviction, on November 22, 1939, by a jury, of the crime of manslaughter in the first degree. Brown was arrested on August 16, 1939, by the Minneapolis Police Department on the complaint of the father of a 22 year old Minneapolis girl, upon whom it was alleged that Brown had performed a criminal abortion on July 31, 1939. At that time Brown was charged with the crime of abortion. However, the girl died at the Minneapolis General Hospital on August 23, 1939, and prior to her death she made a statement naming Brown as the one who had performed this criminal abortion. Subsequently Brown was indicted on August 29, 1939, by the grand jury of Hennepin County along with one Martin Schmidt. The indictment charged them with manslaughter in the first degree. Both defendants entered pleas of not guilty and their bond was fixed in the sum of $5,000.00 each. Brown's trial commenced in the District Court on November 16, 1939, and ended with the jury returning a verdict of guilty on November 22, 1939. Brown did not take the witness stand in his own behalf. The defendant Schmidt was named by the deceased girl as having recommended that she go to Brown, and as having furnished her with the $25.00, which it is alleged was paid to Brown for his services.

The defendant Brown was born in Lincoln, Nebraska, January 17, 1893, and graduated from the University of Minnesota June 17, 1920, with the degree of Bachelor of Medicine. He was licensed in June 1920, by the Minnesota State Board of Medical Examiners by examination. According to the records at the University of Minnesota, Brown never completed his internship and the degree of Doctor of Medicine was never conferred upon him. Judge Selover granted Brown a stay of execution of sentence until December 30, 1939, to permit the defendant to make a motion for a new trial.

News Items

Dr. V. J. La Rose, Bismarck, North Dakota, was re-elected president of the North Dakota Anti-tuberculosis association at the annual meeting, February 6. Other officers are: Dr. J. Grassick, Grand Forks, honorary president; Governor Moses, honorary vice-president; Dr. W. A. Wright, Williston, vice-president; Dr. Fannie Dunn Quain, Bismarck, treasurer; and Mr. E. J. Taylor, recording secretary.

Dr. J. C. Ohlmacher, Vermillion, South Dakota, director of the state health laboratory, addressed the Seventh District Medical society on "Bone Sarcomas", February 19.

Dedicatory ceremonies opened the new $65,000 city hospital at New Rockford, North Dakota, recently.

Dr. Roy E. Christie, Bowbells, North Dakota, has been appointed superintendent of the Burke county board of health and member of the county insanity board.

Dr. Henry F. Helmholz, Rochester, Minnesota, has been appointed to a national citizens' committee to work for child welfare the next ten years. He was named by Frances Perkins, Secretary of Labor.

The Glenwood Community hospital, Minnesota, was formally dedicated February 18.

Dr. Albert Balmer who has been practicing with Dr. E. F. McElmeel of Pipestone, Minnesota, has opened his own office in Pipestone.

Dr. William J. Noonan, a graduate of the University of South Dakota medical school and the University of Chicago college of medicine, has opened an office in Minneapolis. His practice is limited to urology.

Dr. Lloyd Gilman, formerly of Osceola, Wisconsin, is now in Atwater, Minnesota where he purchased the practice of Dr. Jensen.

Dr. M. Kern, formerly of Rogers, Minnesota, is now practicing in Melrose, Minnesota.

Dr. E. H. Nelson, Chisholm, Minnesota, was honored at a testimonial banquet given by the Junior Chamber of Commerce on February 5.

Dr. Mario Fischer, Duluth, Minnesota, health officer, was elected president of the Tuberculosis and Health association of St. Louis county at the annual meeting February 13.

Dr. C. E. Rea of Minneapolis is taking charge of the Vogel and Seifert clinic in New Ulm during the absence of Drs. Seifert and Vogel, who are in Florida.

Dr. H. Milton Berg of the Quain & Ramstad Clinic, Bismarck, North Dakota, addressed the Stutsman County Medical Society at Jamestown, North Dakota, February 29. His subject was "The Radiation Therapy of Cancer."

Dr. David Schuele, Albert Lea, Minnesota, has moved to Chatfield where he is associated with Dr. Charles Woodruff.

Dr. Walter A. Fansler, Minneapolis, will deliver several papers at the 12th Annual Spring Clinical Conference of the Dallas Southern Clinical Society, Dallas, Texas, March 11th to 14th.

Dr. James K. Anderson, Minneapolis, delivered a paper entitled "Office Proctology" January 23, before the Black Hawk Medical Society at Waterloo, Iowa. He also addressed the Red River Valley Medical Society at Crookston, Minnesota, on February 22.

The American Physicians' Art Association, composed of over eight hundred physicians in the United States, Canada and Hawaii who follow some form of Fine or Applied Art as an avocation, will hold the next annual art show at the Belmont-Plaza Hotel, New York City, June 10th to 14th, incl. This Exhibit is held in conjunction with the American Medical Association Convention to be held at the same time in the vicinity of the Belmont-Plaza. All physicians in active practice or retired who have an art hobby including photography are cordially invited to participate in the New York Exhibit. To become a member of this Art Association a physician may join by mailing a check for one dollar to the Treasurer, Dr. R. W. Burlingame, San Francisco County Hospital, San Francisco, Calif., and briefly state what art medium the applicant follows. For detailed information kindly write to the Executive Secretary, Dr. F. H. Redewill, 526 Flood Bldg., San Francisco, Calif.

ATTENTION SECRETARIES OF DISTRICT SOCIETIES

Space is at your disposal in The Journal-Lancet for advance notices and reports of meetings of your society and personal news items concerning members of your society. County and district secretaries are invited to forward such material to The Journal-Lancet, 84 S. 10th St., Minneapolis.

Necrology

Dr. C. R. Christenson, 72, pioneer physician of Starbuck, Minnesota, died January 14, 1940.

Dr. Leonard John Nilles, 37, Rollingstone, Minnesota, died at the Winona General hospital February 2, 1940. Dr. Nilles was graduated from the University of Minnesota medical school in 1936.

Dr. O. N. Birkland, 51, of Hibbing, Minnesota, died February 2, 1940. He had been a member of the Rood Hospital staff for 22 years.

Dr. M. M. Hauge, 64, Clarkfield, Minnesota, died at his home February 14, 1940.

Dr. Arne Zetlitz, 75, former Sioux Falls, South Dakota, surgeon, died at his home in Long Beach, California. He left Sioux Falls 18 years ago.

The JOURNAL LANCET

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New Series

Renaissance

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New York City, New York

Rebirth of interest in the control of tuberculosis has marked the fourth decade of the twentieth century. Most striking evidence of this interest is furnished by the increase in medical literature dealing with tuberculosis. Several admirable volumes devoted to this subject have appeared recently, but the growth of current articles in medical journals gives a truer measure of professional interest.

In 1933 the *Journal of the American Medical Association* printed approximately fifty articles and abstracts dealing with tuberculosis. In 1939 the number reached the extraordinary total of over three hundred such items.

Two reasons for this renaissance are easily recognized. Surgical procedures have transformed the old trench warfare into an aggressive attack on the disease. Of like importance, forty years of intensive popular health education has won community coöperation and a rededication on the part of doctors and laymen alike to the task of putting an end to this preventable cause of human misery.

To this rebirth no single contribution is more potent than that of the medical journals. Among these the JOURNAL-LANCET has been well out in front. For many years the April issue has been devoted to the subject of tuberculosis and the current issue surpasses in interest and value its notable predecessors.

†Managing Director, National Tuberculosis Association.

Antenatal Tuberculosis*

Report of a Case in a Premature Infant

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Albert V. Stoesser, M.D.
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ANTENATAL tuberculosis is today generally believed to be of extremely rare occurrence.[1] In reviewing the reports of various investigators, we find that statistics concerning the incidence of this condition are wholly inconsistent.

The first authentic case of antenatal tuberculosis was reported by Schmorl and Birch-Hirschfeld[2] in 1891, and since that time many other cases have been recorded.[3,4] In 1915 Pehu and Chalier[5] accepted 51 cases of antenatal tuberculosis as being definitely proven. Whitman and Greene[6] in 1922 found that 113 authentic and 519 doubtful cases of antenatal tuberculosis had been reported in the literature. Five years later, however, Baldwin, Petroff and Gardner[7] accepted only 60 cases in the literature as being authentic. Available evidence is at the present time not sufficient to permit us to make any conclusive statements concerning the frequency of this condition. It is highly probable, as has been stated by many investigators, that many cases have been overlooked or mis-diagnosed in the past and that the condition, although of relatively rare occurrence, is actually more common than has hitherto been suspected.[6,8] Scheer[9] states that antenatal tuberculosis constitutes 5 per cent of all infant tuberculosis.

The condition described by J. Honl[10] in 1894, in which tubercle bacilli are present in fetal organs without microscopic or macroscopic manifestations (status bacillarus), would lead one to suspect that many cases of antenatal tuberculosis have never been recognized.[11] Also, if any weight is to be attached to the theory that the tubercle bacillus in its very early form exists as an ultra-virus, it is entirely conceivable that many cases of infant tuberculosis are actually latent cases of antenatal infection giving rise to signs and symptoms late in infancy when the bacilli are fully developed.[12] The case reported by Chiari[13] of a 2½ year old child presenting unmistakable evidence of antenatal tuberculosis, namely, involvement of the liver and portal lymph nodes exclusively, lends support to the view that antenatal tuberculosis may remain latent for some time.

The frequency with which tuberculosis occurs in infants and children born of tuberculous parents has led to five possible explanations.[6] 1. That there is a hereditary transmission. 2. That germinal transmission by the ovum or spermatazoon occurs. 3. That a special predisposition rather than the disease itself is inherited. 4. That the offsprings are subjected to increased exposure. 5. That the child is infected in utero, either by way of the placental circulation or through aspiration of infected amniotic fluid.

*From the pediatric division, Minneapolis General Hospital, and the department of pediatrics, University of Minnesota.

Of these, the most widely accepted are the latter two. That the placenta and amniotic fluid of tuberculous mothers may contain tubercle bacilli was amply demonstrated by Palacios.[14]

The most common route of antenatal infection is through the placental circulation, in which case the primary focus develops in the liver and portal lymph nodes. Less commonly, infection may result from aspiration of amniotic fluid, in which case the primary focus develops in the lungs.[15] By either route a miliary tuberculosis may develop. The duration varies from twenty-four hours to two and a half years. The prognosis for the mothers bearing these children is almost universally bad, death usually resulting from miliary spread, often with terminal meningitis.[16,17]

The following case report is one in which there was no postnatal exposure to tuberculosis, inasmuch as the infant was removed from the obstetrical ward immediately following birth.

The case was that of a 38-day old infant born at the Minneapolis General Hospital on June 28, 1939. At the time of birth the baby weighed 1475 grams and was born during the seventh month of gestation. Prenatal and family history were negative. The mother had had eight other normal deliveries; six of the children are still living and two died shortly after birth—cause of death undetermined. The labor lasted three hours and delivery was uneventful. At birth the child was cyanotic and had slightly labored breathing. Examination showed a small premature infant, normal in other respects. The child was transferred to the pediatric service immediately, having had no further contact with the mother. Her condition remained fairly good while on the pediatric service until July 26, at which time the temperature rose to 102F, and from that time on the temperature spiked daily to 103F, finally rising to 105F on the day of death. Coincident with the rise in temperature, she developed an intractable diarrhea associated with frequent spells of cyanosis and a persistent hyperpnea. Repeated examinations revealed no definite cause for the respiratory and intestinal distress; however, the clinical picture was much like that of a pneumonia and she was treated accordingly with continuous oxygen therapy, parenteral fluids, frequent blood transfusions and respiratory and cardiac stimulants. Death occurred on the thirty-eighth day of hospitalization—August 3, 1939. At that time the weight was 2000 grams, the infant having gained 575 grams since birth.

At autopsy the body was that of a small, fairly well developed premature female infant with a crown-heel length of 43 cm. Hypostasis and rigor were present. There was no edema, cyanosis or jaundice. The pupils were each 4 mm. in diameter.

The peritoneal surfaces were pale, smooth and shiny, and the cavity contained no abnormal fluid. The appendix was normal. The diaphragm was at the level of the fifth rib bilaterally. The pleural cavities were free from fluid and adhesions. The pericardial sac was normal.

The heart weighed 20 grams. The foramen ovale was physiologically closed, and the valvular and mural endocardium showed nothing of note. The chambers appeared to be of normal size. The root of the aorta was smooth.

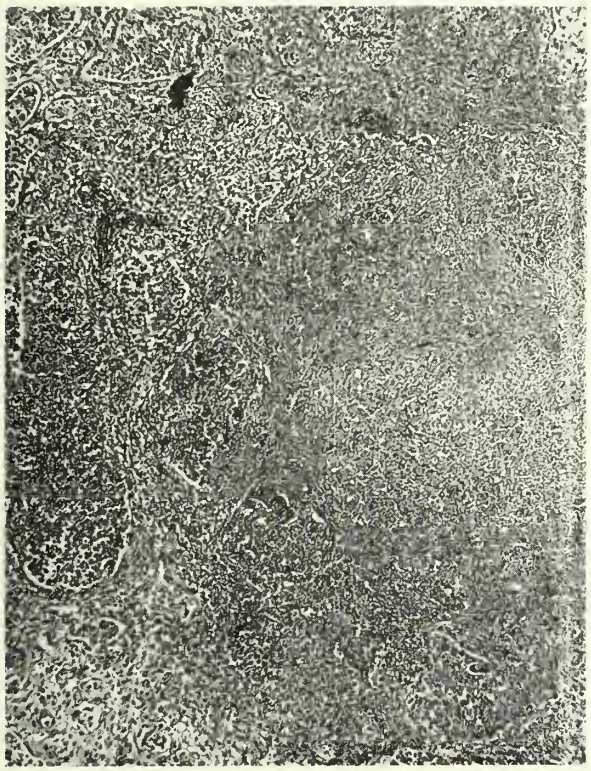

Fig. 1. A section of the infant's lung showing a necrotic tubercle surrounded by tuberculous granulation tissue. Photomicrograph.

Fig. 2. A portion of a bronchial lymph node from infant showing necrotic tubercle. Photomicrograph.

The right lung weighed 26 grams, the left lung 30 grams. They floated midway in water. There was moderate congestion of both lungs inferiorly, but the remainder of the lungs were pink and friable. In the right upper lobe there were two firm, yellow, slightly elevated subpleural nodules, about 1 cm. in diameter, which on section extended into the substance for about the same distance. A faint suggestion of wedge-shaped distribution was present. On pressure, thick creamy material was expressed from punctuate areas within these nodules. A similar nodule was present in the right lower lobe. There was a firm, non-crepitant, subpleural nodule, approximately 7 mm. in diameter, of normal color, in the right middle lobe. On section it did not show the changes visible in the aforementioned nodules. A nodule similar to those in the right upper lobe was present in the left lower lobe. Of all these nodules only one was noted in which the peripheral portion of the nodule was only partially subpleural, the periphery of the remaining nodules appearing to be entirely subpleural. Section of the remainder of the lungs showed congestion inferiorly, and a small amount of purulent material could be expressed from a punctate area in the right base. On further section of the lungs many other similar small nodules were found deep in the parenchyma.

The spleen weighed 10 grams. No gross abnormalities were noted.

The liver weighed 130 grams. No gross abnormalities were noted.

The pancreas and adrenals were normal. Each kidney weighed 11 grams. Slight fetal lobulation was present.

The region about the thymus and apparently in its substance contained numerous firm yellowish nodules, similar to those found in the lungs. On pressure, thick creamy material could be expressed from these nodules.

The scalp and calvarium appeared to be normal. There was no tear of the tentorium cerebelli or falx cerebri and no intra- or extra-dural hemorrhage. The brain showed too severe post-mortem autolysis to be properly interpreted. No tubercles were noted, but a rather greyish cystic wall, apparently representing the wall of one ventricle, was noted.

A few small hilar lymph nodes were found in the left lung, and on section some of these contained whitish central portions. A similar node was found along the trachea.

Microscopic examination revealed the following in the lung. Numerous polymorphonuclear cells and large necrotic mononuclear cells were seen in the bronchi and alveoli. Another section showed a similar picture and a well-circumscribed area of necrosis with a few surrounding atypical epithelioid cells. No giant cells were noted, nor was there any peripheral zone of lymphocytes. The necrotic material did not appear caseous, and in many areas the epithelioid cells had oriented themselves in a circumferential direction to give a surrounding thin zone resembling a zone of fibrosis. Smears of this type of tubercle showed numerous acid-fast bacilli. Figure 1 illustrates a large tubercle seen on microscopic section of the lung. A few small atypical tubercles were seen in the liver. These showed central necrosis which did not appear caseous. No giant cells or appreciable surrounding zone of lymphocytes were present. A few areas containing more or less atypical tubercles were noted in the spleen. Multiple tubercles similar to those described in the lung, but with a somewhat more pronounced epithelioid reaction were noted in the thymus and lymph nodes. A number of large and small lymphocytes were present in the sinuses. Figure 2 illustrates a large tubercle seen on microscopic section of a bronchial lymph node.

Several well-circumscribed cortical adenomata were noted in one adrenal. An extracapsular hemorrhage was present in the other adrenal. It did not invade the gland itself. One vessel at the edge of the hemorrhage was surrounded by a number of mononuclear cells.

No tubercles were visible in the brain and spinal cord. No meninges were present on the sections examined. Nothing of note was found in the aorta, diaphragm and kidneys.

Immediately following delivery, the mother (age 33) began to run an elevated temperature from 100 to 102F and con-

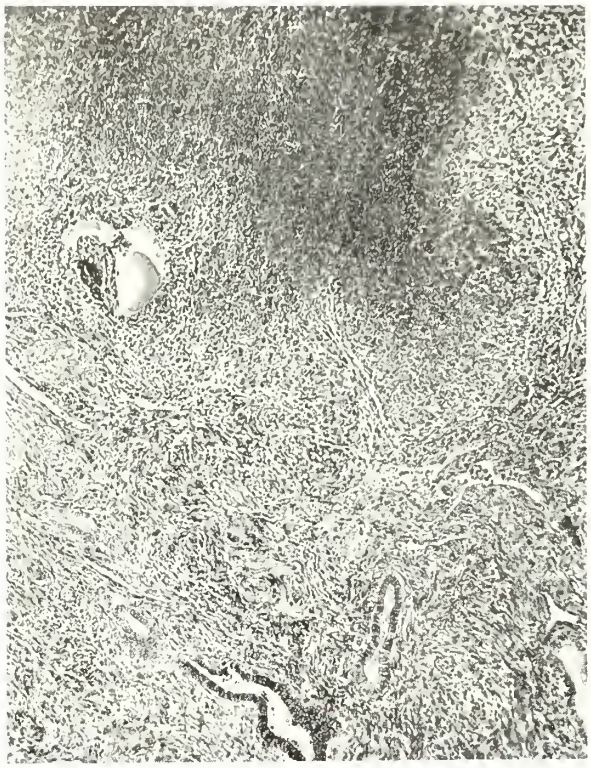

Fig. 3. A section of the endometrium of mother showing necrotic tubercle surrounded by tuberculous granulation tissue. Photomicrograph.

tinued to run this temperature daily. Mantoux test on admission was strongly positive. Roentgenogram examination at the bedside eight days after delivery showed no evidence of pulmonary pathology. On the ninth day postpartum, a somewhat elongated mass was palpable just to the right of the umbilicus. It extended from the anterior superior spine of the right ileum down along the course of the right broad ligament, becoming somewhat wider at its most dependent basilar portion. This mass was slightly tender when first discovered, and the shape and size had not changed at any time. Barium enema examination in an attempt to outline this mass revealed the cecum and ascending colon to be displaced medially due to the presence of the mass, which occupied the right iliac fossa.

With the autopsy findings of the infant in mind, the mother was taken to the operating room and the cervix was biopsied and the lower uterine segment curetted on August 8, 1939. The pathologist reported a tuberculous involvement of the endometrium and cervix. Figure 3 represents one of the tubercles seen on microscopic section of the endometrium.

Further roentgenogram studies of the chest indicated the possibility of a capillary bronchiolitis, it being rather questionable whether or not the changes in the chest could be due to miliary tuberculosis. During her hospital stay of 65 days catheterized urines were negative repeatedly. The hemoglobin varied from 77 to 63 per cent. The white blood count ranged from 5,000 to 9,900 with a differential of 77 per cent polymorphonuclears, 20 per cent lymphocytes, 2 per cent monocytes and 1 per cent eosinophiles. The sedimentation rate varied from 117 mm. to 125 mm. in 90 minutes. Repeated sputum examinations were negative for tubercle bacilli. Stools were negative for blood and tubercle bacilli. Treatment was symptomatic with the exception of several courses of sulfanilamide. On August 31 she was transferred to Glen Lake Sanatorium, where further roentgenogram examinations on September 11 revealed the pulmonary process to be miliary tuberculosis. Death occurred from generalized miliary tuberculosis on October 23, 1939.

Autopsy studies revealed the presence of: 1. Nodular pulmonary tuberculosis. 2. Generalized miliary tuberculosis. 3. Tuberculosis of the peritoneum. 4. Tuberculosis of the endometrium and cervix. 5. Appendiceal abscess with communication into the cecum. 6. Tuberculosis of the right uterine tube.

Summary and Conclusion

This case is one in which there was definitely no postnatal exposure to tuberculosis. The findings suggest an antenatal tuberculosis arising from aspiration of infected amniotic fluid since involvement was found at autopsy to be most marked in the respiratory tract of the infant. Unfortunately neither the placenta nor the amniotic fluid was available for examination inasmuch as the condition was not suspected until the baby was studied at necropsy. We wish to stress particularly that at no time after birth did the infant have contact with the mother.

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Tuberculosis in China*

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TUBERCULOSIS in China must have existed as far back as 3,000 B. C. or even earlier, for in the book of Su Wen (2698 B. C.) we read of a disease with its dangerous symptoms of spitting blood, cough and shortness of breath. In 1155 B. C. a condition resembling scrofula was recorded in Shang Hai Ching, and, from the Huai Nan Tsu printed in 779 B. C., we learn about a disease called *cheng-lit,* which is tuberculous cervical adenitis. A wasting disease described in the Nan Ching (651 B. C.) is probably consumption, but it was T'sang Kung who gave the first authentic description of *lao-ping* or pulmonary tuberculosis in 180 B. C. In Chao's books on pathology (610 A. D.), tuberculosis was confused with neurasthenia. During the Tang Dynasty (610-909 A. D.) tuberculosis seemed to be well recognized under various names, but not until the time of the Sung Dynasty (960-1276) was tuberculosis established as a definite devastating disease. Between 1161-1174 the theory that tuberculosis might be due to germs was first advanced. Evidently these authors did not refer to microscopic germs, but to worms visible to the naked eye as we know from Liu Yuan Su's drawings of six kinds of tuberculous germs made in 1200. Hsu Chun Fu (1557) first pointed out, in Chinese literature, that the tuberculous germs were infectious.

As early as 1500 various writers advocated rest, fresh air and nutritious food as important aids in the treatment of the disease. Among some of the drugs recommended in the Pen T'sao (about 2000 B.C.) for phthisis, which are still being used in modern medicine are *ma-huang* (ephedra), *kan-tsao* (glyceryrrhiza), and *sung* (pinus albus). For scrofulous swelling a decoction of *yeh-chu-hua* (wild chrysanthemum) and *hsiang-shih* (quercus) root smashed up into paste was to be applied locally, and *shui-chin* (aenanthe), *lu-huo* (rhynehoria volubilis) and *hsuan-shen* (scrophularia oldhami) were to be eaten raw. It may be of interest to mention the fact that for ages the Chinese have believed that after the lungs of domestic animals were cooked with almond for several hours, the extract would have the effect of soothing the lungs in phthisis. *Ah-chiao* (glue from the cow or the ass) is prescribed for hemopthysis. In recent years as various important compounds have been isolated from organs of animals, the practice of organotherapy by the Chinese does not seem so ridiculous after all for from the pig's lungs modern science has extracted fibrinogen, which is essential for blood clotting. Since opium was introduced in China at the end of the sixteenth century, no doubt many of the addicts have had chronic tuberculosis, but in Chinese writings this drug was never recommended for this disease.

It is interesting to note that since the seventeenth century and for a long time afterwards, tuberculosis was not referred to as a serious disease in Chinese literature, whereas, leprosy was regarded with horror as an incurable and contagious disease, whose victims were strictly isolated from society by shutting them out from any direct contact with the family or relations, and the girls from families with a history of leprosy were usually shunned by prospective bridegrooms for fear of contagion. In Hobson's report (Missionary 1841) tuberculosis in China was believed to be "slower in its progress and less frequent than with us." It is probable that during this period (1600-1912) the Chinese people had the most immunity against the disease after centuries of repeated infections with it or that its prevalence was unrecognized.

Tuberculosis, a Modern Menace in China

Tuberculosis was not considered a major problem by the modern medical men in China until 1932 when the first tuberculosis conference was held in Shanghai under the auspices of the Chinese Medical Association. In the five decades prior to the conference, tuberculosis was treated as any other disease in private, mission or government hospitals in various parts of the country, differing from leprosy or acute infectious diseases like smallpox, for which about twenty-three leprosaria with 3,000 beds provided for the former and isolation hospitals for the latter. Practically no survey work for tuberculosis was done, therefore no effort was made to control the disease, thinking that tuberculosis was not as important a problem as other epidemic diseases like plague or cholera. But when Li's findings showed the mortality of tuberculosis in Peiping to be 524 per 100,000 in 1926-27, and, over the four year period to 1931, it still averaged 384, while in Shanghai for four years ending in 1932 it was 244 per 100,000, and in Hongkong, 319, the medical men began to realize that if this rate (300 per 100,000) were applied to the population of China (400,000,000) the number of deaths due to tuberculosis would be 1,200,000 annually, and the number of cases of clinical tuberculosis (number of deaths $\times$ 10) would be 12,000,000, a figure far exceeding the worst of any known epidemics in China. These figures were so alarming that before the conference ended various energetic measures were taken to combat the disease. The Tuberculosis Club was formed in Peiping, and plans were made to enlarge the sanatorium facilities already there. A philanthropist in Shanghai donated his beautiful garden towards the establishment of a 150-bed sanatorium bringing the total bed capacity for tuberculosis in Shanghai to about 500. Anti-tuberculosis work in other parts of the country was stimulated after this conference. No official record of the number of sanatoria in China could be found, but it is estimated by the author to be about 40 with a total bed capacity of about 1,667 before the Japanese military started their devastating cam-

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paign in China. Computing on the basis of China's population, there was only one sanatorium bed available for the tuberculous per 235,000 people, as compared with one bed per 1,300 people in this country. One can readily see what a tremendous amount of money China would need to spend and the number of men and women to be trained before it would be possible to keep up with the United States in the efficiency of control of the disease.

Nevertheless, undaunted by the magnitude of the problem, the National Anti-Tuberculosis Association was established in China in 1933 for educating the public in the prevention of tuberculosis. The National Association published and circulated health posters and pamphlets, while local branches conducted clinics and hospitals for the tuberculous. It also endeavored to obtain government support for the establishment of large sanatoria, summer camps and preventoria, in various parts of the country for treatment and isolation of active cases. Unfortunately about that time Japan had already embarked on her imperialistic adventure in China, and this part of the program was never realized.

Although no new sanatoria were built between 1932-37, because of the inevitable war which started in 1937, public health work against tuberculosis never ceased. For example, in Shanghai, the Bureau of Education required compulsory X-ray examination for all students of public and private schools since 1936, preventorium and summer camp were started, measures were taken to tuberculin test all the school children below the age of fifteen, and work was begun in the factories to find active cases. In Chengtu (West China) the students of West China Union University were already being examined by the tuberculin test and X-ray, and a large tuberculosis clinic was maintained by the University Hospital. Unfortunately again, the spread of hostilities from one part of the country to another with all of its horrors and destructions forced the workers to devote themselves to the more urgent need of the wounded and homeless.

The Present Outlook

Many of the millions now in China driven from their homes by this ruthless war with inadequate food, clothing and shelter, if they do not die of starvation, cold and epidemic diseases, will become the prey of the much dreaded tubercle bacilli. The incidence as well as the death rate of the disease is bound to be high under such conditions, just as it was in Germany in 1918. Fortunately, however, we have men in China, who realize the importance of this serious problem. In Free China, for example, the Health Administration is taking strict precaution to find cases among the student population. The Shanghai International Settlement which with the influx of many hundred thousands of war refugees to the already over-crowded city, suddenly increased its population to about 2,000,000, is a very fertile soil for tuberculosis. What did the leaders do about it? In 1938 the Shanghai Anti-Tuberculosis Association was founded under the leadership of Dr. Alfred Sze, former Chinese Ambassador to Washington, and its first annual report is very illuminating. In a short period of twelve months the association has established two hospitals with 220 free beds, and of the 3,134 patients examined, 1,361 were admitted for treatment; 193 patients had pneumothorax successfully established, and 433 operations of various kinds were performed; 1,525 X-ray examinations were made. This work in no small measure contributes towards checking the spread of tuberculosis in Shanghai. It is interesting to note here the report of the Shanghai Municipal Council, which showed tuberculosis as the chief cause of death, but the death rate is 133 per 100,000 as compared with 244 as reported in 1932. This goes to show what can be done even under adverse conditions in the fight against tuberculosis. There is every reason to believe that as soon as peace reigns in China, a more organized and complete program for the control of tuberculosis will be carried out side by side with that of the reconstruction of the country. It is hoped in the very near future that medical science will advance new measures for the treatment of the disease so as to help eradicate tuberculosis from the world within the next two or three generations.

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Tuberculosis Control in Scandinavia*

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DURING the summer of 1939, it was the author's privilege to visit the Scandinavian countries and study tuberculosis control methods, particularly in Denmark. The purpose of the following remarks is to give a brief resume of the opinions of Scandinavian workers about some of the commonly accepted principles in the field of tuberculosis today.

In order to understand the various factors in the spread of an infectious disease such as tuberculosis in an European country, one should know something about the country itself, its people, and its historical background. Denmark, for example, the smallest of the three kingdoms in Scandinavia, has a population of approximately 3,700,000 people living on a peninsula and an archipelago of over 500 islands with a total land area of about 16,500 square miles. Some idea of the density of population may be obtained by comparing Denmark with Minnesota which state has a population of only 2,600,000 people in an area of over 84,000 square miles. The density of the population varies greatly, with more people on the fertile islands than on the sandy and less fertile lands of Jutland. About 1,000,000 of the people are concentrated in the capital, Copenhagen, where the only medical school in the country is located, and where also may be found the famous State Serum Institute, the center of all medical facilities and investigations in Denmark.

The Danish people are of the Goth-Germanic race which inhabited the country even in prehistoric times. Their language is universally Danish although English is spoken quite commonly. Only about three per cent of the residents are foreigners, and the native population is rather stable. Farming and dairying are the principal occupations of these industrious and well-educated people who mix these two industries with scientific skill. Driving through the countryside of Denmark, one is reminded strongly of the rolling farmlands of Wisconsin and Minnesota.

It is understandable how one might compare medical care or tuberculosis control in Denmark with that of Minnesota, but certainly not that of Denmark and the United States as a whole. It is easy to see how state medicine can be highly successful in Denmark, but hard to imagine attempting the same plan in a country so totally different in its size, people, industries and history as ours.

The type of medical care available in Denmark has had great influence upon the development of a program for tuberculosis control, and organized medical care by the state must receive considerable credit for a reduction in the annual death rate from tuberculosis from a rate of nearly 200 per 100,000 persons in 1900 to the lowest rate of any European country in 1937 of only 44 per 100,000 population. According to Dr. Thorvald Madsen, director of the state serum institute, tuberculosis has been widespread in Denmark for several centuries because of good means of communication, its small size, and dense population—all of which are favorable to the spread of the disease—and only in the last decades has the disease decreased rapidly.

In Norway and Sweden, where early means of transportation were poor and distances of travel great between widely scattered groups of people, there was relatively little disease until increased communication facilities have distributed tuberculosis all over the country with rising death rates until fairly recently. The annual tuberculosis death rate in Norway in 1936 was 102 per 100,000, and in Sweden in 1937 it was 86 per 100,000 population.

In some of the poorer areas in the north of Sweden, Neander found a particularly high mortality rate during the period of 1911 to 1925. In his classical investigation in Norbotten he found the mortality from tuberculosis was 37 per cent of the total mortality of that area.

It is noteworthy that Denmark was the first country to wage a systematic war against tuberculosis in cattle based upon the fundamental work of Bang who used tuberculin for diagnostic purposes, and even in the nineties, bills were passed for combating the disease in cattle. The Danish tuberculosis acts were passed in 1905 showing marked public interest in the control of the disease, and laying stress on the establishment and maintenance by the state of institutions for the care of the tuberculous.

From 1905 until 1933, all medical care for tuberculosis patients was free to persons earning less than 4,200 Danish kroners a year ($800-900). This gave great impetus to early hospitalization of diagnosed cases. The question of cost of care was completely settled in 1913 with passage of the Acts of Social Care which decreed that all persons over 15 years of age must be members of a sick benefit club, which entitles them to doctors' and hospitals' services for any illness without cost.

Under these acts, even the family is given financial aid while the head of the household is receiving sanatorium treatment to arrest his tuberculosis. In addition, after discharge of the patient, full maintenance for the entire group continues for a definite period in order to allow accommodation of the patient and his family to the new and frequently modified way of living. Strict regulations have been set up and are enforced regarding the examination of school teachers, state and municipal employees, food and milk handlers. If teachers are found to have tuberculosis, they are dismissed on a pension of two-thirds of their former salary, which provides for their future welfare and consequently avoids the temptation to hide the dangerous ailment.

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As Madsen has pointed out, the main principle of tuberculosis control has been the eradication of massive sources of infection from man, and easy access to institutional treatment for open tuberculous cases when found. The group of tuberculosis specialists working at the State Serum Institute and the Central Station for Tuberculosis Control in Copenhagen have performed skillful and productive research on many of the fundamental problems of tuberculous control. Madsen, the director, Jensen, the head of the tuberculosis laboratory, and Holm, the clinician and epidemiologist, working in close collaboration have developed procedures worthy of detailed explanation especially in the fields of early diagnosis and aftercare, which, together with adequate hospitalization, make up the triad *sine qua non* in tuberculosis control in any country.

The views described here are entirely those of the physicians just mentioned as expressed to the author during a period of study and observation in the clinics and State Serum Institute in Copenhagen.

Tuberculin-testing and X-ray examination of positive reactors are the principal means of early diagnosis used in Denmark. All tuberculin used for testing is prepared and diluted ready for use at the State Serum Institute under the personal supervision of Jensen, and sent out by mail to all clinics and doctors throughout the country. Jensen uses a buffer and quinasol instead of saline and phenol for a diluent and preservative respectively because he feels his dilute solutions stay stable for one to two months while saline with phenol solutions lose half their strength in 30 days.

Old tuberculin was used from 1926 to 1935, and since then Purified Protein Derivative standardized on man has been prepared and advocated for routine intracutaneous skin testing. If the first dose of 1/50,000 mg. is negative, a second dose of 1/500 mg. is recommended. This second dose according to Jensen is about equal to 1 mg. of his standard old tuberculin. He feels that the first dose should pick up about two-thirds of the reactors, and the second dose all the rest without too severe a reaction. Holm says if material is properly standardized and applied, and the reaction to it interpreted correctly, the presence of allergy to tubercle bacilli can be determined exactly. Reactions are read at the end of 72 hours (usually 48 hours in this country), and must be 10 millimeters in diameter to be considered positive.

Holm feels that the Von Pirquet method of tuberculin testing is not as good as the Mantoux test, especially in persons over 12 years of age. Heimbeck in Oslo, Norway, uses only the Von Pirquet technique as do many of the men in Norway, because in their hands, this technique is simpler to use, and in their opinion, almost as reliable as the Mantoux test. Holm and his co-workers have the weight of evidence in favor of the intracutaneous method.

The sedimentation rate determination (Westergren method) has not proved to be of value in diagnosis of new cases among children, although it is used extensively in follow-up of known cases of tuberculosis in children and adults.

Some of the population studies with tuberculin testing are interesting. In different parts of Denmark the percentage of positive reactors varies greatly although the crude death rates from tuberculosis are about the same. On one island where there is no bovine tuberculosis, the incidence of positive reactors among children is about 10 per cent; in another area with much bovine tuberculosis, there are 50 to 75 per cent positive reactors. Apparently high levels of positive reactions to tuberculin and bovine tuberculosis are correlated. Jensen has found that children from areas of high incidence of bovine tuberculosis who have positive stomach washings show the bovine type of tubercle bacilli on culture and guinea pig inoculation. Another interesting finding of Holm's annual tuberculin testing of hundreds of school children is that the annual infection rate is high where the bovine tuberculosis rate is high, and low where the bovine tuberculosis rate is low or in towns where there is milk control.

This question of bovine infection of humans has been studied in great detail by Jensen and Holm. All specimens sent in for diagnosis go to the control laboratory at the State Serum Institute, and organisms found are typed not only as to pathogenicity or non-pathogenicity, but also as to human, bovine or other strains. Several cases have been found in which both human and bovine strains were demonstrated in the same individual at one time.

Extensive investigations have been carried on showing the distribution of types of tubercle bacilli by types of disease caused. For example, in the western and southern part of the mainland, in the age group 0-15 years, tuberculous meningitis is of bovine origin in 70 per cent of the cases as compared to 18 per cent in similar age groups in the city of Copenhagen. The bovine type of tubercle bacilli causes 80 per cent of the tuberculosis in cervical lymph glands all over the country. On the mainland even pulmonary tuberculosis is of bovine origin in 30 per cent of the cases under 15 years, and 17 per cent of those 15 to 30 years of age.

Annual reversion rates have been determined also by Holm who finds that in a group of children 7 to 14 years old tested with the same dose three years after the first test in an area with a high bovine tuberculosis rate, the annual reversion rate was less than one-half of one per cent, while in a similar group of children where no bovine infection in cattle was present, the annual reversion rate was about four per cent.

One of the many controversial questions concerning tuberculosis today is the fate of the tuberculin positive reactor as compared with the tuberculin negative child. Which one is better under the same conditions? Holm and his co-workers are firmly of the opinion, on the basis of their extensive investigations, that the person who is negative to tuberculin, whose reaction becomes positive, has many more times the risk of getting serious tuberculosis during the 12 to 18 months following his infection than the person who has shown a positive reaction for a year or more.

Three of the Danish studies are reported briefly here to bring out the attitude of these workers that the interval of 1 to 18 months after a person with a negative

reaction to tuberculin becomes positive is the decisive period for subsequent development of clinical tuberculosis.

First, is the study of the apprentices in a boarding home in Copenhagen where tuberculin testing and X-raying of positive reactors was done yearly. Among 110 males, ages 16 to 22 years, in one home, in 1935, there were 80 boys with positive and 30 boys with negative tuberculin tests. In the 1936 examinations, one of the boys with a previously positive tuberculin test was found to have open tuberculosis, and among the 30 boys with previously negative tuberculin tests, one had died of tuberculosis and four more had clinical tuberculosis in need of treatment.

The second study was conducted among the 10,000 people in the island town of Rønne where there is no bovine tuberculosis. Yearly examinations are made of 3,000 individuals 15 to 35 years of age. Over a period of time, among 1,500 tuberculin-positive persons with negative X-rays only one case of clinical tuberculosis developed (a brother with open tuberculosis was living in the house). Among 1,500 tuberculin-negative persons, 68 became tuberculin-positive and seven of these had a lesion requiring treatment. Three of the seven were open cases.

Holm's third study is of particular interest to physicians because it was done among 1,500 medical students who had follow-up examinations over a period of three years. Of the 1,000 positive reactors on first examination, none broke down with tuberculosis in three years. Among the negative reactors on initial examination, 81 students became positive reactors during the three years; 19 of these had evidence of active pulmonary tuberculosis, and three of them have died. Many of the 19 cases had virulent organisms in their stomach washings.

Examination of stomach washings for virulent tubercle bacilli is done more frequently in the clinics and hospitals in Denmark than in this country. In small children who cannot expectorate and in adults who have pulmonary lesions and do not expectorate, this method is of value in diagnosis, and also in the determination of activity of foci of infection in the lungs. Great care is exercised in obtaining the stomach specimen properly and in laboratory cultivation of any acid-fast organisms found. All specimens come to the State Serum Institute laboratory where meticulously careful culture work is performed under the rigid Jensen technic.

Studies have been made to determine whether or not the school children with positive stomach washings are infectious to others in their class. No increase in positive reactors to tuberculin occurred above that expected in previously negative reactors in several schools where the pupils were tested annually.

In the Central Tuberculosis Station (similar to outpatient clinics in this country) in Copenhagen, and in other tuberculosis control stations throughout the country, the fluoroscopic X-ray examination is used routinely to good advantage in addition to the usual flat plate of the chest. In the station, the clinician fluoroscopes all new patients as a part of his initial examination, and if any shadows in the lungs are observed, a flat plate of the chest is made for a permanent record and also to check the fluoroscopic findings. Then, on follow-up examination, the fluoroscopic examination is used, thus saving the time and expense of celluloid plates each time. At prolonged intervals, however, regular chest plates are taken for determination of progress of each patient with a lesion. Paper plates are used very little in Denmark.

Recently Holm has been experimenting with and developing the use of 35 millimeter films for the purpose of photographing the fluorescent image of the lungs on the fluoroscopic screen. Some excellent films have been produced by this method at an approximate cost of one cent per film. These films must be projected either by a hand lens or a regular light projector for interpretation. This is one of the objections to their widespread use. However, little difficulty was experienced in picking out characteristic, moderately or far-advanced, tuberculous lesions in the lungs with these films. Certainly among insane persons in state institutions, such a screening process would be within the realm of possibility (economically), and if all the advanced tuberculous patients could be identified, studied medically, and segregated, one would not be too concerned about the minimal cases which might have been missed. Regular X-ray plates, tuberculin tests, and other laboratory procedures could be done on all patients with parenchymal shadows found on the small film.

Tuberculosis workers in South America, Germany, Norway, Sweden, and England are using these small films for diagnostic purposes extensively. The next few years will undoubtedly bring forth many reports on large population groups, about which reliable conclusions can be drawn regarding the efficacy of the small film in case-finding. Preliminary investigations with the small film were made in the fall of 1939 among various persons in state institutions in Minnesota by the Division of Public Health Methods of the United States Public Health Service in coöperation with the Minnesota Department of Social Security. Further reports on its use will be forthcoming shortly from these two groups.

Another subject of international interest in the field of tuberculosis concerns the safety and effectiveness of vaccination against tuberculosis with living tubercle bacilli of the Calmette-Guérin type. When this method of vaccination was recommended by Calmette and Guérin it encountered wide-spread and severe criticism, even before the unfortunate Lubeck affair. Under the auspices of the Health Organization of the League of Nations, a conference of leading tuberculosis specialists was held at the Pasteur Institute, and after thorough discussion, a report was adopted stating that B.C.G. correctly prepared could be used without any risk. Since that time, B.C.G. vaccination has been performed in many European countries, especially the Scandinavian ones. Heimbeck uses B.C.G. on nurses in training in the hospitals in Oslo who react negatively to tuberculin; Wallgren uses it on new-borns and young children in Gothenburg; Kjellin employs B.C.G. routinely in young children who are negative reactors who come from tuberculous families in the city clinics of Stockholm; Holm

gives B.C.G. regularly to new-borns and small children who come to the tuberculosis clinic in Copenhagen for care. All of these men have great respect for the organisms with which they are dealing, are very careful as to which children receive the vaccine, and supervise vaccinated children closely for at least six weeks after injection or until the children develop a positive reaction to the tuberculin. All of these tuberculosis experts are in favor of B.C.G. vaccination on the basis of their clinical impressions that the vaccinated youngsters have less possibility of getting active tuberculosis than the unvaccinated group. Yet, none of these investigators has demonstrated in a definitive manner, with valid statistics, that B.C.G. vaccination prevents tuberculosis. Until such proof is presented, our attitude toward this procedure must remain scientifically reserved.

The experimental work of Jensen and his co-workers on B.C.G. vaccination in animals was used as the basis of B.C.G. vaccination of children in Denmark. Guinea pigs were injected by inhalation of suspensions of virulent cultures of tubercle bacilli; some animals were and others were not previously vaccinated with B.C.G.

In the vaccinated animals with positive tuberculin tests, strong cellular reactions appeared around the individual tubercle bacillus in the lungs within a few days and the tubercle bacilli did not multiply. In the non-vaccinated controls, the organisms multiplied rapidly up to eight days after inhalation, and no cellular reaction was present. An allergic cellular reaction appeared after nine days, but there were in place of each original tubercle bacillus, 200 to 300 new bacilli. Jensen felt that the tubercle bacilli were fixed at the portal of entry in the vaccinated animals, and that these animals showed a strong tendency to heal, while the non-vaccinated animals tended to develop progressively worse disease.

Jensen, personally, prepares all B.C.G. vaccine used in the stations for tuberculosis control in Denmark. Each time a new vaccine is prepared, control injections are made in guinea pigs before the vaccine is used on children. Each time the vaccine is used on children, a report on the size of nodule produced by the intracutaneous injection of 0.1 mg. of B.C.G. is sent to Jensen, so that the stability of the cultures may be maintained at a certain level. No untoward local or general reactions have occurred among the vaccinated group under this carefully controlled regime. As Madsen says, they are attempting to make the infection of persons with tubercle bacilli protective rather than destructive. It will be vitally interesting in the future to see how well they succeed.

It is not necessary to discuss the second phase of tuberculosis control, adequate hospitalization facilities, because these are so well provided in Denmark under the Tuberculosis Acts. Not only are there hospitals and sanatoria, but also rest homes, seaside resorts, special hospitals for bone and joint and glandular tuberculosis such as the Finsen Institute, and many recreational and convalescent homes.

The third phase, aftercare and rehabilitation, is given proper emphasis and importance in Denmark to a much larger extent than in any state in our country even though our resources are immeasurably greater.

The Danish Social Care Acts provide for invalidism of all persons over 15 years of age, and tuberculosis is rightfully considered an invaliding disease. By providing financial assistance to the tuberculous patient discharged from the sanatorium, aftercare and rehabilitation may go on even to the extent of part-time remunerative work for a period of time sufficient to determine chances of permanent recovery and self-support. What is to be gained if the tuberculous member of society is diagnosed early and given adequate sanatorium care to arrest his disease, and then placed unceremoniously in an unfriendly world where chances of self-sufficiency are slight and of breakdown great because of physical frailty and economic instability. Denmark has learned that little is to be gained unless the three parts of the control program are given equal importance.

The Tuberculosis Acts provide for financial assistance in the establishment and maintenance of tuberculosis stations. As a result, stations have been established in various areas in the country to assist the general practitioners in the diagnosis of potential cases of tuberculosis and the follow-up of known cases. Expert consultants, excellent X-ray equipment, and laboratory facilities, otherwise unavailable, are provided free for all patients in need of care.

It is a real pleasure to follow an ordinary citizen of Copenhagen into the Central Station for Tuberculosis Control, where, first of all, an exact diagnosis is made of the presence and extent of his tuberculous condition; next, arrangements are made for his hospitalization, and soon the district nurse goes out to visit the home to see that the other members of the family do not suffer, because the bread-winner was unfortunate enough to contract tuberculosis, and to make plans for examination of all contacts. Before the patient is discharged from the sanatorium, arrangements are made for medical follow-up in the clinic when the patient is able, finally, to return home. When the patient and his family come to the clinic for the first post-sanatorium visit, all details regarding financial assistance, rehabilitation, and aftercare are settled, and a definite program for each family is outlined. By close coöperation, the clinician, the public health nurse, and the public assistance workers continue supervision of this integral unit in the community, the family. This is just a small sample of the famous Scandinavian coöperative spirit, which, in Copenhagen, has given the public the assurance against tuberculous infection and disease which comes with the smallest annual death rate from tuberculosis of any capital in Europe today.

An Investigation into the Occurrence of Bovine Pulmonary Tuberculosis in Man in the South of Sweden

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ONE of the most joyful events of our days is that the social disease tuberculosis, which has for a long time ravaged all over the world, at present seems to be rapidly on the decline in most civilized countries. That is also the case in Sweden. The tuberculous mortality is decreasing there year after year. Thus the death rate from tuberculosis (of all forms) has fallen from 191 per 100,000 in 1911 to 102 in 1934 and according to the last report published in 1938 it was 81 per 100,000. Not only the *mortality rate* but also the *morbidity rate* has undoubtedly decreased. How great this decrease in morbidity is cannot, however, be recorded exactly at present.

Anti-tuberculosis work in Sweden has thus met with a degree of success. The fight against tuberculosis in Sweden has therefore by no means diminished in intensity, on the contrary the campaign against the disease has in recent years been carried on with still greater energy. A new dispensary law passed in 1937 and a new tuberculosis law in 1939 afford new means and facilities of an activity in anti-tuberculosis work not found previously.

As a result of this intensified campaign against tuberculosis greater interest has been aroused in the importance of infection with bovine bacilli. Measures had previously been introduced to prevent infection by milk from tuberculous cows. But it was then generally supposed that infection with bovine bacilli gave rise to almost exclusively extrapulmonary tuberculosis. Since recent investigations, especially those performed in Denmark by K. A. Jensen, have conclusively proved that even pulmonary tuberculosis may not infrequently arise as the result of an infection with the bovine tubercle bacillus, the interest in this problem has greatly increased. One wished to ascertain whether conditions in Sweden were similar to those in Denmark and, if so, to carry on a still more intensive campaign against the source of bovine infection.

In Fig. 1, K. A. Jensen has recorded the results over a period of three to three and one-half years of altogether 3,000 typings of tubercle bacilli from specimens sent in from various parts of Denmark. The material was classified partly according to the nature of the specimen and partly according to the patient's age and domicile. A refers to the Danish islands, with the exception of the city of Copenhagen, which city is represented by special figures, B denotes eastern and northern Jutland and C western and southern Jutland. Thus B and C correspond to the western districts of Denmark, where tuberculosis is very common among the cattle. A and B denote human and bovine tuberculous cases respectively. The percentage of bovine tuberculosis (%B) refers of course to the number of bovine strains found in the specimens sent in. As these are only random specimens and thus do not represent *all* cases of tuberculosis, the percentage is not at all an expression of the incidence of bovine tuberculosis in Denmark, but the figures nevertheless furnish valuable information.

If we examine the cases of pulmonary tuberculosis, we are at once struck by the high frequency of those of bovine origin. Such strains were exceedingly often met with in western and southern Jutland (C), a circumstance we also note in the other groups of the material examined. That bovine tubercle bacilli frequently cause tuberculosis of bones and joints and of the urogenital organs, meningitis and extremely often cervical gland tuberculosis is also evident from the table.

These figures are so startling that there is no wonder that plans were soon made to find out whether the same conditions prevailed in the southernmost part of Sweden (the Province of Skane), which is situated in the same latitude as Denmark and where tuberculosis of cattle is also widespread. Consequently, an investigation into the occurrence of bovine tuberculosis in man, especially pulmonary tuberculosis, was started in 1936. This investigation, covering a period of about three years, was made by me in collaboration with Prof. A. Lindau and Prof. H. Magnusson. According to the plan drawn up, Lindau did the typing of the tubercle bacilli found in the specimens sent in; I examined the clinical features, while Magnusson was responsible for the veterinary side of the investigation. The technique of typing employed was the following:

Sputum, stomach washing, pus and pleural fluid: The specimens were centrifugalized for 20 minutes; the sediment was then mixed with a sufficient quantity of 4 per cent NaOH to make up the volume of 10 cc., after which the mixture was kept in a thermostat for half an hour. During this time the mixtures were taken out now and again and shaken thoroughly. Then the mixtures were centrifugalized once more. Sterile physiological saline solution and one or two drops of 2/n HCL were now added to the sediment so that the new mixture would react fairly neutrally. The seeding was then made with the aid of a Pasteur pipette direct into test-tubes containing Löwenstein's medium. As a rule four test-tubes were inoculated in each case.

If the sediment obtained after the first centrifugalization was uniform and well dissolved, another method was advantageously employed, which was also adopted in the examination of *urine*.

FIG. 1.

The Frequency of Human and Bovine Tubercle Bacilli in Specimens Obtained from Various Parts of Denmark According to K. A. Jensen

	0-15 Years			15-30 Years			30 Years		
	H	B	Pct. B	H	B	Pct. B	H	B	Pct. B
a. Pulmonary Tuberculosis (3 years' material)									
Copenhagen	311	21	6.3%	448	9	2.0	153	0	0.0
A	40	0	0.0	188	5	2.6	97	1	1.0
B	27	2	6.9	148	9	5.7	43	2	4.4
C	15	6	28.6	133	27	16.9	83	6	6.7
b. Bone and Joint and Urogenital Tuberculosis (3 years' material)									
Copenhagen	14	2	12.5	45	5	10.0	29	1	3.3
A	21	1	4.5	45	5	10.0	50	4	7.4
B	23	10	33.3	77	22	22.2	85	12	12.4
C	16	11	40.7	31	25	44.6	26	7	21.2
c. Cervical Gland Tuberculosis (3 years' material)									
Copenhagen	6	22	78.6	17	14	45.2	19	2	9.5
A	1	7	87.5	7	3	30.0	16	0	0.0
B	3	13	81.3	14	15	51.7	13	3	18.8
C	4	24	85.7	12	15	55.6	15	5	23.8
d. Tuberculous Meningitis ($3\frac{1}{2}$ years' material)									
Copenhagen	69	15	17.9	28	0	0.0	11	2	15.4?
A	13	6	31.6	14	3	17.7	11	0	0.0
B	27	18	40.0	28	7	20.0	6	0	0.0
C	9	19	67.9	9	3	25.0	4	2	33.3?
Aalborg County	6	10	62.5	4	1	?	1	0	?

Instead of NaOH, a sufficient quantity of 6 per cent H_2SO_1 was added to the sediment to bring the volume up to 2 cc. This mixture was then kept at room temperature for 10 minutes, and often shaken thoroughly. Physiological saline solution was then added and the mixture centrifugalized once more. Before being finally planted into the Löwenstein test-tubes, one drop of a 4 per cent sodium hydroxide was added to the sediment.

The colonies which grew after some weeks were as a rule of such a characteristic appearance that it was possible even macroscopically to determine to a certain extent whether the strains of tubercle bacilli were human or bovine, for the human strain grows on Löwenstein medium in the form of luxuriant, dry, rough, irregular and opaque colonies with abundant yellow pigment. The colonies are also difficult to break up and to emulsify. In contradistinction to this, the bovine strain grows more slowly on the Löwenstein medium, small, round, moist, almost transparent colonies appearing, which are easy to rub out.

In all cases in which the mode of growth indicated the presence of a bovine or suspected bovine strain of tubercle bacilli, the observation was always controlled by tests on rabbits. It should be emphasized that there is no doubt whatsoever as regards the etiology of the cases of bovine tuberculosis in man that I shall shortly describe. Even when different material from one and the same person was examined and typed on different occasions, only bovine tubercle bacilli were found.

One by one, as the cases of bovine tuberculosis were discovered, the infected person's family was examined and an investigation was made as to how the infection by bovine tubercle bacilli had occurred. A veterinary investigation was carried out in all those cases in which there were prospects of obtaining a positive result. Sometimes the source of infection was discovered immediately and eradicated. Usually they were then such forms of the disease (in man) as arise in direct association with or shortly after the primary bovine infection. Most frequently, however, the source of infection was very difficult to establish for certain, as the changes—when detected—were not quite recent, and the infected person had not infrequently changed his employment several times. But remarkably often there was a past history of contact with cows affected with tuberculosis.

Altogether about 3,300 specimens sent in have been examined. Tubercle bacilli were found in 746. Of these 65 were bovine.* The bovine tuberculous cases discovered can be regarded as a fairly exact expression of the incidence of bovine tuberculosis among the population of the Province of Skane only in so far as pulmonary tuberculosis is concerned. The reason for this is that only the cases of pulmonary tuberculosis have been investigated thoroughly. Specimens of sputum from *all* known cases of pulmonary tuberculosis were sent in for examination, not only those being nursed at sanatoria, tuber-

*If groups 1, 2 and 10 (Fig. 3) are taken together, bovine tubercle bacilli were found in 29 per cent of the pulmonary cases examined.

FIG. 2.

Age	Cases	Age	Cases	Age	Cases
			C/f 22		C/f 47
7 months	1	17 years	2	29 years	2
10 months	1	18 years	3	30 years	2
1 year	3	19 years	2	31 years	1
3 years	1	20 years	2	32 years	1
4 years	3	21 years	2	34 years	2
5 years	1	22 years	1	37 years	1
6 years	3	23 years	4	40 years	2
7 years	3	24 years	3	41 years	2
10 years	1	25 years	3	47 years	1
12 years	1	26 years	1	52 years	1
14 years	2	28 years	2	62 years	1
16 years	2			68 years	2
	22		47		65

culosis hospitals or care institutions for tuberculous patients but also from those living at home. Other specimens, on the other hand, were examined to the extent they were sent in, but no pressure was exerted to compel a more general investigation of the occurrence of glandular tuberculosis, meningitis, renal tuberculosis, etc.

Of the 65 cases, 32 were males and 33 females. Thus no essential difference could be shown in the distribution between the sexes. The age at which the first symptoms of disease appeared or—in the absence of symptoms—when the disease was diagnosed varied considerably (from 7 months to 68 years). (Fig. 2.)

FIG. 3

Group	Cases
1. No demonstrable changes, but bovine tubercle bacilli found in the stomach washing	1
2. Hilar or pulmonary changes arising in connection with or shortly after a primary infection	10
3. Miliary tuberculosis	2
4. Tuberculous meningitis	1
5. Tuberculous pleurisy	3
6. Tuberculous peritonitis	2
7. Extrathoracic gland tuberculosis	6
8. Bone tuberculosis	4
9. Renal tuberculosis	8
10. Pulmonary tuberculosis	28

In the majority of cases the patients were farmers, tenant farmers, crofters, farm labourers, milkmen (their wives or children), that is, persons who must be considered to be more exposed than others to the risk of bovine infection.

I have divided the 65 cases, according to the nature and localization of the changes, into 10 different groups. For an account of bovine pulmonary tuberculosis in man, groups 1, 2 and 10 are of the greatest importance and I shall now give a short description of some typical cases, mostly for the purpose of exemplifying the origin of the infection and the nature of the tuberculous changes. (Fig. 3.)

In Group 1, I have included a girl, aged 4 years, whose mother was found to have small parenchymal changes at one apex. These changes were undoubtedly of tuberculous origin but the process has remained stationary and non-bacillary for quite a long time. The daughter was examined on account of the mother's condition. The child gave a positive tuberculin reaction and showed a normal lung radiogram. Bovine tubercle bacilli were demonstrated in the stomach washing.

How the infection occurred in this case is not clear. The father, who is a farm labourer, has in the last few years been employed at various farms where the herds were said to be reactors and had not been clinically examined. It is possible that the family was infected with the bovine bacillus at one of these farms, but the more plausible explanation, of course, is that the mother had transmitted the infection to the daughter.

Group 2 comprises ten cases, all of them with hilar or pulmonary changes appearing at the same time as or shortly after the primary infection. Thus, none of these cases had in the beginning what is colloquially called pulmonary tuberculosis. In most of the cases the source of infection has been established with a high degree of certainty.

Three of the ten cases were children of the same family, aged 7, 10 and 11 years respectively. In May 1938, the father, who has a small farm, bought a cow, which had to be slaughtered already in August of the same year; the postmortem examination revealed "advanced acute tuberculosis of the lungs, kidneys, udder and serous glands, as well as extensive tuberculosis of the uterus." Milk from this cow had been used in the household. In June-July 1938, i. e. at a time when an immediately occurring primary infection might be expected to manifest symptoms of the disease, six of the seven children of the family fell ill. Only the youngest child, aged 7 months, who had been fed on mother's milk or boiled cow's milk, remained unaffected. On examination this child was also found to be tuberculin negative and to have a normal lung radiogram. All the other children, on the contrary, gave positive reactions and presented to some extent a very similar picture of disease. The three children mentioned above, aged 7, 10 and 11 years respectively, developed, however, in addition to the more general symptoms of disease, *erythema nodosum* and an *extensive hilar adenitis*. One of them also had later a *left-sided apical change*, probably due partly to atelectasis. In two of the cases tubercle bacilli were found in the sputum and the stomach washings but in the third case the organisms were demonstrated only in the stomach washing. In all probability the other three children of the family, in which no tubercle bacilli could be demonstrated, had also been infected by the bovine bacillus.

Of the other eight cases belonging to Group 2, one is of special interest, as it is also one of a family, several members of which were probably infected with the bovine bacillus at the same time.

The father, a farm labourer, has been an employee at the same farm for several years. In March 1937 a cow affected with tuberculosis had to be slaughtered. At about the same time three of the children, aged 7, 15 and 17 years respectively, developed *erythema nodosum*. The two youngest also had a pronounced *hilar adenitis*. Bovine tubercle bacilli, however, could be demonstrated only in the 15-year-old child (in the stomach washing). The other children of the family, as well as the parents, remained unaffected.

The following case is of very special interest, since, as far as can be judged, the bovine infection was transmitted from man to man.

The patient is a girl, aged 7 years, who had not been away from home for more than one day at most. The father has a small farm with a herd of three cows. According to Professor Magnusson's report, it appears that at the time of examination the animals were in good general condition and that "probably none of them had open tuberculosis at the time when the patient can be calculated to have been infected." An elder sister, now married, had previously been employed as a domestic servant at various places. According to her past history, she had erythema nodosum in 1934. Four years later, in June 1938, she was found to have a cavernous phthisis and abundant bovine tubercle bacilli were demonstrated in the sputum. The danger of infection to the surroundings may be gathered from the fact that in July 1938 her husband had a troublesome exudative pleurisy and that two of the five previously nonreactive cows became reactors.

Our patient had been in contact with this sister. In July 1938 she had erythema nodosum. An X-ray examination revealed the presence of a primary lesion with enlarged glands in the hila and the mediastinum and a small change of a tuberculous nature in the left lung. Bovine tubercle bacilli could be found in the stomach washings. The changes have since reduced again and her present general condition must be characterized as satisfactory.

Here on the one hand we have a patient with bilateral cavernous phthisis and abundant bovine bacilli in sputum and on the other hand her sister with a primary lesion and bovine tubercle bacilli demonstrable in the stomach washing. Since bovine infection from cattle can in this case be excluded, the infection was in all probability transmitted by the older patient to her younger sister.

In the next case the source of infection seems to have been quite different.

The patient, who is a 27-year-old native of Skane, is studying at the Veterinary College in Stockholm. Both in his practical work and at the laboratory he came into contact with bovine tuberculosis. In May 1937 he developed *erythema nodosum*. An X-ray examination of the lungs made on that occasion revealed the presence of a right-sided primary lesion, which showed a very slow reduction. Abundant tubercle bacilli, which on typing proved to be bovine, were found in the sputum.

The next case belonging to Group 2 is that of an unmarried woman, aged 37, the daughter of a small farmer. In the autumn of 1935 a cow was slaughtered, which was said to be "full of tuberculosis." According to information supplied, the animal had been ill for quite a long time before it was killed. In April 1935 the patient became ill with fatigue, wasting, a dry cough and fever. An X-ray examination made in June of the same year revealed the presence of a *primary lesion*. The lymph glands of the left hilum and of the mediastinum were considerably enlarged. In the centre and posterior part of the left upper lobe there was an area of condensation as large as the palm of a man's hand (the lung component of the primary lesion). The process soon showed every sign of a serious development. The glands of the mediastinum increased in size. The lung change underwent liquefaction, and pneumothorax treatment had to be instituted. This had to be discontinued almost immediately, however, owing to a bilateral exudative pleurisy, which gave rise to a severe dyspnea. The general condition then deteriorated rapidly and the patient died in June 1936. Postmortem examination showed the presence of a caseous primary lesion in the left lung and tuberculous nodules in the hilar region and in the mediastinum, besides a fresh, exudative pleurisy in the right side and a pneumonic focus, as large as a plum, with a central breaking down of the tissues of the right lung.

Group 10 contains no less than 28 cases of *bovine pulmonary tuberculosis* in man, a remarkably large number. The cases showed themselves to be often extremely malignant, rapidly progressive and not infrequently—in spite of all therapy—the course was fatal within a longer or shorter time. In general they were infections and were therefore a considerable danger to their surroundings, both human beings and animals. As a rule the source of infection could not be discovered. Only a few case histories may be cited.

One of the cases was that of a girl, aged 17 years, the daughter of a farmer. On the farm there were seven cows, which in a clinical examination were found to be healthy. In 1935 a brother of the patient, 21 years of age, died from pulmonary tuberculosis (bilateral tuberculous changes, tubercle bacilli being found in the sputum). The bacilli were not typed, however, as the investigation had not been started at that time. In the same year a sister also developed a typical primary lesion in the lungs. No tubercle bacilli could, however, be demonstrated in this case. In January 1937 the patient developed tuberculosis of the knee joint. Fluid from the joint contained bovine tubercle bacilli. An X-ray examination revealed several very large spots in the centre of the left lung (parenchymal changes), which underwent regression later. Guinea-pig tests with sputum and stomach washing gave negative results.

How the infection took place in this case cannot at present be ascertained. There are strong suspicions, however, that the brother who died in 1935 had bovine tuberculosis and had infected both his sisters, one of whom developed a primary lesion and the other tuberculosis of the knee joint and pulmonary tuberculosis. *Thus there is a possibility also in this case that the bovine infection was transmitted from man to man.*

Another case was that of a farmer 68 years of age, who until 15 years ago had been a stone-cutter but had since then kept a small farm. In 1937 the patient felt tired, lost about 25 lbs. in weight and had an excessive thirst. In July 1938 diabetes was diagnosed, for which the patient was admitted to the hospital. An X-ray examination revealed the presence of small, cloudy, parenchymal changes in the centre of both lungs, but no cavity. Bovine tubercle bacilli were found in the sputum. The patient's present condition is very poor.

A noteworthy feature in this case is that the bovine tuberculosis did not appear until the age of 68 years. No radiological signs of a previous tuberculous infection could be shown (even in radiograms of the abdomen).

The next case is that of a 17-year-old farm labourer.

The farm live-stock consists of 12 to 14 cows and 30 pigs. In 1933 two pigs were slaughtered and in 1934 a cow was killed owing to their being affected with tuberculosis. In April 1937 the patient had hemoptysis. An X-ray examination revealed the presence of a very extensive bilateral *pulmonary tuberculosis* with a cavity on a level with the second left intercostal space. Bovine tubercle bacilli were found in the sputum. Pneumothorax treatment was begun in May 1937 and is still being continued. The general condition is strikingly good.

A typically malignant course was illustrated by the following case.

The patient was a woman, aged 24, the wife of a farm labourer. Ever since the age of 15 she had been employed in different places as a milkmaid. She was married in 1933 but participated in milking even after getting married, and milked only three weeks before admission to hospital in January 1936. An X-ray examination then showed the presence of an extensive bilateral *pulmonary tuberculosis* with an area of liquefaction, the size of a mandarin orange, in the left apical field. Abundant bovine tubercle bacilli were found in the sputum. The condition gradually deteriorated and the patient died in September 1936 after a hemoptysis.

The disease ran a similar course in the following case.

The patient was a 21-year-old dressmaker, the daughter of a farmer. *Pulmonary tuberculosis* was diagnosed in June 1935 (spotty parenchymal consolidation in the entire left lung and upper part of the right lung, together with a cavity, the size of a large bean, in the right first intercostal space.) After one

month an egg-sized cavity had developed in the left apex. Abundant bovine tubercle bacilli were demonstrated in the sputum. Left-sided pneumothorax treatment and partial cauterization of adhesions brought about no improvement. The cavity in the left lung continued to grow, so that a perforation into the pleura was feared. In March 1936 a right-sided renal tuberculosis was diagnosed, which led to nephrectomy. The condition became still worse and the patient died in March 1937.

A very large number of bovine tuberculous cases, especially pulmonary tuberculosis, have been discovered among the population of the southernmost part of Sweden. The disease is very common in the western and southern districts of the Province of Skane, corresponding to the county of Malmöhus where tuberculosis of cattle is more common than in the county of Kristianstad, which is mostly woodland, while the county of Malmöhus is a fertile lowland. The bovine bacilli usually enter the human body via the intestinal canal, but—as appears from the cases belonging to Group 2,—they may also, and indeed surprisingly often, be inhaled and give rise to the primary lesion in the lung. The correctness of this assertion is corroborated not only by roentgenological evidence but also by the necropsy findings in one case. This observation is of vital importance in the fight against tuberculosis. It is no longer sufficient to combat bovine infection by supplying milk free from tubercle bacilli, we must also as far as possible prevent the inhalation of tubercle bacilli by the employees working in the cow-stalls, etc. In veterinary laboratories due attention must be paid to bovine infection and bovine strains, and bovine material must be handled with the same caution as human tubercle bacilli. There is also reliable evidence that bovine tuberculosis can be transmitted from man to man and from man to cattle.

The changes that could be shown in some cases in the lungs and the hilar region in connection with the primary infection, correspond closely in appearance and localization with those observed after infection with human tubercle bacilli. Thus as a rule the glands in one or both hilar regions were considerably enlarged. Enlarged glands were also frequently found in the mediastinum. At the same time as the hilar changes, there occurred also in some cases lung changes, thus showing the presence of a typical primary lesion. Erythema nodosum frequently accompanied the appearance of the changes.

Of the greatest importance, however, is to learn to know the appearance and prognosis of bovine pulmonary tuberculosis. Not less than 28 such cases were observed and followed. Of these 28 cases, 22 had cavernous changes, 13 of the cases died, 4 are in a very poor state of health; the others give good promise for the future. Remarkably often the changes had from the very beginning an exudative, pneumonic character with the rapid appearance and growth—in spite of pneumothorax treatment—of cavities. This is not only characteristic of bovine tuberculosis, as the same form can be observed in pulmonary tuberculosis due to the human type. It should perhaps be pointed out that this form of disease appears to occur much more frequently than one is accustomed to in the Province of Skane, as far as human tuberculosis is concerned. Thus the bovine and human forms of pulmonary tuberculosis cannot be distinguished from each other, either in appearance or by clinical course. The only way to distinguish them is by typing the bacilli.

Case Finding in Tuberculosis

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BY briefly reviewing three cases of pulmonary tuberculosis discovered in a single family group, I wish to emphasize the importance of a detailed family history and a systematic examination of prolonged contacts in active and suspected cases of tuberculosis.

Several months ago I took over the practice of another physician who had a patient confined to bed following a pleural effusion. I obtained the following history from her.

She had been feeling perfectly well until February 1, 1939, when she developed a slight cold. A few days later she was bothered by a sharp sticking pain in the left side of her chest which was more severe upon deep inspiration. She had no fever and continued working for several days. The pain persisted and within a few days she developed a moderate elevation of temperature. Her family physician strapped her chest with adhesive tape and advised her to remain in bed as long as she continued to run a fever. Within a week the pain had disappeared and her temperature had returned to normal. She then returned to work, but within ten days she had a recurrence of both pain and fever. A Mantoux test applied at this time resulted in a positive reaction. On March 10th an examination of her chest by means of X-ray films revealed the presence of fluid in the left pleural space. There was no evidence of any parenchymal involvement. Three days later 250 cc. of a clear, straw-colored fluid were aspirated from her chest. Unfortunately no bacteriological studies were made upon the fluid obtained from this or any of the subsequent thoracenteses performed during the course of the next two months. The last attempt at aspiration was on May 28th and no fluid was obtained. During the course of her illness she had daily tem-

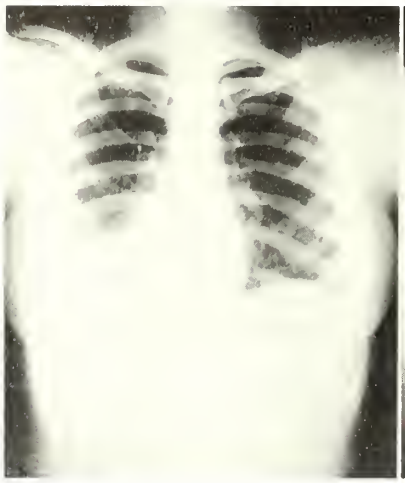

Fig. 1. First chest plate of H. B. pleural effusion.

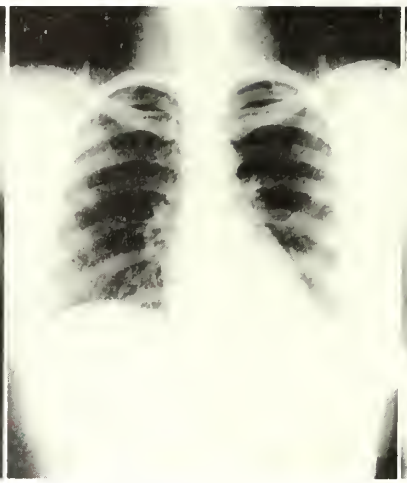

Fig. 2. Chest plate of H. B. (27) six months later. No fluid but residual pleural thickening. Clinically active

Fig. 3. Chest plate of M. B. (83). Fibrosis and cavitation. Clinically inactive.

perature elevations ranging from 99.4 to 100 F. She had no cough, night sweats, weight loss or fatigue at any time.

On June 1st, four months after the onset, I assumed charge of her case. At this time physical examination revealed a well-developed, well-nourished white female, age 27. Upon auscultation a loud friction rub was audible in the lower left side of her chest, most marked between the anterior and midaxillary lines. A few coarse rales could be heard above this area. Breath sounds were absent or diminished over the lower third of the left lung. Her right lung was apparently negative. Reviewing her history and physical findings I concluded that this effusion must be tuberculous unless I could prove it otherwise. This was in accordance with a maxim drilled into me during my courses in tuberculosis at medical school. During the course of the examination I learned that another physician assured the patient and her family that there was no possibility of this being tuberculosis. Therefore, I withheld my opinion and proceeded to search for more conclusive evidence.

My first step was to obtain another X-ray film of her chest. This showed marked thickening of the pleura on the lower left side. There was no fluid level and apparently no parenchymal involvement. An attempt to obtain sputum for bacteriological examination was unsuccessful as she had no cough. Failing in my attempts to obtain definite clinical evidence of tuberculosis, I made a detailed investigation into her family history. I learned that her aged grandfather, who was living with the family, had a chronic cough. He had been ill for several years and during the past six months had failed rapidly. Two years ago a bladder stone had been removed through a suprapubic incision. The family accounted for his present condition as an aftermath of this operation. At my suggestion he was brought to the office for examination.

He gave a history of having had a chronic cough for a number of years and stated that during the past six months he had been expectorating considerable quantities of sputum. He also complained of having had a sore throat and of being hoarse for the past two months. He had never coughed up any blood. His chief complaint was a marked weight loss with rapidly progressing weakness.

From the records of his hospitalization, two years ago, I noted that his only respiratory complaints were occasional colds of short duration and transitory precordial pain. Moist rales were heard at the base of both lungs and a Mantoux test was applied at this time. The results of the test were not recorded and no X-ray of the chest was taken.

When he first consulted me, a physical examination revealed a fairly well-developed, but emaciated, white male, age 83, with a loose productive cough and marked hoarseness. His temperature was 99.6 F. His pulse was slightly irregular and the rate was 100. His blood pressure was 98/62. There was inflammation and edema of the posterior pharyngeal wall. Indirect laryngoscopic examination showed a thickening of the vocal cords and ulceration of the mucous membrane of the larynx. Upon auscultation of the chest, coarse bubbling rales were heard throughout both lungs. The remainder of the examination was essentially negative. Laboratary results were as follows. The urine showed two plus albumen and, microscopically, many pus cells and 10 to 15 red cells per high power field. Sputum examination disclosed the presence of tubercle bacilli.

My conclusions were that the patient had a far advanced case of pulmonary tuberculosis, tuberculous pharyngitis and laryngitis, and possibly, a tuberculous nephritis.

At the request of his family I isolated him at home as his condition was terminal. He expired within the month. No X-ray films of his chest were taken as his death came before arrangements were completed with the county authorities for his transportation to a place where adequate pictures could have been obtained.

The discovery of this active case of pulmonary tuberculosis in a member of the immediate family confirmed my suspicion that the young lady, whose case I first reviewed, had a tuberculous pleurisy.

My next step was the examination of the fifteen members of the deceased man's family. Nine of these had been living in the same household with him for a year or more. The remaining six were frequent visitors who stayed a day or more at a time within the home. With the exception of the two youngest great-grandchildren, included in the latter group, they all had a positive

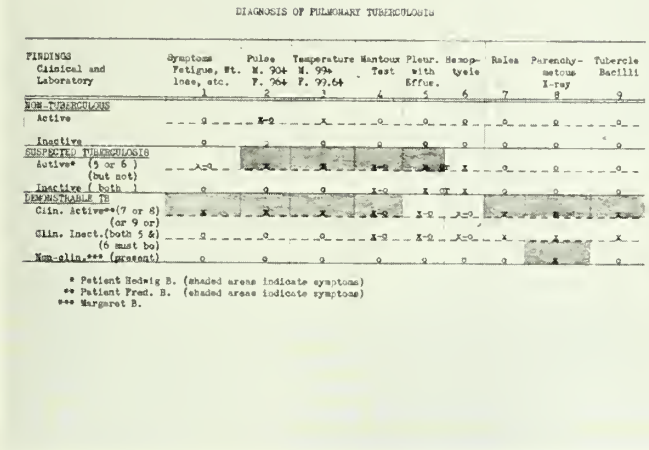

Fig. 4. Chart used to designate type of tuberculosis. Shaded areas represent symptoms of the three cases.

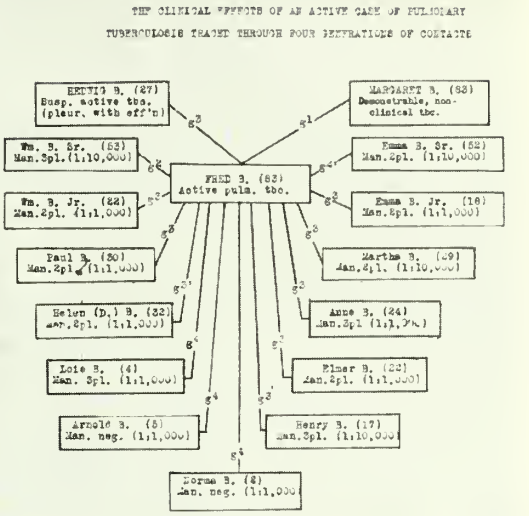

Fig. 5. Clinical effects of exposure on contacts.

reaction to the Mantoux test. Chest plates were taken of all the positive reactors. Excluding the films of the patient with the pleural effusion, they were all negative with one exception. The exception was the chest X-ray of the deceased man's wife which showed extensive fibrosis and bilateral cavitation near the apices. Her history was as follows:

Ten years ago she was very ill from a chest condition. She was confined to her bed for many weeks and it was more than a year until she had an apparently complete recovery. A diagnosis of pneumonia was made. At the present time this patient has no symptoms of an active case of tuberculosis. It is interesting to note that her brother, who died many years ago, suffered from a chronic chest condition. He was said to have had a chronic productive cough. His death was attributed to pneumonia.

You will note that I have uncovered a case of active pulmonary tuberculosis, an inactive demonstrable case of tuberculosis and a suspected case of tuberculosis within one family group.

I feel, with reasonable certainty, that we can trace the initial infection back to the grandmother's brother, who most likely died of pulmonary tuberculosis. My assumption is that the grandmother received her infection from her brother and that her husband received his infection from her. Through the grandfather the majority of his descendants through three generations have been heavily exposed, one granddaughter already showing suspicious signs of an active case of tuberculosis. Time alone will tell which of these will be victims of the "white plague."

We know that the unsuspected cases of tuberculosis are the most dangerous to society and we already have available methods of disclosing these hidden sources of infection. It is easy for the busy practitioner to forget the importance of family history and underestimate the value of small details. I hope that my experiences which led to the discovery of these cases will serve to emphasize the value of a diligent search for the source of infection in known active or suspected cases of pulmonary tuberculosis.

Tuberculosis in Lincoln County, Minnesota*

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WHATEVER has been done in Lincoln county is only a small part of what has been accomplished in southwestern Minnesota under the able leadership and guidance of Dr. S. A. Slater, and to him we are deeply grateful for having permitted us to be of some assistance in this monumental work. He is a perfect type of a man who is rapidly eliminating the conditions that provide him a position. From a waiting list of some thirty patients ten years ago, the sanatorium of which he is superintendent has at present only about half of the beds filled.

Since 1919 Dr. Slater has held semi-annual one-day clinics at Tyler which have probably been the greatest factor in bringing tuberculosis under control in Lincoln county. During each of these clinics from 30 to 60 patients have been examined and tested with tuberculin. The fine response these clinics have received is due no doubt, to the procedure of announcing in our county newspapers for several weeks previous, the time at which the clinics were to be held. In many instances cards were sent out to patients requesting them to appear for examination. At first, active cases were frequently found. Fortunately, we were usually able to persuade these patients to enter the sanatorium. During recent years, however, it has become a very rare occurrence to discover a single active case.

To cite one instance of what these clinics have accomplished: A year ago a waitress, from a family where five members had died from tuberculosis, came for examination. It was discovered that she was afflicted with minimal tuberculosis and was immediately sent to the sanatorium—she had a negative sputum. After about four months treatment she was returned home as an arrested case. She has since been able to resume her former occupation and has remained well.

Lincoln county is small, having a population of only 11,303. We have no cities and the largest village is Tyler with a population of about 1,000 inhabitants. We have a mixed population of Scandinavian, German and Polish, who are, as a whole, intelligent and coöperative. There are only eight physicians in the county. These, with but one exception, are all graduates of the University of Minnesota. We are deeply grateful to the University of Minnesota for the fine medical practitioners that have come from that institution to our little county, far away from the pleasures and the advantages of big cities. These physicians are all, with one exception, practicing modern 1940 medicine and have well equipped offices. There are two hospitals in the county in which two doctors are doing practically all the major surgery. If weather permits, our medical group holds meetings every second Tuesday evening throughout the winter months, at which medical and surgical movies are shown and cases are reported. During these meetings we talk over our success but devote special attention to our mistakes and failures.

In 1935 we decided to have all of the children of the county tuberculin-tested. The field nurse from the sanatorium was contacted and through her, Dr. Slater was asked if he would undertake the task. His reply was, "You and Dr. V. are both crazy!" Nevertheless, we were sure that Dr. Slater would not fail us because we knew that he was a tireless worker. After considerable planning we decided to invoke the help of our county superintendent of schools. The plan was explained to her but she seemed rather reluctant at first, explaining that it would be most irregular for her to participate in such a project. With her, we arranged for a meeting at the county seat to which the editors of our county newspapers were invited. It was explained to all attending this meeting the desirability of tuberculin-testing all children and teachers of the county. To this end, the superintendent of schools was requested to issue a call for all the school board members of the county to attend an evening meeting at the public school auditorium in the county seat. The board members were notified by post card and through the newspapers. Much to our and Dr. Slater's surprise, (we had expected 20 or 25 men and women to be present) there was almost 100 per cent attendance.

After Dr. Slater addressed the meeting, all who had attended, with but very few exceptions, were enthusiastic and coöperatively voted to have the tests given at the different villages throughout the county. It was also voted to grant the children in the different districts a half holiday on the day when the test was given and another half holiday two days later. I recall one rather amusing incident at this meeting. After Dr. Slater had explained that all those in whom positive tests resulted would be taken to Worthington for X-ray, one man spoke up and said, "Well, Doctor, how long will this take?" Dr. Slater answered promptly, "1/20th of a second."

Two thousand and twenty children and all the teachers in the county were given the test. Out of this group we found only 5.2 per cent tuberculin reactors for the entire county. Tyler's percentage was slightly over 3 per cent. Contrast this with two neighboring villages to the east of us in another county in which were found 22 per cent and 19 per cent reactors respectively, and 8 per cent for the entire district when they were examined during the same year. The X-ray examination of the positive cases disclosed no cases of pulmonary tuberculosis. Among the teachers, one active case was found. This teacher resigned promptly and was admitted to the sanatorium where she recovered. She was also afflicted with tuberculosis of the bones of the left foot and right hand. Later, I amputated her left leg. She was a pa-

*Read before the Lymanhurst Health Center medical staff, Minneapolis, April 25, 1939.

tient at the sanatorium for a short period, but is now an arrested case and is doing office work.

The affirmation of the effectiveness of our fight against tuberculosis in Lincoln county is found in the mortality statistics relating to the disease. It is, therefore, with a great deal of pride that I present the following:

1930	6 deaths
1931	4 deaths
1932	1 death
1933	1 death
1934	2 deaths
1935	3 deaths
1936	1 death
1937	none
1938	1 death

Having indicated the present local, state and national trend in tuberculosis, one would like to indicate what the future trend should or will be. Because there has been a steadily decreasing mortality from tuberculosis, some have been lulled into a false sense of security and have been led to believe that the problem of tuberculosis is well under control. Our efforts should not be lessened but increased. The physician will keep on educating the public to the point where individual coöperation in the search for contacts will be a routine if this is not made possible by state or municipal effort. The same state of mind towards "respiratory cleanliness" as exists toward food and intestinal cleanliness should be fostered.

There are, however, some matters for concern. The first is that we have not trained all medical students sufficiently to confidently diagnose incipient tuberculosis and to be capable of intelligently handling all the ramifications of the long treatment, including search for a source of infection and examination of contacts. Secondly, it does not appear that we have paid sufficient attention to the rehabilitation of the clinically cured, discharged sanatorium patient. It is interesting to note in this connection that the Anti-tuberculosis Association in Florence, Italy, has recommended the establishment of post-sanatorial colonies adjacent to the sanatorium where discharged patients may be prepared for their new working life under medical supervision. Whether our program should take the form of this Papworth model remains to be seen. It may be that the employer will find it possible to work out a scheme of taking back previous workers on a gradually increasing time schedule under medical care. And thirdly, can we not do more about those occupations in which the mortality from tuberculosis is disproportionately high?

True it is that we have not yet developed a specific treatment for tuberculosis, but efforts along this line are being made, and will undoubtedly be continued. The task before us is herculean and to accomplish the desired end we should approach the future with the spirit of the man to whom the difficult thing is one which may take a little time to do; and the impossible, one which takes a little longer.

More and more as we struggle for higher aims, I see the truth of what John Stuart Mill so beautifully said: "All the sources of human suffering are in a great degree, many of them almost entirely conquerable by human care and effort, and though their removal is grievously slow, though a long succession of generations will perish in the breach before the conquest is completed, yet every mind sufficiently intelligent and generous to bear a part, however small and inconspicuous—will draw a noble enjoyment from the contest itself which he would not for any bribe in the form of selfish indulgence consent to be without."

DISCUSSION

S. A. Slater, M.D.
Worthington, Minnesota

Dr. Vadheim has given us an excellent example of what can be accomplished by coöperation in the fight against tuberculosis. Lincoln county has been fortunate in having a group of physicians who are alive to the fact that the practical way to conquer tuberculosis is by all agencies working together rather than each trying to do the job independently. This county is one of nine comprising the district which maintains the Southwestern Minnesota Sanatorium at Worthington. The cooperation of the physicians has been 100 per cent. They realized the value of the sanatorium from the beginning as being the proper place for the treatment of tuberculosis. Their efforts have been to find the case early and have him admitted to the sanatorium as soon as possible both to give the patient the best chance to recover and at the same time prevent the spread of disease to those with whom he might associate. This mutual coöperation of the physicians and the sanatorium has achieved remarkable results. This is evident by the rapid fall in the death rate from tuberculosis and also by the low incidence of infection as revealed by the tuberculin test. The school population of this county has been as completely tested as any in the country and only 5.2 per cent were found to be infected. No children were found among the positives, as revealed by X-ray, to have clinically active tuberculosis.

The physicians of the county are planning to test all children either before entering school or during the first year, not because they expect to find active tuberculosis among the pupils but it will be a most valuable aid in finding the source of infection. This is the most ideal and progressive program I have ever known, and the physicians are certainly to be congratulated on their plans. The physicians of the county cooperating with the sanatorium has shown what can be done. Certainly work like this demonstrates emphatically that there is no need for state medicine, for everyone realizes the state alone could not do as good a job as has been done.

As good as the results have been, there remains a weak link in the chain. I believe Dr. Vadheim will agree with me that some provision should be made to take care of the incorrigible patient. He usually refuses to enter a sanatorium and when he does fails to coöperate in the treatment or remain long enough to have the disease arrested. The state should provide some place where these patients can be segregated and treated until their condition has improved so that they will not be a source of danger to those with whom they associate.

Until some provision is made for the control and care of this type of patient, nests of infection will remain from which new cases of tuberculosis will arise. With control of the incorrigible and continuation of the work that has been done in Lincoln county I feel that we can look forward to an early date when tuberculosis will be completely wiped out. This not only applies to Lincoln county but to other counties and communities using the same method in waging a campaign against tuberculosis.

The Fluoroscope and the Pneumothorax Apparatus as Tools for the Protection of the Public Health

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San Juan, Puerto Rico

IN Puerto Rico the fluoroscope and the pneumothorax apparatus are used as tools for the protection of the public health. The fluoroscope is our chief instrument for the early diagnosis of a communicable disease, tuberculosis, while the pneumothorax apparatus constitutes our great recourse for controlling the spread of tubercle bacilli. We are using the fluoroscope as a substitute for the tuberculin test in the screening of suspicious cases of tuberculosis in adults and in children above the age of twelve. We feel justified in this substitution because of the high proportion of tuberculin reactors above the age of twelve. Over 80 per cent of children in the teens give positive reactions to the Mantoux test and we have concluded that it saves time, effort and money to fluoroscope every suspicious adolescent and adult on his first visit to the clinic rather than wait for the result of a tuberculin test which in over 80 per cent of the cases will be positive. When the fluoroscopic examination gives suspicious or positive results, an X-ray picture of the chest is taken. When there are suspicious symptoms such as hemoptysis, a cough of more than two months' duration, or persistent fever, an X-ray picture of the chest is taken irrespective of the results of the fluoroscopic examination.

We take X-ray pictures with our fluoroscopes. They are 30 milliampere machines, and, where a radiographic equipment is not available, they are equipped with a timer and a casette-stand which make possible the taking of X-ray plates with very simple adjustments. Altogether we have nineteen fluoroscopic equipments distributed in tuberculosis clinics and hospitals throughout the island. Thirteen of these are accompanied with radiographic equipment and the rest have been adapted for the taking of X-ray plates, as explained above. Except in three instances the fluoroscope is part of the equipment of a public health unit. For the taking of X-ray plates in public health units which are not equipped with fluoroscopes, we have three portable X-ray units, each of which covers a certain district. The fluoroscopic work is done by specialists, but the medical officers of the public health units are being trained in its use. The number of fluoroscopic examinations made in the tuberculosis clinics of the Health Department during the fiscal year 1938-39 was 71,220. Thirty-two thousand five hundred sixty-eight X-ray plates of the chest were taken and 5,648 new cases of tuberculosis were found.

The pneumothorax apparatus, our chief implement for the treatment of pulmonary tuberculosis, is used extensively in seventeen clinics for ambulatory cases of the disease. We use it as a public health measure, with the purpose of controlling the spread of tubercle bacilli by eliminating the germs from the sputum of patients. At the present time two thousand tuberculous patients are receiving the benefits of pneumothorax treatment in our clinics, while living at their homes. Ours is probably one of the most extensive services for ambulatory pneumothorax treatment in America.

Fig. 1. Application of pneumothorax treatment to ambulatory patients in one of the antituberculosis centers of the Health Department of Puerto Rico.

Our pneumothorax service for ambulant cases of tuberculosis was begun in 1934. In 1938 we made a survey of 3,824 cases treated in the first three years and found that in one-third of these the disease had been controlled and the sputum had become negative. These results are considered satisfactory and we are certain that with the improvement of present facilities for home visiting and for prompt pneumolysis the benefits of the treatment can be greatly increased.

In 1933, the year before this program of ambulatory pneumothorax treatment was started, the tuberculosis mortality rate in Puerto Rico was 337 deaths per 100,000 inhabitants. In 1939 the corresponding rate was 258—a drop of 23 per cent in tuberculosis mortality in six years. We believe that the anti-tuberculosis campaign of the Health Department has had some influence in bringing about this saving of lives.

An effective diagnostic service and facilities for prompt pneumothorax treatment are indispensable in any campaign against tuberculosis. Effective diagnostic service requires adequate equipment, which should be brought as near as possible to the home of the patient.

Anything that retards the diagnosis or treatment of tuberculosis works against the public health. The flu-

†From the Health Department of Puerto Rico.

Fig. 2. Partial view of portable exhibit used by the Bureau of Tuberculosis of the Health Department of Puerto Rico in its educational campaign.

oroscope, because it is relatively inexpensive to buy and to use; because it gives a high percentage of accurate diagnosis on the first visit of the patient; because it can be used for radiography; because it is essential for conducting the application of pneumothorax treatment and because it can be handled with relative efficiency by any physician after a short period of training, is one of the most important pieces of equipment now available for the campaign against tuberculosis and should be used far more extensively than it is being used at present in the United States.

The pneumothorax apparatus is a tool for the protection of the public health and it should be considered as such by every health department. It facilitates the effective treatment of open pulmonary tuberculosis and brings about the conversion of positive sputum into negative in a considerable proportion of cases. It protects the family and the community by avoiding contagion through the elimination of foci of infection. It can be applied in clinics to ambulant cases, thus saving the expense of prolonged hospitalization. Our experience and that of the Chicago Clinics shows that pneumothorax treatment can be initiated in clinics without hospitalizing the patient. Our proportion of deaths from pneumothorax accidents during the first three years of our clinic service was no greater than among hospitalized patients in spite of the fact that practically all our pneumothoraces were initiated in the clinic, the only precaution being to have the patient lie down for a while on a cot, after the first insufflation.

The application of pneumothorax treatment to ambulatory patients as a public health measure enlists the coöperation of the medical profession and the public in the campaign against tuberculosis. Every case treated successfully with pneumothorax constitutes tangible evidence of what the public health authorities are doing to fight tuberculosis. The gratitude of the patient and the family facilitates the examination of contacts and private physicians get "pneumothorax-conscious" and promptly refer all suspicious cases to the tuberculosis clinics.

As a further means of facilitating the diagnosis of tuberculosis, our radiologist, Dr. G. Ruiz Cestero, is now making experiments in collective fluorography. If these experiments are successful—and so far the results have been very encouraging—we hope to use the method in an extensive survey that will eventually cover large areas where tuberculosis is especially predominant.

The Control of Tuberculosis Among Students at the University of Pennsylvania

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TUBERCULOSIS mortality has declined approximately 75 per cent in the United States since 1900. An accurate appraisal of the relative effectiveness of the various factors responsible for this very marked improvement would be extremely difficult. The measures which have contributed most directly to the steady reduction in both morbidity and mortality include: early diagnosis, through more extensive use of routine tuberculin tests and X-ray; improved facilities for the segregation of infectious patients; more careful investigation and supervision of contacts; the almost complete eradication of tuberculosis in cattle; improved techniques in treatment, whereby a much higher percentage of open cases are rendered non-infectious than was formerly possible. To these may be added certain biologic factors which have undoubtedly played a more or less favorable role.

There are those in the field of public health who are now thinking in terms of complete eradication of tuberculosis in this country. The tuberculosis death rate for the United States registration area in 1900 was 201 per 100,000 population. The rate for 1938 has reached an all-time low of 49. If the trend in tuberculosis mortality from 1900 to 1938 is maintained, a rate of 20 annual deaths per 100,000 population may be reached within 30 years. However, this may be achieved within a shorter period if those control measures which are now being used so effectively in certain groups and communities are put into more general practice throughout the entire country.

At the present time there can be no disagreement regarding the feasibility of adequate tuberculosis control for any community, large or small. The control of this disease does not differ, fundamentally, from that of other infectious diseases which are transmitted directly from person to person by way of the respiratory tract. Nor must we lose sight of the fact that tuberculosis still ranks high as a major public health menace. In the state of Pennsylvania, tuberculosis was responsible for 4,381 deaths in 1938. This toll in human lives exceeds by far the combined total deaths caused by the eight common communicable diseases, exclusive of pneumonia, namely: influenza, syphilis, typhoid and paratyphoid fevers, scarlet fever, measles, diphtheria, whooping cough and poliomyelitis. It is indeed a strange paradox that enforcement of public health regulations is so uniformly lax in regard to tuberculosis, yet carried out with such meticulous detail in practically all other infectious disease conditions. There can be no justification for such official public health indifference toward a disease which inflicts such a heavy social and economic burden. Recent comment by the United States Public Health Service[1] in this connection is quite timely:

"It would seem appropriate to emphasize the harmfulness of the unfortunate publicity given certain diseases such as poliomyelitis. The nature of the disease is such as to cause widespread fear, much of which is groundless, little of which is productive of well-considered action. The appearance of a single case of the disease in a community frequently gives rise to disproportionate public concern throughout an entire state; thousands of inquiries reach the Public Health Service regarding the probability of the epidemic spread of the disease. At the same time the public remains comparatively indifferent to the more definite menace of less well dramatized conditions, such as tuberculosis among young people. This in spite of the fact that there are as many deaths from tuberculosis each year as there were cases of poliomyelitis in the past ten years. It is well to face such facts and to substitute calm consideration of actual values for emotional responses to threats which, though real, have been built up out of all proportion to their factual importance."

Our success in controlling tuberculosis in the future will depend largely upon our ability to meet the challenge presented by the unknown case. Recent X-ray surveys of large numbers of adult persons, comprising industrial groups, persons on relief, college students and others, have demonstrated how this problem can best be met. Investigations of this type carried out in large eastern cities, including Washington and New York, indicate that one to two per cent of the adult population have significant tuberculous lesions. In the state of Pennsylvania, with a total population exceeding ten million, and with 7,185,000 persons over 14 years of age, the number of unknown cases of tuberculosis may be conservatively estimated at 50,000 or above. Since the majority of these persons are actually or potentially spreaders of tubercle bacilli, it is quite obvious that they present a major problem in the field of tuberculosis prevention and control.

In recent years many universities and colleges have developed excellent programs for the control of tuberculosis among their students. The report of the Tuberculosis Committee of the American Student Health Association[2] for the school year 1938-39, brings out very clearly the advantages of close supervision of a young adult group by means of routine tuberculin testing and chest X-rays. There were 117 institutions with a total enrollment of 129,851 students which reported to the committee as having no program of tuberculin testing and no routine chest X-rays. These institutions found but 19 cases of pulmonary tuberculosis during the year, an incidence of 1.4 cases of the disease per 10,000 students. In striking contrast to this are the results reported by 165 colleges which have definite control programs that include routine chest X-rays for at least a part of the student body. The total enrollment in this group was 348,713 students. At these institutions 607 cases of tuberculosis were discovered during the year, an incidence of 17.4 cases per 10,000. It is significant also that 241 of these students had clinically active disease.

For the past nine years the University of Pennsylvania has incorporated in its student health program certain measures designed for the early detection and control of tuberculosis. The following groups of students are now included in our annual chest X-ray survey:

1. Entering class—all new students who react to tuberculin.
2. Athletes—all students who are members of varsity teams engaging in intercollegiate athletics.
3. Teachers in training—members of the entering and senior classes in the School of Education.
4. Medical students—annual chest X-ray required of all students.
5. Upper classmen—seniors and juniors of all other schools are given the opportunity of obtaining a chest X-ray without cost.

During the present school year this plan has enabled us to X-ray the chests of approximately 40 per cent of our entire enrollment of 5,800 students. New students, numbering approximately 1,300 each year, are required to report to the Health Service for a physical examination during registration week. As a part of this examination a tuberculin test is applied. The incidence of positive reactions has remained almost constant during this nine year period, averaging about 50 per cent. This is, of course, much higher than is reported by various universities in certain other sections of the country, particularly the middle west where not infrequently 25 per cent or less of first year students react to the test. For our test material we use Saranac Laboratories old tuberculin and employ the two-dose Mantoux method. The initial dose is 0.01 mg. O.T. injected intradermally and if no reaction occurs the second dose of 1.0 mg. is applied. As the students report back for a reading of the test, each positive reactor is given an appointment for a chest X-ray.

Although the incidence of pulmonary tuberculosis is comparatively low in our first year students, we feel that the results obtained justify a continuance of this procedure. It has been the means of detecting a number of entering students who had active disease with positive sputum. An active college life would have undoubtedly resulted disastrously for these students had treatment not been instituted at once. Moreover, their presence on the campus would have been a source of real danger to their associates. Myers[3] and Stiehm[4] have called attention to rather striking situations which have arisen in fraternity and sorority houses as a result of exposure to unrecognized cases of open tuberculosis.

Since we have upwards of 300 students engaged in various intercollegiate sports, we feel that this group should be given the advantage of most careful supervision. Frequent physical examinations, such as we require, will not suffice for the detection of the early tuberculous process. In our experience, approximately 80 per cent of those students who have been found to present X-ray evidence of early, unstable tuberculous lesions have been asymptomatic and have presented no abnormal physical signs over the involved area. Strenuous physical activity over a prolonged period will almost invariably contribute to the rapid spread of such a lesion. Nothing short of the annual X-ray survey which we employ could provide adequate protection for our athletes.

Seniors in the School of Education are included in this program for several reasons. The State Department of Education requires the applicant for a teachers' certificate to file a medical statement wherein the examining physician certifies that the candidate is free from tuberculosis in a communicable form. We are therefore not justified in issuing such a statement except on the basis of a most careful examination. And no such examination would be complete without an X-ray film of the chest. Many school districts in the state of Pennsylvania now require all new applicants for teaching positions to file, as a part of the health certificate, a report of a recent chest X-ray. Such a requirement is indeed a forward step in the control of tuberculosis in the public school system. However, the modern teacher training institution should do more than provide a program which will permit the graduate to meet such requirements as outlined above. New responsibilities must be faced in the selection and training of teacher material if the profession is to supply the type of leadership in the health program of the community which is now so frequently demanded.

It has been our observation that medical students present a special problem with reference to the development of tuberculosis. Soper and Amberson[5] have recently summarized the experience of various medical schools and hospitals which have conducted special studies concerned with the risks involved in the training of medical students and nurses. As is well known, morbidity and mortality from tuberculosis increases rapidly during the years following adolescence. The age factor will, therefore, account for a certain increased incidence of tuberculosis among medical students as compared with those students on the undergraduate level who average about four years younger. However, if the age factor alone were responsible for the increased prevalence of the disease, we should expect to see a rather gradual increase during each of the four years. But this is not the case. The great majority of medical students who have developed pulmonary lesions at the University of Pennsylvania have been members of the junior and senior classes. This characteristic distribution of cases has been quite uniform during a ten year period. It would seem, therefore, that the only valid explanation for this may be found in the increased opportunities for infection provided in the clinical years through contacts with tuberculous patients. Various measures have been adopted during the past several years to reduce such hazards, and results, as evidenced by a lowered morbidity rate, are now being obtained.

Since we follow our medical students very closely from year to year with repeated tuberculin tests for all negative reactors and an annual chest X-ray for each student regardless of the tuberculin reaction, we have an excellent opportunity to observe the early development of tuberculosis in the young adult. Approximately 60 to 65 per cent of medical students are positive to tuberculin

at the beginning of the first year. At graduation there are usually but two or three members of the class who fail to react to tuberculin. We have therefore been able to observe several hundred students over a four year period, all of whom changed from tuberculin-negative to tuberculin-positive at some time during this interval. The total morbidity among this group is represented by four cases of serofibrinous pleurisy, three cases of pulmonary tuberculosis of the primary infection type, and twelve cases of reinfection type pulmonary tuberculosis. No case of erythema nodosum has been encountered in our entire student body during a nine year period. In our experience, pleurisy with effusion and the parenchymal lesion of primary infection in the adult make their appearance in about five to seven months after the development of tuberculo-allergy. The majority of students who have developed lesions of the adult type, having been non-allergic at entrance, have done so only after an interval of two years or more from the date of their primary infection. However, in one student this interval was 19 months and in another 341 days. The morbidity rate among those students positive to tuberculin at the time of entrance is approximately three times that encountered among students who enter medical school tuberculin-negative. Primary infection in adults is attended by no greater risks than when acquired in childhood.

The case-finding program now in effect at the University of Pennsylvania is producing results which amply justify the time and money required. Its educational value is, we are convinced, far-reaching. In 1934 we offered for the first time, a chest X-ray to any student who might desire one. In that year approximately thirty students came in for appointments. During the present school year approximately one thousand upperclassmen reported voluntarily for this service. Having x-rayed a total of 2,300 students during the present school year, we have discovered 22 cases of pulmonary tuberculosis. Only one of these had previously been diagnosed. Interestingly enough, the diagnosis had been made the previous year as a result of a routine X-ray survey conducted by a neighboring university which the student was attending. Twenty students had incipient disease and two were classified as moderately advanced. Definite abnormal physical signs were detected in three of these cases but were far from obvious. We are in agreement with Soper and Amberson[5] when they say:

"It is our belief that for the promotion of early diagnosis of tuberculosis, maximum emphasis should be put upon the education of the oncoming generation of physicians as to the particular importance of the X-ray as the only means by which, as a rule, the small lesion will be detected."

For the past six years we have used the paper film for our routine X-ray survey work. The unique facilities provided by the Powers Rapid Survey method have enabled us to develop a program which would otherwise have been impossible. This procedure offers an economical and highly efficient method of case-finding. It has reduced to a minimum the time element and the costs involved in X-raying large groups, the two factors of greatest importance in the modern survey method of tuberculosis control. Two days are required for the completion of our X-ray work. These dates are arranged for with the Powers company before the opening of the University. Since it is obviously of prime importance to have the results of the X-rays available as early as possible, we usually schedule this work during the first two weeks of the school year. The developed films reach us about five days after the X-rays are taken and interpretation of the films usually requires from ten days to two weeks. Thus in about six weeks after the beginning of classes all X-ray reports have been recorded on the students' individual health records.

The plan which we have adopted for the actual X-ray procedure takes care of ten to twelve hundred students a day with a minimum of confusion. The X-ray equipment is set up on the main floor of the gymnasium, which provides a space 250 feet by 70 feet. Appointments are scheduled at the rate of ten students every five minutes or 120 X-rays per hour. This is made possible by the special design of the Powers X-ray unit whereby the machine is loaded with a roll of 100 films rather than the single film usually employed. X-rays are taken between the hours of 10:00 A. M. and 9:30 P. M. with a one-hour shut-down at noon and another at 6:00 P. M. Separate hours are set aside for women students during which time staff nurses are in attendance. The evening hours are provided for the convenience of students in the professional schools, athletes, and others who find it difficult to report during regular class hours. All student groups participating in the survey are contacted during the first week or ten days of school so that the scheduling of appointments is completed before the X-raying begins. Six clerical assistants are provided for the handling of records as the students report to the gymnasium for their X-rays. File cards of standard size, bearing the student's name, age, date and results of previous tuberculin tests and chest X-rays, are prepared in advance and filed alphabetically. This record is originally made up at the time of the student's entrance physical examination and is preserved throughout his stay on the campus. After obtaining this card from the clerk the student presents it to the typist who places the name on a piece of lead foil, the letters appearing as perforations produced by a special type of electrically operated typewriter. He then proceeds to the X-ray unit, the identifying foil is placed over the right upper corner of the film, and the exposure is made. The entire procedure consumes, on the average, about seven or eight minutes of the student's time.

Although we occasionally find a student who presents rather extensive disease, and a few with cavitation and positive sputum, the majority of lesions encountered in our students are extremely minimal in extent. In dealing with this particular group one is impressed by the fact that a relatively high percentage of these lesions present all the characteristic features of a healed, latent process. Yet a careful history frequently fails to reveal any previous period of symptoms which might be associated with an active tuberculous process. This observation, repeated year after year in a large series of cases, indicates that many young adults develop significant tuberculous lesions of the reinfection type which go on to quite

satisfactory healing without having produced recognizable symptoms. We do not, of course, attempt to pass judgment on the stability of such a lesion on the basis of a single roentgenogram. We insist upon close supervision during the student's entire college career, with frequent clinical and X-ray check-ups. Such a student's physical activities are markedly restricted, particularly during the early periods of observation. It is our belief that young adults who present such findings should be rather closely supervised for a period of years, since it is not possible to predict the future behavior of any given lesion.

Having X-rayed approximately 12,000 apparently healthy students during the past nine years, we are convinced of the value of this particular type of supervision for young adults. The real danger zone for the development of tuberculosis is between the ages of 15 and 30 years. Tuberculosis rarely gives rise to symptoms during the early months of its development and physical examination fails to reveal its presence in the vast majority of cases. The tuberculin test followed by chest X-rays for the positive reactors, are the only measures which may be relied upon for early diagnosis and eventual control of this preventable disease.

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Tuberculin Testing Results for 3421 College Students, State of Washington, 1935-38

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SPURRED by a desire to give the college students of the state of Washington every opportunity to prevent tuberculosis, the Washington Tuberculosis Association has been conducting during the past four years tuberculin testing studies in six colleges in which the enrollments (table I) ranged from less than 500 to over 4,000 students.

The total enrollments of these colleges were 8,676 but of this number only 4,417 students were accessible for the study. The tuberculin test was administered to 3,421 students of which 1,443 were young men and 1,978 young women. One college had tests given during the summer session as well as in the regular academic year; in the college having the largest enrollment the tests were offered to only a small selected group since the experience was new and certain members of the college faculty health committee being doubtful of the outcome, wished to determine the student reaction to the program. The results being favorable, last year all entering freshmen were given the test in this institution.

None of the colleges at the time of this study employed a full time physician, but a student health fee was collected in all of them. The campus facilities provided were chiefly dispensary and infirmary service directed by a nursing staff. Two colleges employed part time physicians, the others had arrangements with the community medical profession.

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TABLE I.
Number and Size of Institutions Where Testing Was Done

Enrollment	No. of Schools
Less than 500 students	1
500 to 999 students	4
1,000 to 1,999 students	0
2,000 to 2,999 students	0
3,000 to 3,999 students	1
	6

Total Student Enrollment		8,676
Students accessible for study	4,417	
Students tested	3,421	
Percent tested	77.5%	

The coöperation of the administrators of the colleges in which the study was conducted had much to do with the success of this program. The support of the Washington State Medical Association through the chairman of its tuberculosis committee was obtained and adopted as part of the program which had been developed to afford the students individual information about the cause, control and prevention of tuberculosis. The Washington Tuberculosis Association is much indebted to the State Medical Association for their assistance and coöperation.

The educational technique used in presenting the tuberculosis problem to the student was as follows: At a regular college assembly a physician, not only a recognized specialist in tuberculosis, but experienced in presenting the problem to student groups, lectured using

charts and slides to illustrate the primary points. A staff member of the association followed with a brief discussion on health as a fundamental for future success, and gave an explanation of the clinic procedure. Student participation was provided through a questionnaire covering personal and family histories. Individual conferences were arranged for all who desired them. While the purpose of the interview was primarily confined to discussion of tuberculosis, so many personal health problems of various kinds were raised that the great need for adequate health education and service to even this admittedly favored group was evident. Students absent from the assembly were sent letters and questionnaires so that the entire number available for the study was reached.

The results were very encouraging, as 77.5 per cent of those to whom the tests were offered responded. The tuberculin test was administered by Dr. S. L. Cox, diagnostician for the Washington Tuberculosis Association, in all but one of the colleges, where four local physicians served. In all cases, only one application of the test was made, using 0.1 cc. of tuberculin (O. T. Cutter's) in a 1 to 1,000 dilution.

Reactions to the test were given by 23.6 per cent of the entire group (table II). The rate for the men was slightly higher than shown by the women. It is interesting to note (table III) that with the exception of the year 1935 there was a gradual reduction each year in the percentage of the positive reactors. The exception in 1935 is probably explainable because the majority of the tests that year were given in a college with a large urban enrollment, while in the other years covered by the study, the students in colleges tested came from sparsely settled areas.

A study of the tuberculin reaction given by the students in the first, second, third and fourth year of college (table IV) shows that infection increased from 19.6 per cent in the first year to 27.9 per cent during the senior year, an average increase in the infection rate of 1.2 per cent a year, which shows the importance of close observation during these years. The postgraduate students reached an infection rate of 39.1 per cent.

A detailed report of the size of the community (table V) from which the students came, indicates that density of population may be a factor in the spread of infection, since the positive reactions among the students from very rural areas were only 20.0 per cent as compared to 30.0 per cent in those from the metropolitan centers.

A compilation of data showing positive reactions by age (table VI) tends to strengthen the fact that the density of population is a factor in this particular study. A decreased percentage is noted at the age of 19 years. This occurred because the largest number of the tested students were of this age and most of them were from the sparsely settled communities where even the tests given at an earlier date in the high schools from which many of them had come, showed an amount of below-average infection.

TABLE II.
Result of Tuberculin Test for 3,421 College Students, State of Washington—1934-1938

Students	Number Tested	Number Positive	Pct. Positive
Men	1,443	374	25.9%
Women	1,978	434	21.9
Totals	3,421	808	23.6

TABLE III.
Tuberculin Testing Results by Years for 3,421 College Students, State of Washington—1934-1938

Year	Total Tested	Pct. Positive	Pct. Men Positive	Pct. Women Positive
1934	903	23.0%	22.7%	23.3%
1935*	816	33.8	37.0	31.2
1936	669	19.4	19.4	19.5
1938	1,033	18.8	23.3	15.9
Totals	3,421	23.6	25.9	21.9

*Majority of tests given in 1935 were in a college located in a large urban center.
Note: No tests were given to college students in 1937.

In answer to the question "has there been tuberculosis in your family or have you had any other contact with tuberculosis?", 23.3 per cent of the students, slightly more than one out of five, said that they had had such contact. The tests in this contact group, 797 in number (table VII), showed that 37.5 per cent gave evidence of infection. The percentage of positive reactions in the contact group was practically *double* that of those who gave no history of exposure.

A tabulation of the source of contact (table VIII) showed a high incidence of infection when the family relationship was close or where the association had been intimate as with room-mates or school-mates. Of those who had a father dead from tuberculosis, 57.1 per cent showed infection, while 84.6 per cent of the number whose mother had died with the disease gave a positive reaction.

Twenty-one students stated that they were diagnosed as having had tuberculosis at an earlier age but that no tuberculin test had been given prior to this time.

Taking a cross section of the study group, one finds a student of the approximate age of 19, either a girl or a boy, resident of a very rural area, attending a college with an enrollment of less than 1,000 which does not employ a full time physician but furnishes limited dispensary or infirmary service. If an entrance examination is given to him, it appears to be hurried and superficial, often not even semi-private. Little attention may be given as to whether or not he has been vaccinated against smallpox, immunized for typhoid fever or diphtheria. No information is asked or given about tuberculosis. Medical service beyond dispensary or simple infirmary demands must be obtained locally or in an adjacent city. His health instruction is supposed to be covered by certain required participation in major sports or gymnasium work.

The student comes from a home where in one out of five instances he has had a possible contact with tuberculosis and he has a one to four chance of reacting to

TABLE IV.
Tuberculin Testing Results by Grade for 3,421 College Students, State of Washington—1934-1938

College Year	Students Tested			Students Positive			Percent Positive		
	Total	Female	Male	Total	Female	Male	Total	Female	Male
First	1,202	651	551	235	108	127	19.6%	16.6%	23.0%
Second	866	477	389	191	96	95	22.1	20.1	24.4
Third	744	472	272	187	105	82	25.1	22.2	30.1
Fourth	337	160	177	94	43	51	27.9	26.9	28.8
Postgraduate	233	190	43	91	73	18	39.1	38.4	41.9
Special	39	28	11	10	9	1	25.6	32.1	9.1
Totals	3,421	1,978	1,443	808	434	374	23.6	21.9	25.9

TABLE V.
Tuberculin Testing Results by Community Population* for 3,421 College Students
State of Washington—1934-1938

Community Population	Students Tested	Community Population Percentage	Students Positive	Pct. Positive
Rural to 5,000	1,534	44.8%	307	20.0%
5,000 to 50,000	1,039	30.4	247	23.8
50,000 and over	848	24.8	254	30.0
Totals	3,421	100.0	808	23.6

*Size of Community in which Student had lived most of his life.

TABLE VI.
Tuberculin Testing Results Showing Positive Reaction by Ages for 3,421 College Students,
State of Washington—1934-1938

Ages	Number Tested	Number Positive	Pct. Positive
17	164	30	18.3%
18	555	101	18.2
19	646	99	15.3
20	577	140	24.3
21	478	110	23.0
22	301	78	25.9
23	174	41	23.6
24	130	40	30.8
25	85	25	29.4
26 to 30	172	73	42.4
31 to 35	61	24	39.3
Over 35	78	47	60.3
Totals	3,421	808	23.6

the tuberculin skin test. He will be one of the group attending the tuberculosis assembly and eagerly consenting to the tuberculin test. If he happens to react there is a 50-50 chance that he considers his health to be good, but will nevertheless have an X-ray of his chest. Due to the educational program preliminary to the tests, he appreciates the importance of the reaction without becoming nervous or hysterical and learns that a scientific method for detecting tuberculous infection exists.

He will also know that an earnest endeavor is being made to inform him about tuberculosis so that through knowledge he may prevent it. But the job is large when one in every four college students included in this study needs personal tuberculosis supervision.

The summarized findings show that:

1. There were 23.6 per cent positive tuberculin reactors in colleges where tests were made.
2. The positive reactions were higher in students coming from urban areas.
3. The majority of students (75.0 per cent), lived in sparsely settled communities.

TABLE VII.
History of Tuberculosis Contact in Relation to Tuberculin Reaction as Shown by 3,421 College Students,
State of Washington—1934-1938

Tuberculosis History	Number of Students	Positive	Negative	Pct. Positive
History of Contact	797	299	498	37.5%
No History of Contact	2,624	509	2,115	19.4
Total Tested	3,421	808	2,613	23.6

TABLE VIII.
Source of Tuberculosis Contact in Relation to Tuberculin Reaction as Given by 3,421 College Students,
State of Washington—1934-1938

Source of Tuberculosis Contact	Total	Positive	Negative	Pct. Positive
Room-mate	4	4	0	100.0%
Sister-in-law	3	3	0	100.0
Husband dead	2	2	0	100.0
Boarder	1	1	0	100.0
School-mate	9	8	1	88.9
Mother dead	26	22	4	84.6
Sister dead	7	5	2	71.4
Brother dead	15	10	5	66.7
Father dead	21	12	9	57.1
Father living	17	9	8	52.9
Grandfather	16	8	8	50.0
Employer or work	8	4	4	50.0
Brother-in-law	2	1	1	50.0
Uncle	74	32	42	43.2
Friend	63	27	36	42.9
Sister living	29	12	17	41.4
Tuberculosis in family	5	2	3	40.0
Brother living	16	6	10	37.5
Cousin	52	19	33	36.5
Grandmother	23	8	15	34.8
Mother living	32	10	22	31.2
Aunt	86	26	60	30.2
Tuberculosis — self*	21	6	15	28.6
Source not given	245	58	187	23.7
Neighbor	19	4	15	21.1
Bovine	1	0	1	0.0
Total with contact	797	299	498	37.5
No contact	2,624	509	2,115	19.4
Total	3,421	808	2,613	23.6

*Student had had a previous diagnosis of tuberculosis, and indicated source of contact.

4. The major portion of the group included in the study was between the ages of 18 and 22.
5. There was an increasing incidence of tuberculous infection from the first to the fourth year in college, the average increase being 1.2 per cent per year.
6. A history of tuberculosis contact was given by 23.3 per cent of the study group.
7. Positive reactions were twice as prevalent in cases where a history of tuberculosis contact was given.
8. A high incidence of tuberculosis infection was shown where contacts were with close relationships or associations.

Fluorography

A New Method of Obtaining Radiographs of the Chest at a Low Cost

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FLUOROGRAPHY, also called roentgen photography, radio-photography, indirect radiography, or simply, photography of the fluorescent screen, has been utilized in a most successful manner by Dr. Manuel Abreu, consultant radiologist at the tuberculosis dispensaries in Rio de Janeiro, Brazil.

Properly speaking, fluorography combines the processes of a camera, a fluorescent screen and a roentgen tube. The result of this process is a minute photograph which, when flung on a screen or looked at through a magnifying glass, is augmented to twice or six times its diameter without loss of the smallest detail of diagnostic value. From the year 1906, different investigators, like Cole and Leven of the United States of America, and Commodon of France, have regarded fluorography worthy of careful and detailed study, as the means whereby roentgen moving pictures might be perfected. These moving pictures came into existence in the year 1935, when Georges Djian and Russell and Reynolds demonstrated examples by means of apparatus which apparently justified their work.

Dr. de Abreu has been deeply interested in fluorography since 1920. At first his experiments owed their non-success to two factors: The light which was radiated from the fluorescent screen was insufficient to impress plates sensitized with salts of silver in the minimum fraction of a second or, the salts of silver were not sufficiently sensitive for the weak light then thrown by the fluorescent screen.

These two disadvantages have been appreciably ameliorated during these last years as have also the power and quality of the modern X-ray machines, which can produce high milliamperages with high voltages for the production of roentgen radiation from a tube with a very small focal spot of only 4 mm.[2] As a consequence of these advancements, the technique for fluorography is practically perfect now. Also, modern photographic lenses have an extraordinary speed, usually *f*:1.2, *f*:1.5 and *f*:2. We have now been told that soon lenses of *f*:845 will be on the market.

During the last three years, emulsions used in photographic work have produced almost incredible results. Some are actually sensitive to infra red. We, however, were chiefly interested in the spectrum of yellow to green, which is characteristic of the latest fluoroscopic screens put under the name of Patterson B of the General Electric, or the Superastral of Siemens.

Abreu's fluorograph consists of a truncated pyramid guarded from sources of light, balanced by counterweights with a fluoroscopic screen measuring 16″x 16″ at its further end; on the nearer end is a camera, fixed on a system which permits it to slide and revolve in two senses, so as to allow movements for centering and focusing. A centering and focusing board may be used, with two wires crossed vertically to obtain good focalization instead of the fluoroscopic screen.

To focus the machine, the fluoroscopic screen must be removed; then the focalizing board is placed and the photographic machine may then be worked on the sliding and rotating system until the crossing of the wires is perfectly focalized in the center of the telemeter. The focalizing board is then replaced by the fluoroscopic screen. At present, the Camera de Abreu uses a Leica-lens *f*:1.5.

Dr. de Abreu's fluorographic technique is as follows: 1. Kodak Super XX film (Weston 160) or Agfa Isopan I.S.S. (Scheiner 31). 2. Tube-screen distance, 25″. 3. Screen-film distance, 36″. 4. Average adult patients, 50ma., 70kv.; exposure of 0.2 to 0.3 of a second. 5. Children, 100ma., 70kv.; exposure of 0.1 to 0.15 of a second. This technique is adapted to machines of half-way rectification.

Our experiments were carried out under different conditions. The fluorograph we constructed is 12″ wide, 16″ high and 33″ long. We changed the truncated pyramid shape to a rectangular form, because this permitted modification of the focusing system so that we could focus without withdrawing and replacing the fluoroscopic screen every time. A bulb, "Photoflood" No. 1 (500 watts), was placed below and to the left of the photographic machine. Between the fluoroscopic screen and the leaded glass a piece of ordinary clearly lined paper was placed, through lateral grooves. The bulb was lit, the camera focused exactly, and then the light was extinguished and the paper removed. The fluorograph was then ready to function. We used a Patterson B 12″x 16″ fluoroscopic screen, and the camera was a Leica *f*:2. Focal spot-screen distance, 25″ and screen-film distance, 33″.

The object of this was to use each film (2.4 x 3.5 cm.) to its fullest extent, so that fluoroscopic projection might not lose in its enlargement any detail, and to place the camera as closely as possible to the screen to reduce the time of exposure. As you may have noticed, we used implements for our trials which differed from those used by Dr. de Abreu. In the adaptation of our methods we changed the technical set-up of our fluorographs as follows: 1. A Kodak Super XX film. 2. Average adult patients, 100ma., 70kv., and an exposure of 0.3 to 0.4 of a second. 3. Children, 100ma., 70kv.; 0.15 to 0.2 of a second. The X-ray machine used was General Electric, and the tube, S.P.1-4.

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The chief advantage of this method is its economy. The usual radiograph of the chest is made on films which measure 11x14" and 14x17". In fluorography, films may be used measuring 2.4 x 3.5 cm. whose sensitive surface is less than 200 times smaller than the usual film and its cost 100 times less.

In our Department of Health, last year, before the introduction of the paper film, the cost of each chest film per capita was $1.00. In our fluorographic tests a small number have shown the per capita cost to be 3c. The present price of a roll of Super XX films—36 exposures—is 90c, and half a gallon of developer costs 35c and is more than sufficient to develop 20 rolls; or, in equal proportion 700 fluorographic pictures. This short test shows that fluorography is 40 times more economical than those methods now in use. But if the use of fluorography becomes general in our country, we could buy film rolls of 200 ft. in length which could be divided into pieces containing 36 exposures and wound on reels of Leica capacity size and used at a cost of 1c a picture.

Another advantage in using these 35mm. pictures, is that a dark room is not needed, although they must be developed in absolute darkness because they are panchromatic. Let me explain more fully: Certain mercantile firms put out special light-proof tanks in which the pictures may be developed, though the loading of the tanks with the film to be developed must be done in absolute darkness. We have constructed a dark box, 12" high, 16" wide by 24" in length with a trap door on the upper side through which the implements necessary for loading the tank may be placed—the tank, its cover, the reel, scissors and, of course, the film. Once the trap door is closed, one may put both hands through apertures made light-proof by means of closely fitting cuffs, like those used by itinerant photographers. Once the film is loaded into the developing tank, one can open the trap door, take the tank out into the daylight and proceed to develop the film. This process may take one hour to complete, but as it has to be attended to only every 15 or 25 minutes, the technician can continue other fluorographic activities while the picture develops.

One can file fluorographic rolls of 36 exposures easily, keeping them in aluminum receptacles which occupy a space of only about 2 cubic inches. This system may be favorably contrasted with the present complicated method of filing, and the space may be advantageously used.

Again, the cost of renewing intensifying screens, the cost of sending radiographic material to other places, will be considerably lessened, and the efficiency of the technician increased by the labor spared him.

One hundred and fifty to two hundred fluorographs may be produced daily, or 6,000 a month, or 70,000 a year, through the medium of each fluorographic machine. In our Department of Health we have four such equipments capable of producing 100 ma. at 75 kv. With these four installations used simultaneously, we may obtain in one year about 300,000 fluorographs. Soon we shall have four very large equipments of 250 ma. to 100 kv. in our large district hospitals soon to be opened. If these eight machines are used part of the day in the interests of fluorography, we may, in about two years, have some reliable statistics to show from our tuberculosis census.

Tuberculosis is our worst endemic disease, and can be combatted only by means of a "chest census" to verify its frequency and location. Up to the present we lack laws compelling examination equal to those which demand vaccination before entrance to school or into a foreign country. It would be sufficient protection to produce a certificate of fluorographic examination before entering a profession or an institution on the part of the applicant and the immediate members of his family. This method, however, does not for one moment pretend to supercede fluoroscopy or roentgenography, the values of which are recognized as indispensable, but it does present the advantages of low cost and accuracy of detail, which are very necessary when dealing with mass surveys of tuberculosis. The Department of Health at the present time is concluding an extraordinary work in its campaign against tuberculosis. It is enough to glance at the annual reports submitted by the Commissioner to the Governor to become impressed with the enthusiasm, the centralization and the brilliant results attendant upon the attacks of that terrible enemy of our Island—the White Plague. Our tuberculosis hospitals and centers are organized to work in conjunction with each other. Recently the system of Public Health Units with their interlinking units of Social Service Work and the Bureau of Tuberculosis have dealt another hard blow at the bacillus of Koch. But there is still much left to be done, owing to the high cost of roentgenograms. Last year, for example, it cost $17,000 to make 40,202 radiographs. Of these, about one-half were in use in cases under treatment and the other half were used for cases under observation—and all these were supplemented by 77,523 fluoroscopic pictures. With 20,000 new cases studied each year, it does not seem that chest examinations of the Puerto Rican people can yet be studied on a large scale. Also it must be remembered that to do fluoroscopic work on a large scale, a number of skilled specialists are necessary, for, and here we cite the words of Dr. de Abreu, "A radiologist cannot make more than 100 fluoroscopies weekly, in three sessions. It is a laborious work which cannot be undertaken indefinitely, even though precautions are taken against the X-rays and bacilli. Fluoroscopy is a personal method of personal interpretation, without definite written diagnosis, which at times may lead to serious mistakes which could not be avoided." Now, fluorography is very impersonal—that is to say, in any moment the evidence is at hand to be discussed. Also, it is absolutely without danger both for the technician and for the patient.

We are convinced that the answer to our quest in the morbidity of tuberculosis lies in fluorography. On behalf of this conviction we will again quote from Professor Hans Holfelder, radiologist in the Women's Clinic of the University of Frankfort, Germany; Dr. Vaccarezza, President of the Anti-Tuberculosis League of Argentine, and Dr. D. O. N. Lindberg of Decatur,

Illinois. Commenting on the works of de Abreu, Holfelder says: "The work done by Dr. de Abreu merits the earnest attention when we consider a campaign against mass tuberculosis, because he has discovered a practical method which, in my opinion, has given to the X-ray its proper place in combatting tuberculosis." Dr. Vaccarezza says: "Considering the development of the fluorograph as an ally of social welfare, it may be considered one of the greatest medical conquests of our times." And lastly, Dr. Lindberg, who until now has used fluorography only in a limited manner in the Macon County Tuberculosis Sanatorium, comments thus: "De Abreu of Rio Janeiro has made practically possible the original ideas of Cole, Leven, Reynolds, Commodon and others, to photograph the radioscopic image. The apparatus is simple, and of very low cost. Three fluorographic units operate daily in three cities in Brazil, and five more will soon do so. This method is also used in dispensaries of Montevideo, Buenos Aires, Havana, Berlin and Frankfort." This quotation from Lindberg was uttered in May 1939.

In his recent article in *Radiology* of September 1939, de Abreau says that there are 25 working fluorographic units in Brazil.

Conclusions

1. Fluorography is now universally accepted.
2. Its cost is very low; each picture may be produced at 1c.
3. No dark room is necessary.
4. The films may be filed in very small space.
5. It is the only means yet evolved by which a thoracic census may be made in Puerto Rico rapidly, economically and efficiently.

Acknowledgments

Let me express my grateful thanks to Doctors Juan Arruza and William P. Gelpi and to the technical personnel of the Insular Sanatorium of Puerto Rico. These trials were made in the Miramar Clinic with the aid of Dr. Arruza, in order to test the efficacy of fluorography. There we had no light-proof fluorograph, and had to take the first fluorographic pictures in the fluoroscopic room and at night. On that account we did not obtain very good results. Thereupon we constructed our light-proof box and continued the experiments at the Insular Sanatorium of Puerto Rico. But none of these tests would have been possible had it not been for the enthusiasm and generous help accorded us by Dr. Gelpi, who not only loaned us his Leica camera, but coöperated with us himself in every way possible.

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Protection of Unavoidably Exposed Persons Against Tuberculosis*

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IN accordance with present knowledge of prevention, lacking a complete prophylactic, absence of infection is the only absolute protection from tuberculous disease. As infection from tuberculosis is reduced in a community, disease and deaths are inevitably reduced. The idea underlying the campaign against tuberculosis is the early segregation and treatment of the diseased in order to protect the well through the eradication of infection. Experience has shown that a great measure of protection against tuberculosis can be provided for the accidentally exposed population in a community or state by sanitary habits, early discovery, and early segregation of the sick in institutions. Such protection is being more and more adequately provided by health departments and anti-tuberculosis organizations.

*Presented to the Canadian Tuberculosis Association, September 8, 1939.

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It would appear that the present protective plan, concentrating attention on active cases, suspects, contacts and ex-patients, with the idea of eradicating infection, will reduce the tuberculosis mortality in this accidentally exposed group to a minor cause of death. For the general public, then, in an environment where tuberculization will remain partial during life, protection from infection is the foundation of prevention.

I have been asked to discuss the protection of that group in the community who are known to have more than average exposure to tuberculosis infection—that group who are known to be to a large degree unavoidably exposed.

Indian Infants

The protection of infants in highly tuberculized Indian families, where the living standards are low and where sanitary habits must of necessity be slowly ac-

quired, over a period of generations, is very difficult. The average tuberculosis death rate among Indian infants in the age group up to one year in the period 1930-34 in Saskatchewan was 1830 per 100,000. In view of the impossibility of segregating more than a portion of the infectious sick in these families under present conditions, the need of a prophylactic for infants in such homes is very great.

In 1933 vaccination of alternate births on the Fort Qu'Appelle Health Unit was instituted through the coöperation of the National Research Council, The Department of Indian Affairs and The Saskatchewan Anti-Tuberculosis League under the direct supervision of Dr. A. B. Simes.[1]

Up to July 31, 1938, one hundred and thirty infants had been vaccinated and re-vaccinated when negative to tuberculin, and controls to these infants have been tested with tuberculin and observed. There have been no cases and no deaths from tuberculosis among the vaccinated, while among an equal number of controls there have been five cases of tuberculosis, two of which died. The results to date in this small group have shown a very favorable experience for the vaccinated.

Certain Contact Families

Certain contact families in the general population require added protection. Studies on incidence of tuberculosis among contact families have shown the lesion incidence to be several times higher among the contacts positive to tuberculin than among positive reactors in non-tuberculous families. It would seem necessary, especially where the source of infection cannot be removed through lack of coöperation or otherwise, that negative reactors in these families should have their resistance increased by vaccination in addition to any non-specific measures employed such as improved living conditions and sanitation.

The experience reported by Boudouin[3] in Quebec, where the death rate among 573 vaccinated infant contacts exposed to positive sputum cases in the homes compared with the death rate among 943 non-vaccinated infants exposed to open cases in the home, showed a reduction of 75 per cent in favor of the vaccinated, suggests the value of such protection.

The experience of Walgren[4] in Gottenburg, Sweden, with one thousand infants in tuberculous homes vaccinated between 1927 and 1938, is very encouraging. In this group there had been no deaths up to May 27, 1938, and only two had fallen sick with tuberculosis.

Certain Sanatorium and Hospital Employees

Let us now consider those who are engaged in the care of the sick — doctors, nurses, ward maids, kitchen maids, cleaners and orderlies on the wards of hospitals and sanatoria. In order to make the problem definite let us review briefly the protection of sanatorium and hospital ward employees.

About a decade ago in many places, particularly in the United States of America and in Canada, staffs closely associated with bedside care and cleaning in sanatoria began to break down in increasing numbers, as did also nurses-in-training in general hospitals, and nurses and attendants in mental hospitals. The sanatoria and hospitals became worried over this condition, and checked up on pre-disposing causes of breakdown. Better living conditions, including many new nurses' homes and the services of dietitians, were provided. Better instruction in infectious technique was instituted. The value of sanitary technique in protection against infection has been demonstrated in both acute infectious hospitals and sanatoria. Considering the human difficulties during the period of apprenticeship, the protection conferred by sanitary habits is in a practical way limited. This is best illustrated by the cases of nurses-in-training, who may be considered amateurs in the practice of sanitary technique. Protection by this method is acquired after long and intensive practice; is maintained at the price of eternal vigilance, and is subject to human error; it is by no means absolute. Notwithstanding these efforts to improve non-specific protection the problem remained.

In Saskatchewan, where, excluding Indians, segregation and treatment has exceeded three patients for each death from tuberculosis for the past ten years, morbidity from this disease has steadily fallen among the general population since 1930, but in the sanatoria and hospitals employees morbidity has not fallen. New active cases of tuberculosis discovered 1930 to 1938 in Saskatchewan were as follows:

	Graduate Nurses	Student Nurses	Assistant Nurses	Total
1930	12	10	2	24
1931	10	14	2	26
1932	10	12	0	22
1933	12	9	2	23
1934	7	10	0	17
1935	10	7	0	17
1936	10	10	3	23
1937	5	10	5	20
1938	12	11	8	31
Total	88	93	22	203

On June 30, 1939, there were under treatment in Saskatchewan 17 graduate nurses, 13 nurses-in-training, and 12 other hospital attendants; constituting 5.3 per cent of the 780 patients under treatment.

Our study shows that during the period 1930-1935 the average incidence of admissions among nurses-in-training was 1.14 per cent per annum, and for the years 1936-1938 inclusive 1.6 per cent per annum. The average for the nine year period 1930-1938 was 1.44 per cent per annum. This incidence was more than ten times that found among young adult Normal School pupils examined each year in a similar age group (0.15 per cent), and more than ten times that in the general female population in the age group 20-24 years known to have fallen sick in 1938 (0.152 per cent).

In 1930 a further effort was made to protect the staff against serious disease, and a routine examination by X-ray on employment was established, followed by periodic X-ray examinations. Still a high morbidity persisted. In 1934 tuberculin testing on employment and

of negative reactors at intervals thereafter was established. In 1939 it became possible to make a preliminary analysis of the information gained by a study of tuberculin, X-ray and physical condition. Such a preliminary study has recently been made in an unpublished paper by Dr. R. G. Townsend of our medical staff. This study revealed three outstanding facts.

First, it was found that in the interval an increasing proportion of the staff have been employed year by year with negative tuberculin reactions, the proportion negative increasing from 31.7 per cent in 1934 to 60.4 per cent in 1938.

Secondly, it was found that unavoidably exposed staff with negative tuberculins soon became positive; 26.14 per cent within six months and 39.86 per cent within a year, and very few going beyond two years.

Thirdly, it was observed that a higher proportion of the breakdowns occurred among persons employed with a negative tuberculin reaction compared with the incidence among those employed with a positive reaction. Among 359 exposed persons having a positive tuberculin on employment during the five year period January 1934 to December 31, 1938, 1.1 per cent developed lesions demonstrable by X-ray, an incidence of 0.22 per year. This incidence, though slightly higher than that admitted for treatment from young adults in the age group 20-24 years in the general public (0.152 per cent) in the same province was very much lower than that found among exposed young adults on the same staff negative to tuberculin on employment. During the same period, among 306 employees found negative to tuberculin on employment 2.026 per cent per annum developed lesions demonstrable by X-ray. Not all of those who developed lesions required treatment. Small lesions sometimes cleared up while continuing work under observation. You may feel that these transitory lesions were of no practical importance. Nevertheless, after eliminating lesions which did not require treatment among these 306 persons employed negative to tuberculin, 1.04 per cent per annum required sanatorium treatment. This incidence was 4.7 times greater than the incidence requiring treatment among those employed with a positive reaction.

The increased resistance shown in this environment by employees positive to tuberculin drew attention to the studies of Heimbeck in Oslo[5] in which he reported a much increased resistance to the disease among nurses positive to tuberculin prior to entering the hospital compared with those who were negative to tuberculin. This author reports that among 625 Pirquet positive on entering training there were 27 instances of disease and no deaths, while among 280 Pirquet negative on beginning training 96 developed disease and ten died.

This condition was also noted in the studies of Badger and Spink[6] in which they reported that one case of tuberculosis developed among 162 nurses reacting positively to tuberculin on entering training, compared with seven cases which developed among 111 nurses reacting negatively to tuberculin on entering training.

A similar observation was recently made in 1939 by Scott[7] on nurses-in-training in the Winnipeg General Hospital. During the period 1934 to July 1938 among a group of 84 nurses positive to tuberculin on entering the hospital, no cases of tuberculosis developed during training, while among a group of 90 who became positive to tuberculin after entering the hospital, 13 cases of tuberculosis developed during training. One hundred others remained negative throughout training. The incidence of disease among the 190 negative reactors on enrollment was 1.13 per cent per year.

Scheel[8] in 1935 observed in a study of 361 medical students in Oslo that among 154 positive to tuberculin on registration 1.47 per cent developed the disease, while in the group of 207 negative to tuberculin on registration 4.31 per cent developed tuberculosis, the proportion among those negative when exposed being almost three times that among those positive.

Mariette observed a similar difference in his studies reported in 1935,[9] and Amberson and Soper have suggested this tendency in their excellent review of tuberculosis among medical students and nurses in January 1939.[10] As might be expected in a case which is relative and one of degree, there is considerable difference of opinion recorded by observers in regard to the comparative susceptibility of these groups and the relative incidence in large numbers has not yet been determined, but recent studies are generally favoring the definitely lower incidence shown among previously positive reactors in these excessively exposed groups.

It would appear from these observations that favorable living and working conditions in hospitals and sanatoria, combined with preventive technique as practised, gave reasonable protection to persons who had acquired the resistance afforded by previous infection without a parenchymatous lung lesion, but that these conditions did not provide adequate protection for negative-to-tuberculin-employees in the same environment.

Many training schools for nurses and sanatoria have been and are now giving preference to tuberculin positive applicants and a few go so far as to refuse those negative to tuberculin. It would seem that there is reasonable grounds for such selection. And it appears necessary where it is impossible to secure sufficient applicants positive to tuberculin that some additional specific protection should be provided for this tuberculin-negative unavoidably exposed group where they continue to be employed; not to replace but to supplement non-specific preventive measures such as infectious technique, better living and working conditions, etc.

The added protection associated with allergy is another barrier, a higher threshold of resistance. And when it can be secured by vaccination without the hazard of a potential focus of virulent infection it becomes increasingly attractive.

Heimbeck in his studies of prophylactic vaccination with B.C.G. observed that the incidence among vaccinated nurses who became positive from vaccination has been much lower than among non-vaccinated negative reactors. Among 341 made positive to tuberculin by vaccination there were 12 diseased and no deaths; while among 234 negative on employment not vaccinated there were 97 diseased and 12 deaths.[11]

Ward employees in hospitals and sanatoria now know that infection with tuberculosis is a hazard of their employment. They are advised of the danger points in their occupation on employment, and are instructed in the technique necessary for protection against infectious diseases; nevertheless the high proportion of breakdowns is a serious concern. Consequently in addition to previous safeguards we are making B.C.G. vaccine available to negative reacting employees who will be exposed to infection on the wards of sanatoria and hospitals in Saskatchewan on the signed request of the employees.

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The Need of a Rational Medical Technique

For the Safeguarding of Hospital Personnel and Medical Students

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In recent years numerous surveys have been made, in America and in other countries, to determine the incidence of disease among medical students as compared with that among students in the other university departments. Likewise, similar surveys have been made to determine the incidence of disease among nurses and other hospital personnel, unavoidably in contact with the sick in hospitals and sanatoria, as compared with that among persons of similar age groups otherwise employed.

It is judged that no useful purpose is to be served at this time by referring to these surveys in detail, except that, for those who are not already familiar with them, and who may now be interested, mention may be made of a few of the statements that have appeared as the different surveys have been reported. For example, one reads that[5] "the observations reported have shown that tuberculosis was more frequent and much more severe in the medical students than in the law students, or the dental students examined," or, again,[8] "students of medicine and nursing are now known to be subject to a special hazard," and[8] "the incidence of tuberculosis (in nurses) is also proportionately high as compared with other professional or working groups at the same age." Also,[3] "the number of young adults with apical lesions of tuberculosis increases gradually with increasing age, but the incidence of these lesions in medical students increases rapidly in successive years of the medical course, with astonishingly high incidences in students of the fourth year, and this indicates that they are peculiarly subject to grave tuberculous infection."

Soper and Amberson[1] have made a very complete summary of a number of surveys as to the incidence of tuberculosis in medical students and nurses and reached the conclusion that medical students are as a rule less rapidly and less certainly infected with tubercle bacilli than are student nurses, but they still acquire infection to an excessive degree.

Myers, Ch'iu and Streukens[2] considered that students in contact with tuberculous patients in hospitals and sanatoria have definitely greater chances of becoming infected with tubercle bacilli than students who do not have such contact in the line of duty. The chance of being infected is proportional to the amount of the contact.

Thus it would seem to suffice, for the immediate purpose, to say that with rather striking uniformity the surveys already reported have revealed (1) that among medical students the incidence of disease is higher than among students in other university departments; (2) that the amount of time lost through illness by medical students is much greater than is that by students in other university departments; (3) that among nurses, and other hospital personnel, whose duties require them to be unavoidably in contact with the sick in hospitals, the incidence of disease and the amount of time lost on account of illness are both greater than among similar age groups otherwise employed; (4) that while the incidence of disease among nurses and other attendants on the sick in sanatoria is not as great as that among nurses in general hospitals, or as that among medical students, it is yet too high to be viewed with any degree of complacency.

In view, then, of this very extensive evidence already collected, it is difficult to avoid the conclusion that the environment of medical students, whose duties require them to work in schools of anatomy, autopsy rooms, pathological and bacteriological laboratories, hospital wards, and outdoor departments, presents a very special hazard; and that in the case of nurses and other hos-

pital personnel, whose duties require them to be unavoidably in intimate contact with the sick, there is a hazard not met by those of similar age groups otherwise and elsewhere employed.

Clinicians and hospital administrators who have become cognizant of these facts are actively seeking a remedy, because they recognize that there should be some method by which such unusual hazards can be removed or minimized so that unavoidably exposed persons may have a reasonable degree of protection. Indeed, it is obviously imperative to consider ways and means by which these peculiar hazards may be removed or lessened because it is not economical to spend much time and money in educating nurses and medical students, and incidentally, in the process to reduce their efficiency through illness that might very well be avoided.

Strange as it may seem, there appears to be among physicians and nurses in medical departments an exemplification of the old adage, "familiarity breeds contempt." It is generally recognized that surgeons and nurses in surgical departments have gradually evolved and developed a surgical technique for operating room procedures that is to a high degree satisfactorily effective in controlling infections. Their technique for use in hospital wards for surgical dressings and the like, while commendable, has not yet reached as high a degree of efficiency.

It is of interest to note that practically all of this surgical technique has been developed since the beginning of the present century. Dr. Arthur J. Cleveland, London, England, in an address, quoted in the September issue of *The Clinical Journal*, stated that a leading firm of manufacturers had given him the following information as to the early use of India rubber gloves: "Rubber gloves were pioneered into surgery by Halsted of Baltimore, in 1890. Rubber gloves for post mortem work were sold by this house made from sheet rubber, and their use advocated by various surgeons, among them Lynn Thomas, who in 1899 said he was astonished to find the use of rubber gloves in surgery was not general in London. This house started the sale of thin moulded rubber operating gloves in 1899 and they were figured in our catalogue of 1900."

For some years rubber gloves were not found to be altogether satisfactory because the rubber was so thick that the surgeon's sense of touch was lost. It was not an uncommon occurrence for a surgeon to remove the glove in the middle of an operation so as to better judge conditions by the use of the bare fingers. Some can also recall that at one time white cotton gloves were tried. Masks and hoods were a still later innovation, while such a refinement as what is known as the "Lane Technique" was unknown for some years.

It is important to note that in this development of the modern surgical technique the objective was entirely the *protection of the patient*. And on the other hand it is also to be noted that in other hospital departments, such as wards, laboratories, outdoor clinics, etc., where the protection of the patient has not been a considered factor, there has been comparatively little attention paid to the matter of controlling infecions. So much is this the case that it may be confidently stated that physicians and nurses on medical departments are far behind surgeons and nurses in surgical departments in the degree of attention paid to the prevention of the spread of infections. This may have come about because the risk to the patient in a medical department has not been so obvious, and few physicians have given consideration to the importance of *the protection of those who are unavoidably in contact with the sick*, such as physicians, nurses, orderlies, medical students, and all others whose duties bring them into areas in which infections are probably present.

Since, therefore, attention has been directed to the fact that these unavoidably exposed persons suffer from an undesirable hazard is it not logical to think that physicians and nurses in medical departments should endeavour to develop a type of medical technique that would be efficacious in preventing the spread of infections? Obviously where the infection is there is also the hazard. It is not possible to eliminate the infection because the infection is in the patient and in his immediate environment, but it should be possible to prevent, or at least to reduce, the liability of its transmission from the patient to those who must be in intimate contact with the patient, and who are therefore subject to the hazard.

This is not a new or original suggestion. Some degree of attention has been given to the subject here and there. For example, the better type of isolation hospitals have interested themselves to the extent of developing what has come to be known as "isolation technique." A few sanatoria for the tuberculous have introduced this type of technique, and in a few instances general hospitals have used similar methods on wards where there were known cases of pulmonary tuberculosis, or some other known cases of contagious disease.

But generally speaking, there has not as yet been developed what may be called a universal interest, at all comparable with the interest which surgeons have stimulated in operating room technique. The surgeon recognizes a personal responsibility for *the protection of his patient* from infection. Operating room nurses would feel in disgrace if a patient became infected through any lack of precaution on their part. Consequently, they have made operating rooms places requiring the observance of a strict ritual on the part of all who would enter.

Is there any reason that the physician should not recognize a similar personal responsibility for the protection of those whose duties bring them into intimate contact with his patient? Is it not quite time that a general effort should be made to develop a medical technique that could be used universally wherever there is the probability of an extra hazard from the presence of infectious material? When it is remembered that it has taken at least a third of a century to develop the present recognized surgical technique for operating rooms, one need not be unduly hesitant about the presentation of a few primary observations as to what a desirable medical technique should include—since one may be confident

that once many minds are directed to the problem development may be expected to take place with reasonable rapidity.

It may be postulated that there are five outstanding essentials:

(1) Adequate instruction
  (a) to patients
  (b) to attendants.
(2) Care of the person—particularly the hands.
(3) Adequate facilities for washing the hands—by attendants.
(4) Rational use of protective coverings—such as uniforms, gowns, masks, caps, gloves, etc.
(5) Prophylactic immunization.

Adequate Instruction

Adequate instruction is needed both by the patient and the attendant. It should be given at the time of admittance to all patients who are competent to receive it, and who are physically able to coöperate. It is given with better effect if a specially trained nurse be assigned to this duty,—one who is able to impart knowledge, to secure interest and coöperation, and to stimulate the effort to minimize the spread of infection. Certainly, at least, all those with a respiratory complication—anything from rhinitis to bronchiectasis—should be required to cover the nose and mouth when coughing or sneezing, and care should be enjoined on all who have a discharge that it may not be a source of infection to others.

As a people who consider that they have attained a high degree of advancement in sanitary measures we have woefully failed in the control of excretions from the mouth and nose. This is the more remarkable because, as spreaders of disease, these excretions are perhaps just as dangerous as any others. There have, of course, been attempts made to control spitting in public places, but the results have not shown that these efforts have been strikingly effective. There are few who are free from blame in respect to violations of the sanitary code in this respect. Moreover, those who are the more cultured or refined recognize that they have been at fault when they cough or sneeze in the presence of another person, and feel that some gesture of apology is due, as is shown by the common exclamation on such occasions, "Excuse me." But such a gesture does little to protect those present from the risk of infection. Is it to be that we must acknowledge defeat in this matter, as did a prominent M.O.H. who declined to undertake a programme of educational publicity about covering the nose and mouth when coughing or sneezing, and who gave as his reason that he made it a rule never to advocate or promote any measures which his judgment told him were due to be failures. There is need for reconsideration of this attitude. If the objective is desirable surely methods can be devised whereby the objective can be attained.

Instruction should be given to nurses, attendants, and medical students before they begin their duties or studies, and should be repeated from time to time. The instruction should consist of all that is set forth in these preliminary suggestions, as well as additions that may be developed. These groups should be made infection-conscious just as it is the custom to make everyone who wishes to enter an operating room aware that they are sources of danger unless they observe meticulously the generally recognized precautions. These groups should be taught to be on guard in the case of every patient who has a potential source of infection, and to be particularly careful when in places where infections are likely to be found. Above all, they should be made to understand that *their own hands* are the most frequent carriers of infection.

Care of the Hands

There is much need for re-emphasizing the part played by the hands in carrying infections from one person to another. A very clear exposition of the danger arising from the hands has been given by Price[4] of Baltimore, who has shown that by prolonged or frequent exposure of the hands to contamination they may become chronic carriers of virulent organisms. *Transient* bacteria lie on the surface, or are loosely attached along with the dirt by fats. *Resident* bacteria are more firmly attached, and are difficult to remove or kill either by detergents or germicides. This is recognized by surgeons who discard the scalpel by which the skin incision has been made. They know it may have become contaminated.

On the contrary, the transients are removed or killed with comparative ease. As it is the transients that are of most concern to those unavoidably in contact with the sick, the method of cleansing advocated by Price is of importance. He recommends scrubbing with a stiff brush in warm soapy water. Rinsing without friction is much less effective. Scrubbing for seven minutes will remove all of the transients and about half the residents. Thus, for routine use, scrubbing for a shorter period than seven minutes is probably sufficient, as it has been shown that the pathogenic bacteria are more numerous in the transient group. The value, therefore, of frequent such scrubbing of the hands is apparent. Moreover, it should be impressed on all nurses, attendants, students and others that until the hands have been so washed they should be kept away from the face, where are located the obvious common portals of entry.

Facilities for Hand Washing

This brings into prominence the need for the provision of adequate facilities so that physicians, nurses, students and others may have at hand the conveniences for hand washing without having to travel long distances to accomplish this purpose. In hospital wards where there are utility rooms with plumbing connections, it should not be difficult to add needed conveniences. Adequate facilities for groups of medical students may present greater difficulties but they are not unsurmountable.

Protective Coverings

As has been noted, some of the better isolation hospitals have developed what is known as "isolation technique." A few general hospitals and some sanatoria for the tuberculous have adopted this method also. Gowns, hoods, masks and gloves are worn by all who have to be in contact with the sick.

It may be that this will prove to be the proper and necessary procedure to be followed by everyone who has necessary contact with the sick. There are a number of clinicians who hold this view. Greer[6] instituted what he termed a strict medical aseptic technique to apply to all who come in contact with tuberculous patients—nurse, student, physician, other hospital personnel, and visitor alike. Gowns, hoods, and masks were to be used by everyone in contact with the patient. Stiehm[7] also carried out a rigid technique in a general hospital and reported that in a period of five years there had not been a single case of active tuberculosis among 76 pupil nurses, and only one case among 500 medical students, each of whom had some degree of contact with tuberculous patients. Myers of Minneapolis also has advocated the practice of "isolation technique" for those who have to attend tuberculous patients.

But, while isolation hospitals and sanatoria for the tuberculous are being considered as presenting special hazards, what is to be said about general hospitals? In these there are unrecognized cases of tuberculosis, as well as many cases with other infections. Should not those who are unavoidably in contact with these be given every measure of protection available? As said before, the "isolation technique" may be the ultimate necessity, but before that conclusion is reached it may be well to consider and try a modified technique more generally applicable.

The "isolation technique" has an undesirable psychological effect on the patients. It is recognized that to get the best results it is necessary to have the coöperation of the patients wherever possible. This cannot be had where it is obvious to the patients that those attending them are distrustful.

For this reason a modification of the "isolation technique" as it pertains to gowns, masks, gloves, etc., is suggested for consideration and trial.

Instead of the "allover gown" the ordinary uniform answers satisfactorily for most purposes. It is desirable, however, that this uniform, worn by the nurse while on duty, should not be worn when she goes to meals, or when she goes to any part of the nurses' residence. It is, therefore, desirable that adequate space should be provided, with facilities for hand washing, so that the nurse may remove the hospital uniform, hang it up, wash her hands, and proceed to a second room to don a second uniform which she uses when off duty. This entails some trouble but it is well worth while.

Masks. There are from time to time cases on the wards of such a kind that it is desirable for the nurse to wear a *mask*. Some patients are careless, some are not intelligent, and some are not physically able to be as careful as is desirable. Gauze masks are themselves possible sources of danger. There is tendency to take them off, put them down in a convenient place, and to use them a second time. Thus they may become contaminated, or the nurse may not get her own on the second occasion. If they are washed there is always doubt as to whether the washing has been thoroughly done. These disadvantages are all overcome by using paper napkins as masks. Fastened over two tapes, one at the top and one at the bottom, with paper clips, they serve every purpose. They keep the nurse's hands away from her face, they cover the nose and mouth, and they prevent the nurse's face being sprayed if a patient should cough or sneeze. There is no need to use a mask more than once as the cost is not appreciable. When discarded, the mask can be folded and put in a paper bag used as a receptacle—and the bag with its contents can be readily burned.

Overall gowns. There are some cases in hospitals where it may be desirable, in addition to the foregoing, to use the "overall gowns". This is necessary with careless or helpless patients—but their use in only such cases does not have the same undesirable psychological reaction, which develops in the minds of patients when this type of gown is used in all cases. Overall gowns should be handled exactly as in the "isolation technique."

Gloves. Gloves may be advisable in some cases.

These primary essentials should be available, not only for nurses, but also for orderlies, attendants, medical students, and even physicians. Adequate instruction is of the same importance in all these groups.

Medical students whose duties call them to the wards of a hospital, where they are required to handle patients or patients' clothing, should be instructed to observe all of these precautions. Moreover, the methods in use in schools of anatomy, postmortem rooms, and laboratories need to be critically scrutinized with the object of eliminating dangers that may arise from lack of cleanliness or careless technique. Above all, it is perhaps the case that, except in schools of anatomy, the facilities available for students for the washing of hands is entirely inadequate or even entirely absent. Such facilities should be provided.

There will, of course, be the usual objection that all of this will cost some money. So it will. But illness also costs money, and so does loss of time on account of illness—loss to the institution and to the individual. The loss to the latter is often very serious, as it sometimes amounts to a permanent loss of health.

Immunization

Some clinicians are of the opinion that vaccination affords some degree of protection against certain infections. This is probably conceded in the case of smallpox, typhoid fever and diphtheria, but not entirely so in the case of influenza, the common cold, pneumonia, and certain other types of infection. Some clinicians, further, are of the opinion that the hazard for those unavoidably in contact with tuberculous patients is greater for the tuberculin-negative-reactors than it is for the tuberculin-positive-reactors. Soper and Amberson[1] reported that many surveys, but not all of them, seemed to bear out this opinion. Some clinicians believe that the risk for the tuberculin-negative-reactors is so great that these should be converted into tuberculin-positive-reactors as rapidly as possible. This can readily be done in a period of six to eight weeks by the use of B.C.G.

In cases, therefore, in which immunization is believed to be of value there is no reason to withhold this advantage from those unavoidably in contact with the sick.

It is to be kept in mind, however, that even immunized persons are not protected against too great or too frequent infections—whether the infection be that of typhoid fever, smallpox, diphtheria or tuberculosis.

Results

In the Toronto Hospital for Consumptives, where these measures have been in use for the last four years, there has been a noticeable reduction in the incidence of disease and in the amount of time lost on account of illness. From 1934 to 1938, with 600 to 650 patients, among 720 nurses, all of whom served on the wards for at least three months continuously, and 50 per cent of whom served for varying longer periods up to five years, there were discovered only six cases of active pulmonary tuberculosis—a percentage of .83.

The loss of time through illness is indicated in the following table:

Group	Loss of Time on Account of Illness 1938 — T.H.C., Weston		
	Working Days	Days Lost by Illness	Pct. of Days Lost
Graduate Nurses	31,129	649	2.0
Pupil Nurses	7,341	71	0.9
General Employees	62,415	550	0.9
All Workers	100,885	1,270	1.3

These results are encouraging and stimulate further enthusiasm in the development of a rational medical technique.

Conclusion

It is obvious that however any medical technique may be developed or perfected it will be of no avail for the *protection of unavoidably exposed persons* unless it is carried out with a thoroughness and continuity comparable to that observed in all first class operating rooms. But even a 50 or a 75 per cent efficiency would be well worth while.

The subject is certainly worthy of careful consideration by physicians, teachers in medical schools, hospital superintendents, and nurses in medical departments. If a combined effort is made there is no reason to think that a *Rational Medical Technique* will not be evolved that will be sufficient to make the places, to which nurses, medical students, physicians and other hospital personnel are called by their duties, safe places in which to work.

To say that this cannot be accomplished is but to acknowledge defeat. What surgeons and nurses in surgical departments have accomplished, surely physicians and nurses in medical departments can also accomplish.

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Ninth Annual Report

of the

Tuberculosis Committee, American Student Health Association

For the Year 1938-39*

TUBERCULOSIS case finding among students of American colleges and universities is increasing in scope, quality and results. The time may arrive when this Committee will be forced to present an Annual Report that concedes a plateau has been reached, and that progress is halted in the enlistment of new schools in the ranks. Up to the present the advance has been steady, however, and the Ninth Annual Report is no exception. There is encouraging, even surprising headway to be recorded for the academic year that ended June 30, 1939.

Instead of 104 colleges reporting case finding two years ago, or the 133 in that category last year, we can congratulate 165 institutions able to tell of significant work accomplished during 1938-39. This is phenomenal growth for so short a period.

Before presenting and analyzing the replies to our annual questionnaire sent to all important American institutions of higher education, the Committee feels called upon to express once again, more fervently than ever, deep appreciation of the assistance rendered by the National Tuberculosis Association. Thanks is due the managing director, Dr. Kendall Emerson, and a long list of his aides, for an even longer list of helpful and kindly acts during the year. We are indebted to N. T. A. officials for time, advice and financial aid. They have won us interest at many doubtful colleges by bringing the problem to the attention of local tuberculosis agencies. As a result, the latter were able to establish contact with college authorities—always a much more effective medium than correspondence—which helped to iron out the difficulties inherent in any beginning program of tuberculosis control.

We must express our appreciation, too, of the kindness shown us by all who answered our questionnaire, whether they were able to report work in progress or not. Their interest, friendliness and support presage the continued success of the Committee's future efforts. If our reports shall serve as a clearing house of information and a medium for the exchange of experience, those who have coöperated should find their courtesies returning to them in the form of benefits.

Today's meeting, at which we are privileged to listen to such leaders as Dr. Emerson, Dr. J. Burns Amberson, Jr., and Dr. Herbert R. Edwards, is another high point in a successful twelve months. An earlier peak was marked by the Sixth Annual College Hygiene luncheon, staged by the Committee during the 35th annual meeting of the N. T. A. in Boston last June. Dr. Henry C. Sweany, Medical Director of Research at the City of Chicago Municipal Tuberculosis Sanitarium, addressed 115 enthusiastic delegates on "A Message from the Dead." Presiding was Dr. Henry D. Chadwick, of Waltham, Massachusetts, a member of our Advisory Committee, subsequently elected President of the N. T. A. Dr. Sweany's paper provoked so much interest and discussion that what had been intended as a luncheon session threatened to last most of the afternoon. The challenging paper has been published in the JOURNAL-LANCET, and is already available for distribution to all American colleges and universities through generous action on the part of the N. T. A.

Three parts comprise the endeavors of the Tuberculosis Committee. The first has to do with the formulation of a workable outline for tuberculosis control among college students. As in the past, the Committee draws attention to the fact that though broad general principles can be stated, individual programs must be built on the spot, out of the materials there available. We feel that the recommendations of the Committee as they appeared in the "Proceedings of the Second National Conference on College Hygiene, Washington, D. C., 1936," are far from out-dated, and that they can be used safely as a guide by any school planning the inauguration or revamping of a tuberculosis program.

Secondly, several of the sectional meetings of the American Student Health Association have reported papers or round tables on the subject of student tuberculosis, but, in general, this promising phase of our activities has not been realized or utilized by sectional executives. Although for two years an appeal has been issued to have someone in every section detailed to work with the Tuberculosis Committee in the capacity of a local representative, we have heard of only one such appointment. Once more we urge each section president to select a member of his district organization as a liaison officer to stimulate the work in colleges of his own area. The chairman should be notified of these appointments. So much more intimate and effective discussion of case finding techniques and results can be carried on at the relatively small section gatherings than is possible at the larger national meeting. Local problems, met with local experience, and handled well within the bounds of local facilities, will reach solution more readily than where only long-range, centrally inspired and directed methods are brought to bear.

Richly deserving the accolade of this association is the sorority of Sigma Sigma Sigma. The society has chapters in 32 colleges, and, under the name of the Clara Barton Higgon Memorial, has pledged itself to promote tuberculosis case finding nationally, though most particularly where Tri Sigma is represented. Mrs. L. O. Carson, Alexandria, Virginia, chairman of the

*Presented at the twentieth annual meeting of the American Student Health Association, December 28-29, 1939, New York, N. Y.

committee assigned to this work, reports programs already under way in 17 of the 32 teachers colleges wherein a chapter of Tri Sigma is concentrating on the problem.

Following the precedent set at last year's meeting, a preliminary draft of this Ninth Annual Report is in the hands of those attending today's session. In abridged form it presents a preview of the data that will appear some months hence in the Journal-Lancet, to some extent narrowing the hiatus between the presentation here and the appearance of the printed report. A selected list of references is appended. This does not pretend to be complete, but should be helpful to those wishing to consult authorities who have contributed articles during 1939 relevant to the general matter of student-age tubercuolsis.

Approaching the third portion of its duties, the collection and publication of statistics concerning tuberculosis among American college students, the Committee again presents several challenging facts. It seems wise, however, to begin with a prefatory note of warning with regard to the figures that appear in the report annually. They have not been and will not be advanced as exact computations. Rather, they represent a compilation of statistics from hundreds of different sources, so that many elements of personal interpretation, even of error, can be predicted. Granting that a certain degree of cancellation of error must occur during such a process, we still maintain that our tables are meant to indicate trends, not to supply exact ratios and percentages. Thus, if we are able to report a steadily falling percentage in the reactors to tuberculin throughout collegiate America, it is no accident or artefact, since identical methods of collecting the figures have been in vogue for several years. However, it would be a serious mistake for anyone to employ our figures as conclusive statistical calculations, or to quote us as alleging, for instance, that the percentage of positive tuberculin reactors is exactly thus-and-so. One purpose of our annual study will have been fulfilled, we believe, if we can indicate beyond shadow of doubt that colleges with tuberculosis programs in operation succeed in discovering a vast amount more tuberculosis each year than do those schools not yet embarked upon such projects. If so, we have scored a legitimate point. The exact number of cases found may be open to argument, but the fact of their being found in the first group of schools and their not being found in the second is the more important consideration.

In a word, then, the Committee presents its figures annually with the idea of tracing trends, recording progress, never of posing as a court of final authority upon such absolute matters as "infection rates," "cases of active tuberculosis per 100,000 persons examined," and the like. Carefully conducted surveys at individual schools may be used quite acceptably as criteria by which to reckon the state of affairs in a surrounding community, among parallel age groups, or within comparable social strata. Our report, on the other hand, for some time to come, must be reconciled to bulking the returns from California colleges with those from colleges in New England, those from a large university possessing an almost ideal set-up with those from a small institution whose program is only beginning to achieve reasonable standardization. It is gratifying to note, in this regard, that we were forced to discard the returns from only eleven colleges this autumn. All others had forwarded data satisfactory for the purposes of this report.

Efforts being made elsewhere within the American Student Health Association to encourage reasonable uniformity of examination procedures, content of clinical forms and record systems, meets with the hearty approval of the Tuberculosis Committee. Adequate records of the results of tuberculin testing, X-raying of chests, and other follow-up, can be completed very easily at the time such work is being done. Simplified filing procedures have been recommended by us during recent years. Where such methods are adopted, there is no uncertainty concerning the status of tuberculosis control within that college at any stage during the term. There is need for neither a large clerical staff nor an elaborate or bulky filing facility. The cost is negligible, confined to that of a few hundred 3x5 or 4x6 inch cards, index tabs, and the drawers to hold them. The larger group of cards will be those of the negative reactors, kept in one file, and ready for the re-testing process when that time arrives. In a second file are the cards of the positive reactors, separated into two parts—those who have completed their chest X-rays, those that are still to attend to that necessary step. A small handful of cards may represent students whose films have revealed something deemed suspicious within the lungs, and who are scheduled for close scrutiny at frequent intervals. Finally, a very small number of cards may be segregated, to account for individuals who withdrew from college because of lesions that required intensive care. If such a simple and inexpensive system be installed, it will be found to require a minimum amount of work to keep it operating smoothly. Daily, it is a joy and a help to the doctors who must supervise the program. At year's end it serves as the basis for speedy computation of results to be reported in the health service's annual report to the college administration, while it is the source, too, of the information requested annually by this Committee.

Table I reveals that questionnaires were sent to approximately the same number of colleges and universities as a year ago. As a matter of fact, they went to virtually the identical schools. We were encouraged to receive replies from considerably more institutions—an increase of 18.5 per cent. Even more heartening was the fairly even spread over the nation, along with the splendid swelling of the total of schools with some form of tuberculosis control. As already mentioned, there are now 165 colleges in this class, as compared with 133 last year, or an increase of 24 per cent. So sharp a rise can hardly be hoped for annually, but we are delighted to note that among those schools replying to the questionnaire yet having no formal program to report, 13 tell of programs starting in the fall of 1939, while 8 others mention that they have definite plans in mind, and hope to see these come to fruition soon, if not during the current term.

TABLE I.
Questionnaire Survey of Tuberculosis Case Finding in American Colleges and Universities, 1938-39:

	Blanks Sent	Replies Received	TB Programs Reported
Canada	1	0	0
Total	1	0	0
Maine	7	2	1
New Hampshire	7	1	1
Vermont	6	1	1
Massachusetts	41	14	10
Rhode Island	4	2	2
Connecticut	12	6	3
Total	77	26	18
New York	54	17	10
Pennsylvania	68	15	12
New Jersey	20	8	8
Delaware	1	1	0
Maryland	17	2	1
District of Columbia	9	0	0
Total	169	43	31
Virginia	20	7	2
North Carolina	23	15	4
South Carolina	15	1	0
Georgia	15	3	2
Florida	7	1	0
Total	80	27	8
Oklahoma	16	4	2
Arkansas	11	1	1
Tennessee	26	3	0
Mississippi	10	6	5
Alabama	13	3	1
Louisiana	11	1	0
Texas	33	10	3
Total	120	28	12
North Dakota	9	5	4
South Dakota	8	5	2
Minnesota	21	7	7
Wisconsin	24	14	8
Michigan	24	5	4
Ohio	48	25	16
West Virginia	14	4	2
Indiana	27	20	9
Illinois	44	10	4
Iowa	25	6	4
Nebraska	16	3	1
Kansas	20	9	7
Missouri	26	8	3
Kentucky	15	4	4
Total	321	125	75
Montana	6	3	2
Idaho	3	3	2
Wyoming	1	1	0
Nevada	1	1	1
Utah	4	1	1
Colorado	9	4	1
Arizona	3	2	1
New Mexico	4	1	1
Total	31	16	9
Washington	14	3	3
Oregon	10	4	3
California	34	10	6
Total	58	17	12
Grand Total	857	282	165
Previous Year	852	238	133
Two Years Ago	819	233	104

A moment's study of tables II and III will show that, as in the past, our replies have come from every size and type of institution, and that tuberculosis programs are not confined to any one class of schools. It must not be overlooked, however, that the good news is matched to considerable extent by the complete silence greeting our annual letter-visit on the majority of campuses circularized. A great deal of hard, unrelenting work and much persuasive effort lies ahead if these gaps in our eventually united front are to be closed. It is not fair to dismiss the non-coöperators with an off-hand statement that they likely represent small, unimportant, unprogressive or financially weak schools. Our lists disclose many a powerful and respected institutional name among those whose officers have not seen fit to assist us even to the extent of returning a negative reply or a blank questionnaire. It must be admitted, at the same

TABLE II.
Enrollment of Institutions Coöperating in Tuberculosis Survey

Enrollment:	Number of Schools 1937-38	1938-39
Less than 500 students	78	90
500 to 999 students	52	78
1,000 to 1,999 students	40	42
2,000 to 2,999 students	15	20
3,000 to 3,999 students	10	10
4,000 to 4,999 students	5	9
5,000 students and over	19	26
Enrollment not given	19	7
Total	238	282
Total student enrollment	386,101	478,574
Total reported eligible for Health Service	275,448	352,638

TABLE III.
Tuberculosis Case Finding as Reported in Various Classes of Institutions of Higher Education

Type of School:	Schools with NO TB. Program 1938-39	Schools with SOME TB. Program 1938-39
Private Endowed Colleges	68	58
Endowed Universities	13	20
State Universities	8	24
State Colleges and Institutes	8	19
State Normal and Teacher's Colleges	18	37
Civic Colleges and Universities	2	7
Total Reporting, 1938-39	117	165

time, that a large number of tiny colleges, most of them devoid of any semblance of student health service, forms the bulk of the non-participating group. We hope, through personal appeals launched by local tubercuolsis agencies, to witness interest engendered in many of these schools, so that gradually the amount of one-way correspondence on our mailing list may be whittled down.

In table IV we see that the Mantoux intradermal technique remains the testing method of choice, though three schools cling to the von Pirquet test—some be-

TABLE IV.
Details of Tuberculin Testing in Various Institutions

	1937-38	1938-39
Number of Colleges Reporting Some Tuberculin Testing in Progress	116	143
Method Employed:		
Mantoux Intradermal Technique	109	136
Von Pirquet Cutaneous Technique	1	3
Vollmer Patch Test Technique	0	4
Not Specified	6	0
Type of Tuberculin Used:		
Purified Protein Derivative	63	79
Old Tuberculin	46	55
Patch (?)	0	4
Not Specified	7	5
Number and Strength of Test Doses:		
P. P. D. up to 0.005 mg. or O. T. up to 1.0 mg.	82*	82
P. P. D. not over 0.00002 mg. or O. T. not over 0.1 mg.	28*	39
Von Pirquet, Patch, etc.	1	7
Not Specified	6	4
Groups Subjected to Test:		
a. Students:		
New Students only	33	45
Annual Re-test for Negative Reactors	44	59
New Students, with Re-test for Seniors	6	4
Any Student, Entirely Voluntary	18	26
First Test Required, Subsequent Tests Voluntary	4	0
Special Hazard Groups only (Nursing, Medical Students, etc.)	4	5
Not Specified	7	4
b. Non-Students:		
College Food Handlers (Required)	48	71
Faculty, Clerks, Other Employees (Mostly Voluntary)	38	49

*One school has been experimenting with either method.

cause they are dependent upon state supplied materials —and four others this year have decided to try out the Vollmer patch test.

The attitude of the Committee remains unchanged. We welcome any and all attempts on the part of member schools to discover new and reliable case finding weapons. Until these have been tried thoroughly and proved superior to present methods, however, we shall continue to advocate methods that promise to discover the maximum amount of tuberculosis among students or student contacts on the campus. Definitely, we are interested in easier methods, but we shall endorse none unless it be proved at least as reliable as those now recommended.

The last report listed several objections to the patch test as it is at present administered, ranging from occasional allergic reactions to the adhesive material, through premature removal of the patch, dilution by perspiration or water, modifying effects of air, to the very real drawback that, unlike intradermally introduced tuberculin, the patch material may not promise the doctor as controlled a locale within which the reaction is to take place. At that time we invited schools to experiment freely, but cautiously, with the patch test, checking results against the approved Mantoux technique, and controlling all with chest film studies. To date we have heard of two universities which have such projects under way. The director at one of these schools, in a personal communication, says he and his co-workers join the student body in admiring the ease of the test. They believe it to be roughly equivalent to the first strength dose of P.P.D. His opinion may be close to the findings elsewhere. Although we are able to report the results at only four schools, based on tests of only 3,911 students, we find that 17 per cent so tested reacted positively, while the figure for an adequate dosage of tuberculin administered intradermally at 82 schools to 54,781 students was 30.3 per cent. Much more information must be compiled before the patch test can hope to rank for accuracy with the Mantoux, though it has many attractive points for busy physicians and students alike. The most challenging question seems to be how much clinically significant tuberculosis may exist in the reactors missed by a patch test yet determined as positive by a larger dosage of tuberculin supplied in some other medium.

For several years the Committee has advocated the use of the Purified Protein Derivative of tuberculin, mainly because we hoped to secure more nearly uniform results through general employment of a product known to be better standardized. There has been no attempt to insist upon this as a vital part of the program. Although we have agreed with those who believe P.P.D. slightly more discriminatory in selecting true positive reactors, we have been confronted with the valid objection by many colleges that they could not afford the more expensive P.P.D. Nor did it lend itself well to programs where testing is not conducted fairly well *en masse,* again on economic grounds. As a result, our advice has been that colleges should use P.P.D. wherever possible, and, failing that, should use nothing but a potent, reliable brand of Old Tuberculin, such as Saranac Lake O.T. This year's returns show that P.P.D. leads in popularity, though O.T. is well patronized. Incidentally, P.P.D. prices are much more reasonable than when it was first marketed.

Analysis of the results from the 143 schools reporting tuberculin testing shows the following breakdown: 11 schedules were discarded as not usable in some respect; 11 others included those using von Pirquet, Vollmer, or unspecified methods; 39 reported dosage below that recommended for adults by the Committee; 82 had employed what we have stressed as adequate dosage, viz.: up to 0.005 mg. of P.P.D., or 1.0 mg. of O.T.

TABLE V(a).

Contrasting Results of Using Smaller or Larger Dosage of Tuberculin in Testing College Students, 1937-39.†

Dosage:	No. of Colleges	No. of Students Tested	No. of Students Positive	Pct. Positive
I. Recommended Dosage was used, i. e. at least 0.005 mg. of P.P.D., or 1.0 mg. of O.T.:				
1937-38	82‡	47,879	13,856	28.9
1938-39	82	54,871	16,662	30.3
II. Dosage did not go beyond 0.00002 mg. of P.P.D., or 0.1 mg. of O.T.:				
1937-38	28‡	13,157	2,037	15.5
1938-39	39	20,002	2,925	14.6

†It must be remembered that these were students at different institutions, but the distribution over the country was fairly uniform.
‡One school is listed in both groups: (see Table IV).

Table V(a) is one of those mentioned in our introduction. It is meant to show only one thing—that when too small a dosage is used, a very considerable mass of truly positive reactors is missed. It is not intended that the exact percentages turned up by the larger or smaller dose methods should be accepted as an absolute figure, even though they bear a fairly close relationship for two successive years. The important lesson appears to be that the single, small dose method may be quicker, easier and cheaper, but that it approaches the unreliable if our real object is to find as many infected individuals as possible. Canuteson, at the University of Kansas, has conducted an interesting research along these lines for the past three years, employing an intermediate-sized dose (0.0002 mg. P.P.D.) on some of his students, the regular two doses on the others. His results tend to show that, with an intermediately selected dose ten times the usual first strength, he can avoid severe reactions most of the time, though he fails to find a considerable number of students positive who would be positive to a routine second dose. He finds most, though not all, of his clinically significant cases of tuberculosis can be turned up by filming and otherwise studying the positive reactors to the intermediate dose. Further, when he substitutes his intermediate-sized dose for the usual first dose, he finds about 6 per cent more positive reactors than when using the conventional 0.00002 mg. This makes it necessary to administer a second test of 0.005 mg. to a smaller number of students—a legitimate saving of time and money.

Another middle western college reports that two of three early, active cases found in school during the past three years were negative to the first strength test, positive to the second. Thus, had there been no second test, these cases would have gone undiagnosed for the time being at least. The consequences to the individual, the relatives, the college and the other students had these cases been missed, may be debatable, but surely nobody can deny it was better from every standpoint, economic, social and medical, to have them discovered when they were—early. The Committee is gratified to note that 7,000 more students were tested and protected by adequate technique this year than last. The minute first strength dose does its part by finding the highly allergic and saves them from severe reactions. The much stronger second dose identifies those positive individuals who would be passed off as negative if testing halted at too low a level.

A further point of interest arises in the fact that the dosage, granted a reliable brand of tuberculin is used, rather than the specific product chosen seems important. This is indicated by examination of the results obtained by the group of schools using what has been termed above "adequate" doses. In 48 colleges using P.P.D. to at least 0.005 mg., 33,355 students were tested, with 30.5 per cent reacting positively. In 34 other colleges where the dosage of O.T. ran to at least 1.0 mg., 21,516 individuals were tested, and 30.1 per cent gave positive reactions. The difference is negligible, though again we remind ourselves that the broad fact alone is demonstrated, not the hard-and-fast ratio. (Table V(b).

TABLE V(b)
Comparison of Testing Results with P.P.D. or O.T. Where an Adequate Dosage was Employed

Product and Dosage:	No. of Schools	No. Students Tested	Pct. Positive
P.P.D. to at least 0.005 mg.	48	33,355	30.5
O.T. to at least 1.0 mg.	34	21,516	30.1

So much debate is current on the subject of tuberculin testing, that we would call to the attention of everyone interested an excellent series of articles in the December, 1939, issue of the *American Review of Tuberculosis*. These represent the material presented during the Symposium on Mass Tuberculin Testing and X-raying held during the last N. T. A. meeting at Boston. The subject is presented from several viewpoints in helpful and thought-provoking fashion, and should clear the doubt from the mind of anyone who may have been confused as to the value of tuberculin testing in a tuberculosis control project.

Returning briefly to table IV, we encounter further encouraging news. No fewer than 71 schools now insist upon testing their food handlers, as compared with 48 last year. Another advance is signalized by the making of the test available to the faculty and administrative employees of 49 institutions, contrasted with 38 in 1937-38. Those in close contact with tuberculosis work among students realize the tremendous difficulty of having faculty members and other personnel, other than food handlers, tested, or even X-rayed routinely. It seems completely illogical to make the program compulsory for students and to enforce it upon food handlers, only to expose these supposedly protected people to teachers and others who unwittingly may be spreaders of tubercle bacilli. However, we know that this practice is very generally the case, and much education must ensue before a reversal of administrative decision can be hoped for or faculty coöperation expected. The responsibility rests upon each of us who occupies a position on a campus that gives opportunity for the facts to be brought constantly before our less informed colleagues. If college professors can be convinced of the need, we have confidence they will rise to accept the obligation. If they remain ignorant of the need, we must take to ourselves much of the blame. Selfishly stated, it might be psychologically sound to ask faculty members if they are willing to do without their share of the modern health safeguards now available on many campuses for the students. The appeal to their coöperative impulses, reinforced by intimation that they are missing something vital and valuable, may be too much for them to resist.

Stiehm, at the University of Wisconsin, in a recent personal note, pointed out that more cases of clinically active tuberculosis have been found among students in that university, relatively, than among those examined when entering the school for the first time. He stresses, accordingly, the necessity for unending search for the disease among the intramural population, as it is during the years ordinarily spent in college that the critical age for the appearance of tuberculous breakdown is encountered. For this reason the Committee has emphasized the need for retesting of negative reactors at least annually, and oftener in special hazard groups such as nurses and medical students. Similarly, we feel that the positively reacting group should have benefit of repeated roentgenographic and other check-up. Table IV reveals that 59 colleges are now providing annual retests of previously negative reactors, while in Table VI we learn that 52 schools are X-raying their positive reactors annually or oftener. Other colleges, many with newly begun programs, should not be criticized if their procedures are not yet ideal. The movement toward strengthening existing programs is as important and as stimulating as our being able to list new recruits each year.

TABLE VI.
Details of Chest X-Ray Procedures at Various Institutions

		1937-38	1938-39
I.	Schools with Tuberculin Testing:		
	X-Ray Positive Reactors **Once**, with Follow-up "When Indicated"	62	55
	X-Ray Positive Reactors **Annually** or Oftener	31	52
	X-Ray Once; **Re-ray Seniors**	3	1
	X-Ray is Voluntary, **Acceptance General**	13	24
	X-Ray is Voluntary, **Acceptance Fair to Poor**	1	8
	Not Specified	1	3
	Fluoroscope: Used Exclusively, Film only "When Indicated"	5	5
	Fluoroscope: Used Supplementary to Films	22	36
II	Tuberculin Testing Waived for Special Groups:		
	Routine Chest Films for Faculty	1	1
	Routine Chest Films for Food Handlers	3	2
III.	Schools without Tuberculin Testing:		
	Routine Chest Films for Students	17	22

Table VI also shows markedly increased use of the fluoroscope as a supplementary aid to information gained

from chest films. If a good fluoroscopic unit, with a fast screen, be employed by an experienced examiner, there is no question of the value of the procedure. Areas not depicted on the flat film can be explored, densities separated and checked as to their vascular or other origin, dynamic information added to what must have remained purely static and superimposed shadows otherwise. The usual word of caution against sole reliance upon fluoroscopic examinations must again be spoken, however. Nor do we feel that the Committee can endorse minicamera snap-shots of fluoroscopic images as a time-conserving or money-saving device with which to supplant good chest films. Observers who have investigated this latter procedure in Europe report it is capable of picturing, reasonably well, most of the lung lesions except the very early ones. Since our hope primarily is to discover this last named variety of pathology, the limitations of the minicamera method in early case finding must be obvious.

There are 22 schools in our list this year where the X-ray is used to locate cases of student tuberculosis without recourse to prior tuberculin tests. For several years the number of colleges in this category has grown slowly. The larger share of these institutions report that they check their film-suspicious cases with tuberculin tests and other investigation to make certain they are dealing with tuberculous lesions. We are following the results in these colleges with great interest. Mostly, they lie in the eastern states, where the percentage of positive reactors runs high, though not reaching the two-thirds level above which it seems agreed that pre-testing with tuberculin becomes expensive and unnecessary. However, for one reason or another, 22 schools have short-circuited their case finding by resorting directly to the X-ray for the initial chest check-up. Provided there shall be guaranteed adequate X-ray follow-up of the students in these institutions, no particular fault can be found with such a procedure. One salient piece of information lacking on every student so handled, however, is whether he represents a presently infected individual or not. The tuberculin test, according to Long, can be counted on to pick up from 90 to 95 per cent of the infected. Subsequently, it is true that good postero-anterior chest films often fail to reveal grossly appreciable reasons for the tuberculoprotein allergy. Conversely, some people whose films show well-defined calcifications within the lung may have reverted to a state of anergy. Thus, the tuberculin test and the roentgenogram combine to form a splendid team. It seems wisest to couple them whenever possible. When situations arise where one or other must be chosen because both cannot be provided, naturally the film becomes the choice. Nothing strikes us as more futile, or more destined to disturb the student and alarm his parents, than a positive tuberculin reaction with no following X-ray study.

We must recall, in looking at Table VII, that we are in search of trends rather than percentages to three places of decimals. First, we note with satisfaction a goodly increase in the total number of students upon whom tuberculin tests were reported to the Committee in 1938-39. Almost six times as many young people are embraced by the program this year as in 1932-33, the first year for which we have records. Second, we see that there has been a steady decline in the percentage of positive reactors during the past seven years. This is as far as it is fair to proceed, however, as the figures have been somewhat diluted annually by necessary inclusion of all the tested, whether or not they had received the recommended dosage. Accordingly, 25.5 per cent does not represent the true incidence of skin positivity to tuberculin among American college youth today. Reference to figures already quoted when we discussed the results in 82 colleges where an approved dosage was used, gives 30.3 per cent as the positives among their students. In 1936-37 the corresponding figure was 30.5 per cent, while last year it was 28.9 per cent. It is probably quite reasonable to suppose, therefore, that the country-wide college incidence of positive tuberculin reactions will lie in the zone between 25 and 30 per cent in the age group not exceeding 25 years and barring the special hazard groups.

TABLE VII.
Tuberculin Testing of American College Students, 1932 to 1939 (incl.)

Year	Total No. Tested§	Pct. Positive	Pct. Men Positive	Pct. Women Positive
1932-33	14,318	35.0	35.0	27.0
1933-34	25,184	30.3	30.0	26.0
1934-35	26,861	29.4	30.0	27.8
1935-36	31,601	30.0	31.0	28.0
1936-37	56,224	27.3	29.4	24.8
1937-38	64,232	25.8	29.8	23.5
1938-39	82,774	25.5	27.0	24.3

§In their returns, some colleges fail to differentiate their reactors by sex, so that the total number tested is annually slightly in excess of the sum of those reported according to sex.

A new factor now operating to reduce still further the percentage of positive reactors discovered by testing of students entering colleges for the first time is that constantly more and more individuals are coming to college with a record of previous tests made in grade or high schools. Whenever these have been certified by the family physician as having been positive, the natural practice of most colleges has been to X-ray, not to retest. However, when such positives are not added to those discovered by the college's own testing procedure, a falsely low number of positive reactors among the new students is the result. The Committee will change its questionnaire to take care of this recently developed discrepancy.

Mention has been made of special hazard groups, and we shall attempt to state the position of the Committee with regard to routine BCG inoculations for undergraduate nurses and medical students. Some schools have asked our opinion, citing results claimed in certain European countries. We would be very reluctant to appear to oppose properly controlled experiments with BCG or any other ethical product. However, we feel it fair to state we have yet to be convinced that BCG vaccinations of adults result in definite prevention of infection with virulent tubercle bacilli, when, later, exposure to such infection occurs. Lurie, in a very comprehensive review, stated recently that we cannot hope for BCG to protect against serious exogenous reinfections in adults. American veterinarians, in general, have abandoned attempts to protect cattle against tuberculous in-

fection by means of BCG or other supposed immunizing agents. Our advice is that tuberculosis among nurses and medical students can best be prevented by painstaking, constant, and improving technique to minimize the chances for infection. Frequent testing with tuberculin will give an early indication of infection if such does occur. Repeated X-ray studies of the individuals who react positively, or of all in the group if so desired, will then result in discovery of pulmonary lesions in their most minimal stage. When treatment is instituted at such a stage, healing is known to be the rule, rather than the exception. We favor this method, even with its admitted shortcomings, to any mass vaccination of nurses and medical students with as relatively little understood a product as BCG still remains.

TABLE VIII.

New Cases of Pulmonary Tuberculosis Diagnosed Among College Students, 1937-39

A. In Institutions with SOME Organized Tuberculosis Program:	1937-38	1938-39
No. of Clinically Active* Cases Diagnosed	229	241
No. of Apparently Arrested* Cases Diagnosed	372	368
Total NEW Cases Reported	601	609†
No. Students Who Left College Because of Tuberculosis	134	151
No. of Institutions Reporting	133	165
Approximate Total Enrollment	261,949	348,713
B. In Institutions with NO organized Tuberculosis Program:	**1937-38**	**1938-39**
No. of Clinically Active* Cases Diagnosed	5	4
No. of Apparently Arrested* Cases Diagnosed	8	15
Total NEW cases Reported	13	19‡
No. of Students Who Left College Because of Tuberculosis	5	4
No. of Institutions Reporting	105	117
Approximate Total Enrollment	123,847	129,851

*Colleges were requested not to include so-called childhood or primary tuberculosis cases. Generally recognized criteria of activity were specified.

†These colleges also knew of 320 OLD cases back in school under close observation.

‡These colleges knew of 10 OLD cases back in school.

In table VIII we come upon the final word in the argument over the worth of tuberculosis case finding. The first half of the table presents the excellent results obtained both in 1937-38 and 1938-39 in those colleges and universities which have established tuberculosis programs. Even though many of these schools testify frankly that their programs are not yet complete and may not cover all the students registered on their campuses, we find them able to report for the two years, 229 and 241 new cases, respectively, of what they determined to be active, pathologically progressive pulmonary tuberculosis according to the recognized standards of activity. They also turned up 372 and 368 cases, respectively, of what they felt satisfied were newly found, arrested, inactive cases of the disease. In addition, this last year this group of colleges has had no less than a further 320 old, arrested cases back in school under close observation. Growing out of the case finding effort, withdrawal from college on account of tuberculosis was recommended to and accepted by 134 and 151 individuals in the respective years.

Some may interject the comment that some of these cases may not have been pulmonary tuberculosis, or that some may have been thought active that were not truly so. Even if we grant that X-ray or clinical interpretation might err in a small percentage of the cases here reported, we must claim in the same breath that the error was in the direction of safety, of public health, and not toward haphazard chance. Furthermore, from the data accompanying the returns from these progressive institutions where tuberculosis is being diagnosed in its early, preclinical stages, we gain the impression that the medical staffs very definitely have their feet on the ground, and are applying all the criteria demanded by leading clinicians and the National Tuberculosis Association.

When we examine the lower half of table VIII, a different state of affairs greets us. Here, in either of the two years, no more than a scant handful of cases reached a diagnosis. Instead of several dozen cases, both active and arrested, that we should normally expect to have been found among the considerable enrollment represented by this large group of colleges, we learn there have been only 32 cases of all kinds diagnosed in the two-year span, 9 of whom left college because of their tuberculosis. These cases, we find from the comments appearing on the questionnaires, were diagnosed incidentally. Either they were being checked for some other reason, or they came to the physician complaining of well developed symptoms that aroused suspicion, later led to diagnosis of tuberculosis. Obviously, there was slight chance of these cases being found in a preclinical phase. They were found because they could no longer be missed.

What the situation may be in the several hundred colleges that do not go so far as to return our annual blanks is subject for anyone's conjecture, but we can venture to predict that it is not even on a par with conditions in the second group where tuberculosis occasionally is found in spite of the lack of modern case finding techniques.

Last year we included quotations from letters received from various college presidents, deans, and even college physicians. They represented a fair cross-section of the lack of information on tuberculosis to be encountered in otherwise well informed people. We could duplicate every one of last year's quotations with another just as startling, but space forbids. Fine, earnest men who would spring to instant action in the presence of some dramatic menace such as smallpox, typhoid, diphtheria or infantile paralysis, blandly write of having no tuberculosis at their colleges for uncounted years, of selecting their students so carefully that tuberculosis cannot occur, of avoiding tuberculosis by having each student bring a certificate of physical fitness from home. Others tell of cases that did occur among some of their graduates shortly after leaving college, but that, according to their reasoning, are to be charged to some post-college mischance. Still others cling to the notion of "thorough" physical examinations that they count upon to rule out the tuberculous student, even though expert medical opinion holds that this is not merely a forlorn hope, but also an outdated gamble. It may be a poor analogy, but we can visualize the misgivings these same intelligent leaders would experience were they to apply to a doctor to determine if they had diabetes, only to find that his

examination did not include a urinalysis or a blood sugar determination.

It is neither our place nor our purpose to ridicule naive beliefs that may still be cherished with regard to tuberculosis. These beliefs, as hinted by the recent Gallup poll on tuberculosis, are widespread. It is our task and that of everyone connected with medicine, public health and the teaching of students to extend our efforts so as to include the men and women who are charged with directing our colleges and universities. They are among the leaders of America, and through their hands are passing tomorrow's leaders. We must shatter the notion still popular that tuberculosis is to be diagnosed from symptoms and signs—always the *late* evidences of a ravaging process. In its place we must set up the idea that there are available sure, easily workable, inexpensive methods of finding tuberculosis when it should be found—in its *early,* curable stages, months or years ahead of those signs and symptoms our fathers and grandfathers associated with "consumption."

As a slogan for 1940, or for so long as we shall need it, the Tuberculosis Committee suggests: *"Educate the educators concerning tuberculosis!"*

Respectfully submitted,

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Dividends from a Tuberculosis Control Project Among Students

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SINCE the concern of the college and university is not merely with the mind of the student but with the whole individual, supervision of the student's health, discovery and solution of his physical, emotional and mental problems, and education to develop and preserve the healthy body for the healthy mind are parts of the fulfillment of the opportunity and obligation. Thus the beneficent influence of the institution is extended and perpetuated not only through the years of student life, but also through entire life. With regard to tuberculosis, the obligation is inescapable if we acknowledge the soundness of modern concepts of the disease and visualize their possible and practical applications.

An understanding of the problem and of the objectives of tuberculosis control is obtained by consideration of the situation prevailing currently throughout our country. Approximately 5 per cent of all deaths are caused by tuberculosis. It may be estimated on the basis of tuberculin tests that at least 50 per cent of the whole population is infected with the tubercle bacillus. It has been estimated, therefore, that approximately 8 to 10 per cent of those infected eventually die from the disease. Although exact figures are not available, it is probable, according to these experiences, that two to three of every 100 college students are destined to die from tuberculosis. Is this inevitable? There is ample evidence to indicate that it is not.

Studying the situation further, it is well known that relatively few deaths from tuberculosis occur before the age of 15. Between the ages of 20 and 29, there is a sharp rise in the mortality rate; and in this decade tuberculosis causes 17 per cent of the deaths among males and 24 per cent of those among females. In 1935 in the United States, about 15,000 people in this age group died of the disease, and 47,000 in all age groups beyond 30.

Going still further, experience is accumulating to show that most disabling and fatal lesions of tuberculosis put in their appearance in the lungs between the ages of 20 and 30. While the disease may develop at any age, most cases evolve apparently from lesions which could have been readily identified in the third decade of life. Were the lesions diagnosed and treated at the time of their first appearance, most of them would heal. Otherwise, they usually progress rapidly, or insidiously and slowly. Following this early development, they often subside into a latent phase, lasting for many months or years, and it is the reactivation of such latent foci in middle or old age which appears responsible for most of the illness and death then.

The cost of the fatal case of tuberculosis can be imagined easily. Disabling illness usually lasts for two to five years before death, not to speak of the minor episodes which may antedate disability. The medical and nursing costs are about $1,000 for each year of illness. Earning power is at first diminished, later lost. Havoc is wrought in the family, socially, emotionally and economically. During the insidious phases of development, infection frequently is passed to the healthy members of the family.

Prevention is possible, and is approached by the accepted procedure of tuberculin testing of students on entrance, and preferably retesting non-reactors each year during residence. Tuberculin reactors should have roentgenograms of the chest on entrance and preferably once a year thereafter during residence, since this is the surest way of detecting early newly developing lesions. Lesions disclosed should be appraised not merely by their immediate effects, but also by intelligent estimation of their eventual potentialities. The possibilities of progression into advanced disease before the appearance of classical symptoms is to be appreciated. Generally there is too great a tendency to observe the lesion until progression has actually occurred, in which cases the maximum opportunity of cure is lost. The purpose of treatment is not only to arrest a peripheral extension of the lesion, but also to arrest the process of central caseation. Otherwise, even though temporary arrest may occur later, the central caseous residue constitutes a menace in future years. Easily recognized newly developed lesions in this age group should be given prompt treatment, usually with a preliminary period of bed rest, regardless of the absence of symptoms and because of the implications of the lesion. As a rule a year of careful treatment is needed to insure lasting arrest.

It is not possible to measure objectively what is prevented and what are the dividends gained. In view of experience, however, it is beyond argument that a tuberculosis control project well conceived and executed along these lines, prevents death from tuberculosis in the remote as well as the immediate future. It prevents long and recurrent illness which may not always be fatal. It prevents the impairment of individual efficiency and effectiveness and the consequent economic waste. It prevents mental distortions and depressions due to the effects of chronic illness. It prevents the development of open cavitary tuberculosis and the consequent infection of the individual's family and associates. It prevents in these a reduplication of the gruesome train of events experienced by the first victim.

*Abstract of address delivered at Tuberculosis Committee luncheon, American Student Health Association meeting, Hotel New Yorker, New York, December 29, 1939.

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Discussion

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There is no need to criticize the comments of Dr. Lyght or Dr. Amberson in the statements they have just made on the importance of tuberculosis among college students. Their conclusions meet with my approval and experience. I would like to emphasize two points. First, that the experience in tuberculin testing, as reported by Dr. Lyght, clearly indicates that any college population should be first screened with the tuberculin test before proceeding with X-ray examination. Secondly, I believe that it is vitally important that work of this character be under the control of the school authorities or such other qualified personnel who are familiar with this type of work, rather than being done by those less familiar with a picture of early tuberculosis.

I should like also to emphasize the importance of the radiograph, as the vast majority of those found with pulmonary pathology are completely without symptoms or physical findings. Perhaps the major problem in work of this character arises from the fact that the X-ray is costly, and there would probably be less opposition in developing such programs on a more permanent basis if this cost could be reduced. However, regardless of the cost, such work is sound and should be expanded in all colleges. I would like to emphasize, however, that intensive programs among college students are only a small part of a community's tuberculosis control program. It must be remembered that these students come from homes and communities where tuberculosis may be more prevalent. Therefore, surveys among the college students should receive the amount of attention relative to the prevalence of the disease found.

Here in New York City we have had very valuable experience over the past several years, during which time we have X-rayed over 225,000 persons. In our work, we have attempted to reach various social, economic, age and sex groups to determine the relative yield among the various groups of the population. Our experience has clearly indicated that significant tuberculosis is more prevalent among adults with low income or the unemployed than in any other groups of the population. During the past year we have X-rayed 15,627 students in our city colleges. They included almost 100 per cent of the enrollment at Hunter, Brooklyn and Queens Colleges, a lesser number at City College, and a small group at New York University. Our survey was done on the basis of an X-ray even though we were well aware it would have been desirable to use the tuberculin test and X-ray only positive reactors. It appeared, however, that the program could be started with the X-ray and would not have been as complete if we had required the tuberculin test. In this survey, by radiograph, we found only 34, or 0.2 per cent of the entire population, with significant pulmonary tuberculosis. These findings were the lowest for any substantial group in any of our surveys. They were even lower than approximately the same number of high school pupils whose average age was four years younger than the college students, and only one-fourth of the findings in approximately 9,000 enrollees in the N. Y. A. This discrepancy may be accounted for in large part by the differences in the economic level of the college student as compared to the high school and N. Y. A., and also on the basis of their racial background. In the colleges studied, it was estimated that 85 per cent were Jews, whereas, in the high school and N. Y. A. probably not more than 30 per cent were Jews. Experience in New York indicates that the Jew has a considerably lower death rate from tuberculosis than the non-Jew and the peak of their tuberculosis occurs later in life than among non-Jews.

I, therefore, believe it should be again emphasized that in any program designed to eradicate tuberculosis, case finding is fundamental, and that the amount of effort devoted to case finding should bear a definite relationship to the expected yield in significant cases of the populations studied.

I am indeed glad to see that the American Student Health Association is making the control of tuberculosis among college students one of its major activities, and such studies should be set up on a periodic basis, probably tuberculin testing negative reactors from the previous year and X-raying positives until we have had sufficient information to indicate at what age or what year of college one may expect to find the most significant pulmonary tuberculosis.

Book Reviews

Psychobiology and Psychiatry, by Wendell Muncie, M.D., associate professor of psychiatry, Johns Hopkins University; assistant psychiatrist, Henry Phipps Psychiatric Clinic, Johns Hopkins Hospital; 739 pages with index, illustrated. St. Louis: C. V. Mosby Co., 1939. Price $8.00.

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Psychobiology is the study of normal human behavior. It accepts no sharp and fast distinction but attempts to integrate the whole life of an individual. Psychobiological functions deal with a number of items: (1) native assets in (a) instinctual drives or performances, (b) the fundamental organismal rhythms of waking and sleeping and variations in fitness and efficiency, and (c) intellectual differentiations or endowments; (2) acquired skills; (3) basic mood and its variations; (4) habit; (5) memory; (6) ambitions and vision of opportunity and anticipation; (7) imagination and fancy; and (8) reasoning.

Psychobiology was first taught at Johns Hopkins University Medical School in 1913 by Adolph Meyer, now Henry Phipps Professor of Psychiatry and director of the department of psychiatry at Johns Hopkins. This book was written at his invitation by one of his students. It attempts to give a fair account of the conception, teaching and working methods of the Henry Phipps Psychiatric Clinic, which was also established at Johns Hopkins Hospital in 1913. The text is aimed primarily for the use of students, and hence has been stripped of much detail (including statistics) which might be confusing to the beginner in the field.

The first half of the book deals with normal human behavior and the details of a method which permits the student to make an autobiographical, psychobiological interpretation of his own personality. The second half of the book is devoted to a study of abnormal behavior and gives many case histories. The third part gives the general basis and procedure for treating various psychiatric ailments. It is emphasized that treatment is not to be considered an attack on an "impersonal disease entity" but the patient must be made to see the responsibility for his own troubles.

The volume concludes with an historical survey and the bibliography of the development of the concept underlying the reactions set (neurasthenia, hypochondriasis, anxiety states, manic depressive psychoses, schizophrenia, etc.). Well organized in its main parts, the book perhaps suffers from the use of an extremely specialized vocabulary.

The Clinical and Experimental Use of Sulfanilamide, Sulfapyridine and Allied Compounds, by Perrin H. Long, M.D., and Eleanor A. Bliss, Sc.D.; 289 pages plus bibliography and index, black cloth. New York: The Macmillan Company, 1939. Price $3.50.

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This is a very complete and helpful monograph on chemotherapy of bacterial diseases. The authors deal with sulfanilamide, sulfapyridine and allied compounds of the same as the name suggests in great detail. Not only do they record their own results but they also include practically all the literature on these compounds. They outline the diseases which are benefited by these drugs and describe dosage and procedure. Besides this they discuss the diseases in which sulfanilamide and sulfapyridine therapy have been failures. For this reason, if for no other, this book is recommended as a helpful consultant to every practising physician.

The
JOURNAL LANCET

Represents the MINNESOTA, NORTH DAKOTA *Medical Profession of* SOUTH DAKOTA and MONTANA

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American Student Health Ass'n
North Dakota State Medical Ass'n
South Dakota State Medical Ass'n
Montana State Medical Ass'n
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Great Northern Ry. Surgeons' Ass'n

W. A. Jones, M.D., 1859-1931

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PROGRESS

This issue of the Journal-Lancet is devoted to tuberculosis in an attempt to aid in the Early Diagnosis Campaign of the National Tuberculosis Association. In requesting papers, progress in the control of the disease was constantly kept in mind, in this and other countries.

A case of congenital tuberculosis is reported and the authors emphasize the rarity of this condition. This is a fortunate fact, since if the disease were frequently congenital it would be more difficult to control. In China, we learn from Dr. Lee's article, not only of the antiquity of the disease but also that it still takes more than a million lives annually. However, progress is denoted in the fine organizations that are being effected. A review of the work in Scandinavia, with particular reference to Denmark, reveals marked progress in the more detailed developments of tuberculosis. Only a few years ago, it was generally believed that the bovine type of tubercle bacillus almost never causes pulmonary tuberculosis in man and, yet, in this issue Hedvall reports sixty-five cases and points out how the bovine bacilli are transmitted from cattle to man, from man to man, and from man to cattle. He shows that the disease in man due to the bovine type is just as virulent as that caused by the human type of tubercle bacilli.

An ideal epidemiological study in a single family group in a rural community is presented by Dr. Benton. There probably is no more encouraging situation in this nation than that in the county described by Dr. Vadheim, where of all school children and their teachers only 5.2 per cent react to the tuberculin test. This is largely due to the persistent efforts of the physicians in this county and their sanatorium superintendent.

Ambulatory artificial pneumothorax is one of the most progressive procedures in tuberculosis control, in properly selected cases, as presented by Dr. J. Rodriguez Pastor, of Puerto Rico, who has 2,000 patients under treatment by this method.

An ideal tuberculosis control program in a university is presented by Dr. Lees, who has taken advantage of new methods and in two days' time had X-ray films made

of the chests of 2300 students and by the end of the first six weeks of the school year had found twenty-two cases of pulmonary tuberculosis, most of whom had no symptoms or abnormal physical signs. The rapid method of making X-ray films, which he describes, is replacing the slow and expensive method of the past. There is nothing in the entire field of tuberculosis that denotes greater progress and offers so much hope for the control of this disease as the rapid method of making X-ray examinations of the chest.

In the state of Washington an intensive tuberculosis case-finding program has been under way for many years and the report of Cox and Thornton in this issue is only a small fraction of the splendid work that has been done in that state. Fluorography as it is being developed by Dr. G. Ruiz Cestero of Puerto Rico is deserving of further study and experimentation.

From Canada we find Ferguson calling attention to the seriousness of tuberculosis in hospital personnel, particularly students of nursing, and discussing a possible solution through immunization. Although vaccination against tuberculosis has not been found a satisfactory method of controlling tuberculosis among cattle in Canada and the United States, Dr. Ferguson's investigations are deserving of careful consideration. From the same nation, Dr. Dobbie also calls attention to the alarming incidence of tuberculosis in hospital personnel, particularly nurses, and offers a solution through contagious disease technic, such as is employed in the management of other contagious diseases, like diphtheria.

The ninth annual report of the Tuberculosis Committee of the American Student Health Association shows a definite increase in the number of colleges and universities that are endeavoring to create an environment on their campuses free from contagious tuberculosis. There is no one in the nation who is doing more progressive tuberculosis work than Dr. Lyght, the chairman of this Committee, not only from the standpoint of promoting actual work in our colleges and universities but also in the education of the public everywhere with respect to the modern methods of tuberculosis control.

Thus, we present an array of articles from various nations by authors who speak and write authoritatively in their respective fields.

J. A. M.

ERYTHEMA NODOSUM

There is continued interest on the part of the medical profession in the etiology and significance of erythema nodosum. At the present time, most authorities are of the opinion that this skin lesion is due to a variety of toxic and infectious agents, but there are a few who believe that it is distinctly a clinical entity—a disease *sui generis*.

A convincing mass of clinical data has shown that erythema nodosum may be one of the first manifestations of a tuberculous infection. This is particularly true in children. Scandinavian physicians have stressed the importance of this association for years. There have been many reported epidemics of erythema nodosum occurring in children where it has been proven that there had been a recent exposure to an open case of tuberculosis. Any individual having this type of inflammatory skin reaction should be examined carefully for other evidence of tuberculosis. The reaction to the intradermal injection of tuberculin is positive at the time of the eruption. In fact, the injection of tuberculin may be followed by the appearance of new nodules and a rise in temperature. A roentgenogram of the lung fields may or may not reveal a parenchymatous or hilar lesion. Tubercle bacilli may or may not be demonstrated in the sputum or gastric washings. In some instances, cervical adenopathy may be present. Every patient with erythema nodosum should be re-examined at frequent intervals over a period of many months.

It is also recognized that erythema nodosum, not infrequently, may be a part of the syndrome of acute rheumatic fever. In some patients, rheumatic fever may present an atypical clinical picture, and the appearance of erythema nodosum may be confusing. Only a careful period of observation will clarify the clinical condition.

Erythema nodosum has been observed during the course of many infectious diseases such as chronic meningococcal and gonococcal septicemia, syphilis, and lymphogranuloma venereum. Lesions indistinguishable from erythema nodosum have been described as a result of the ingestion of bromides and iodides.

An interesting clinical syndrome due to a fungus, *coccidioides*, has attracted attention in recent years. It is known as "Valley Fever," because most of the cases originate in the San Joaquin Valley in California. The patients have the initial symptoms of a respiratory infection, and then two to three weeks later, lesions characteristic of erythema nodosum appear on the extremities.

It should be pointed out that many individuals develop erythema nodosum and recover without any known cause being demonstrated. Patients may also have recurrent attacks.

Little is known concerning the pathogenesis of this skin lesion. It is believed that in tuberculosis it represents a tissue hypersensitivity to the products of the tubercle bacillus. While organisms have been isolated from the lesions in a few instances, it is not generally accepted that the reaction is due to the invasion of the cutaneous tissue by viable agents. An explanation for the mechanism whereby erythema nodosum is produced is still forthcoming.

Wesley W. Spink.

PHYSICIANS' REFERENDUM

Sometimes a privately owned medical publication performs a service that an association journal cannot do. We have in mind a poll of the medical profession recently conducted by *Modern Medicine* on the subject of socialized and federally controlled medical practice. Ballot cards were attached to the January issue of *Modern Medicine*, and the results of the referendum were published in March.

Inasmuch as *Modern Medicine* has a circulation of over 125,000, reaching all physicians in active practice in the United States, it is unnecessary to give any de-

tailed report of the results of that referendum here. We refer our readers to the March issue of that publication.

The *Journal of the American Medical Association* publishes the associations platform weekly, and if a questionnaire had been sponsored by it, loyalty on the part of members might have been responsible for a certain element of conformity to the dictates of their representative spokesmen.

The important thing about the poll is that it was not conducted by organized medicine. There was no element of coercion. It was a simple, fact-finding service conducted in the absence of oratory or association influence, and physicians have shown by their votes that they are overwhelmingly in favor of the A. M. A. program.

A. E. H.

BOOK REVIEWS

(Continued from page 187)

Surgery of the Eye, by MEYER WIENER, M.D., professor of clinical ophthalmology, Washington University School of Medicine, St. Louis, and BENNETT Y. ALVIS, M.D., assistant professor of clinical ophthalmology, Washington University School of Medicine, St. Louis; 445 pages with 396 illustrations. Philadelphia & London: W. B. Saunders Company, 1939. Price $8.50.

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This book fills a definite need for modern, up-to-date surgery of the eye. The illustrations are clear-cut and the text precise and practical. The authors give the results of their extensive experience and cover the field in a complete manner. All ophthalmologists who do any eye surgery, would do well to own this book.

Diseases of the Skin, by RICHARD L. SUTTON, M.D., Sc.D., LL.D., F.R.S., and RICHARD L. SUTTON, A.M., M.D., L.R.C.P.; 10th edition, 1513 pages plus index, red cloth, 21 color plates. St. Louis: C. V. Mosby, 1939. Price $15.00.

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The authors have again presented the classical work for which they are famous. They have reclassified the general text into 14 classes of subjects each dealt with in individual chapters. In addition to a particular chapter on treatment, they give detailed directions as to the mode of treatment of each particular class of disease which they discuss.

The photographic illustrations are quite numerous and, in fact, are sufficient to classify this book as an atlas plus a practical system of dermatology. This book has also been the reviewer's choice recommended to students and general practitioners because of its thorough covering of the field of dermatology from a diagnostic, pathologic and therapeutic standpoint. Bibliographic entries are the most complete of any such work out of press. This book justifies any additional cost above that of another book, and no medical student or physician should be without it

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Occupational Diseases of the Skin, by LOUIS SCHWARTZ, M.D., and LOUIS TULIPAN, M.D.; 755 pages plus index, 116 photographs; green cloth. Philadelphia: Lea & Febiger, 1939.

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This book deals with industrial skin diseases, their classification, causative agents, their differential diagnosis and a general outline of prevention and treatment. There are also chapters on the relation of occupational dermatoses to compensation laws and the problem of avoiding malingering.

The bibliography and subject matter are quite inclusive. The subject matter is divided according to occupation as well as to chemical irritant, facilitating the use of the book for reference and consultation.

Syphilis and Its Accomplices in Mischief: Society, the State and the Physician, by GEORGE M. KATSAINOS, M.D., gray paper, 676 pages, plus appendix. Athens, Greece: Kylos Publishing Co., 1939

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This is a thorough discussion of syphilis and its treatment, written in an essay style colored with the author's own experiences. This book is bound together with his book *Marriage and Syphilis*, a book of 162 pages. A book recommended to syphilologists and workers in the field of syphilis.

Tumors of the Skin, Benign and Malignant, by JOSEPH JORDAN ELLER, M.D.; 539 pages, plus bibliography and index, black cloth. Philadelphia: Lea & Febiger, 1939. Price $10.00.

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This book deals with all benign tumors of the skin, including those of infectious origin and those conditions of the skin that are considered to be precancerous. The malignant tumors of the skin are considered both from detailed therapeutic procedure, especially as regards their location. A chapter on lymphomas and leukemic tumors is brief and concise. In addition, the appendix contains practical data on radiation therapy and proper dosage to be employed. It is especially recommended for the physician who is not associated with a busy clinic and who would benefit no end by this volume.

An Introduction to Medical Mycology, by GEORGE M. LEWIS, M.D., and MARY E. HOPPER, M.S.; 307 pages plus bibliography and index, red cloth. Chicago: The Year Book Publishers, Inc., 1939.

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The authors have correlated the fields of mycology and dermatology and have produced a book which is practical and useful to all physicians who have anything to do with the skin and its appendages. A book recommended to laboratory technicians, general practitioners, gynecologists, and dermatologists.

Dr. Colwell's Daily Log for Physicians. Champaign, Ill.: Colwell Publishing Company. Price $6.00.

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The *Daily Log* for 1940 is, of course, similar to its preceding volumes. It is again a complete log with space for each visit and type of service rendered as well as for arrangements of charges and receipts. Following each month there is a well organized expense account sheet from which a physician may carry forward monthly totals, thus making a rendering of income tax returns not only a simple, but almost an enjoyable task. There is also space provided for social security tax, narcotics dispensed, personal and surgical and obstetrical records. Altogether it may be said that *Dr. Colwell's Log* furnishes a most complete record of the daily life of physicians, and because of the orderly way in which this record is kept, it becomes a permanent record which any physician should keep from year to year.

Diseases of the Ear, Nose, and Throat, by FRANCIS L. LEDERER, M.D., F.A.C.S.; 835 pages, 500 halftones and line drawings, 16 full page color plates. Philadelphia: F. A. Davis Co.

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This textbook on diseases of the ear, nose, and throat includes diseases of the tongue and mouth, and mentions some conditions of the neck as well. It is written by a man who has been teaching for many years and he has illustrated his book with beautiful cuts of clinical conditions as well as numerous photographs of original dissections, and many valuable tables. There is not an illustration of a surgical instrument in the book.

The material is presented in a clear-cut manner, all the newer advances in diagnosis and therapy are included. It is complete and should have a place in the library of every specialist in otolaryngology. It can be recommended without reservation to students and others interested in the subject.

Future Meetings

TENTATIVE PROGRAM SOUTH DAKOTA STATE MEDICAL ASSOCIATION MEETING

Monday, May 20, 1940

Morning

9:00 o'clock—Scientific cinema.

10:00 o'clock—Dr. R. K. Ghormley, Dept. of Orthopedics, Mayo Clinic, "Choice of Bone Graft Methods in Bone and Joint Surgery."

Dr. J. V. Sherwood, superintendent South Dakota State Sanatorium, "Collapse Therapy in Tuberculosis by Means of Artificial Pneumothorax."

Dr. Raymond Bieter, Department of Pharmacology, University of Minnesota, "Serum and Specific Chemotherapeutics of Pneumococcus Infections."

Afternoon

Dr. R. K. Ghormley, "Non-operative Fracture Treatment."

Dr. H. D. McEwen, Department of Chemistry, University of South Dakota, Vermillion, "Some Recent Advancements in Our Knowledge of Vitamins."

Dr. Bieter, "Newer Drug Theapy."

4:15—Golf tournament.

Tuesday, May 21, 1940

9:00—Scientific cinema.

10:00—Dr. Louis A. Brunsting, Section of Dermatology, Mayo Clinic, "Helps in Treatment of Common Diseases of the Skin."

Dr. Stoesser, Department of Pediatrics, University of Minnesota, "Preventive Allergy in Infancy and Childhood."

Dr. R. G. Allison, Department of Radiology, University of Minnesota, "X-ray Therapy."

12:30 to 2:30—Round-table discussions led by Brunsting—"Eczema", Allison—"X-ray Diagnosis", Stoesser—"Prevention and Treatment of Diseases in Childhood."

Dr. F. W. Haas, Yankton State Hospital, Yankton, South Dakota—"Insulin and Metrazol Treatment of Mental Diseases."

Dr. O'Brien, Department of Pathology and Preventive Medicine, University of Minnesota—A clinical subject.

4:15—Second meeting of the House of Delegates.

7:00—Banquet. Dr. O'Brien will be the principal speaker at the banquet.

Wednesday, May 22, 1940

Morning

9:00—Scientific cinema.

10:00—Dr. J. W. Duncan, Department of Surgery, Creighton University, Omaha, Nebraska—"Diagnosis and Treatment of Carcinoma of the Breast."

Dr. C. B. Wright, Department of Medicine, University of Minnesota—A medical subject.

Dr. Waugh, Section of Gynecology, Mayo Clinic—"Endometriosis".

Afternoon

Dr. Duncan—"Diagnosis and Treatment of Perforated Peptic Ulcer"; Dr. Wright, a medical subject, and Dr. Waugh, "Leukorrhea and Trichomoniasis."

Minnesota State Board of Medical Examiners

Julian F. DuBois, M.D., Secretary
230 Lowry Medical Arts Bldg.
St. Paul, Minnesota

DOCKET OF CASES

Willmar Physician Sentenced to Not to Exceed Four Year Term for Criminal Abortion

Re. State of Minnesota *vs.* Iver S. Benson

Iver S. Benson, 58 years of age, entered a plea of guilty on September 28, 1939, in the District Court at Willmar, Minnesota, to an information charging him with the crime of abortion and was sentenced by the Honorable G. E. Qvale, Judge of the District Court, to a term of not to exceed four years at hard labor in the State Reformatory at St. Cloud. Dr. Benson was arrested on August 17, 1939, at Willmar, where he maintained his office as a physician and surgeon, on a warrant charging Dr. Benson with manslaughter in the first degree, following the death on August 15, 1939, of a 32 year old married woman at Montevideo, Minnesota. At the time of his arrest Dr. Benson admitted that he had performed a criminal abortion upon this woman and that he had received the sum of $25.00 for his services, although he had asked for $50.00. The abortion was done in the office of Dr. Benson at Willmar, on Monday, August 7, 1939. Shortly thereafter the woman became critically ill and a Montevideo physician was called in, who immediately removed her to a hospital. Upon being arraigned in Municipal Court at Willmar, August 18, 1939, Dr. Benson demanded a preliminary hearing which was set for August 24th. Bail was fixed in the sum of $7500.00, which Dr. Benson furnished. On August 24th, Dr. Benson waived his preliminary hearing and was held to the District Court.

The investigation also disclosed that another Montevideo woman has been seriously ill since December 14, 1938. This woman stated in a sworn affidavit, that Dr. Benson had performed a criminal abortion upon her on that date. It has since been necessary to hospitalize this woman on two occasions in order that she might have surgical treatment for the injuries sustained by her at the time of the performance of the criminal abortion. This patient weighed 119 pounds at the time of the abortion and only 74 pounds in July 1939.

Dr. Benson has been served with a citation requiring him to show cause, on November 3, 1939, before the Minnesota State Board of Medical Examiners, why his license as a physician and surgeon should not be revoked. The records of the Minnesota State Board of Medical Examiners disclose that Dr. Benson was born in 1881, in Jackson, Minnesota, and that he graduated in medicine from the College of Physicians and Surgeons in Chicago, in 1906. He was licensed January 18, 1907, in Minnesota by reciprocity. For the past eight years he has practiced at Willmar and prior to that, for a number of years, he practiced at Montevideo.

The Minnesota State Board of Medical Examiners wishes to acknowledge the prompt and capable handling of this case by Mr. Roy A. Hendrickson, County Attorney of Kandiyohi County, Mr. Clarence A. Rolloff, County Attorney of Chippewa County, and Sheriff Paul E. Anderson of Willmar, Minnesota.

LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS ON FEBRUARY 9, 1940

JANUARY EXAMINATION

Name	School	Address
Anderson, Bruce Murat	Stanford U., M.D. 1938	Mayo Clinic, Rochester, Minn.
Arack, George	U. of Minn., M.B. 1939	1323 Payne Ave., St. Paul, Minn.
Ashburn, Frank Strother	U. of Texas, M.D. 1938	Mpls. General Hospital, Minneapolis, Minn.
Barker, John Dennis	U. of Minn., M.B. 1939	St. Mary's Hospital, Duluth, Minn.
Beer, John Joseph	U. of Minn., M.B. 1939	Ancker Hospital, St. Paul, Minn.
Bergh, Solveig Margaret	U. of Minn., M.B. 1938, M.D. 1939	University Hospital, Minneapolis, Minn.
Brown, Robert Clifford	U. of Mich., M.D. 1933	Gillette State Hospital, St. Paul, Minn.
Campbell, Joseph Robert	U. of Manitoba, M.D. 1937	Mayo Clinic, Rochester, Minn.
Carıker, Mildred	U. of Texas, M.D. 1936	Mayo Clinic, Rochester, Minn.
Dysterheft, Arnold H.	U. of Minn., M.B. 1937, M.D. 1938	Glencoe, Minn.
Eaves, George Bennett	U. of Minn., M.B. 1938, M.D. 1939	2920 Sunset Blvd., Minneapolis, Minn.
Evans, Gerald Taylor	McGill U., M.D. 1932	U. of Minn., Medical School, Minneapolis.
Ferguson, Franklin Faulkner	Yale U., M.D. 1936	Mayo Clinic, Rochester, Minn.
Foss, Edward L.	U. of Wis., M.D. 1934	Mayo Clinic, Rochester, Minn.
Foster, Mark Anthony	Harvard U., M.D. 1937	Mayo Clinic, Rochester, Minn.
Gjerde, William Peder	U. of Minn., M.B. 1939	N.P.B.A. Hospital, St. Paul, Minn.
Grahek, Jack Phillip	Marquette, M.D. 1939	207 E. Sheridan St., Ely, Minn.
Ivie, Joseph McKinney	Duke U., M.D. 1938	Mayo Clinic, Rochester, Minn.
Jones, Richard Herbert	U. of Minn., M.B. 1939	Ancker Hospital, St. Paul, Minn.
Kelsey, Mavis Parrott	U. of Texas, M.D. 1936	Mayo Clinic, Rochester, Minn.
Kent, Richard Nelson	Northwestern, M.B. 1936, M.D. 1937	Mayo Clinic, Rochester, Minn.
Kimball, Charles Dunlap	U. of Buffalo, M.D. 1934	Mayo Clinic, Rochester, Minn.
Knutson, Gerhard Elmer	U. of Minn., M.B. 1939	123 Summit Ave., Apt. 4, St. Paul, Minn.
La Due, John Samuel	Harvard U., M.D. 1936	Mpls. General Hospital, Minneapolis, Minn.
Lehnhoff, Henry John, Jr.	Northwestern, M.B. 1937, M.D. 1938	Mayo Clinic, Rochester, Minn.
Leverenz, Carleton Walter	U. of Ill., M.D. 1939	Ancker Hospital, St. Paul, Minn.
Lorber, Victor	U. of Ill., M.D. 1938	U. of Minn. Medical School, Mpls.
Lott, Frederick Hartmann	U. of Minn., M.B. 1939	1050 Burns Ave., St. Paul, Minn.
Love, William Robert	Kansas U., M.D. 1936	Mayo Clinic, Rochester, Minn.
Lynch, Robert Clyde, II	Tulane U., M.D. 1938	Mayo Clinic, Rochester, Minn.
MacCarty, Wm. Carpenter, Jr.	Johns Hopkins, M.D. 1937	Mayo Clinic, Rochester, Minn.
MacKay, Hunter John	Western Reserve, M.D. 1937	Mayo Clinic, Rochester, Minn.
Manson, Arnold Irvin	U. of Minn., M.B. 1938	Mpls. General Hospital, Minneapolis, Minn.
Megibow, Samuel J.	U. of Minn., M.B. 1939	603 Fuller Ave., St. Paul, Minn.
Miller, James Rex, Jr.	Northwestern, M.B. 1936, M.D. 1937	Mayo Clinic, Rochester, Minn.
Mitchell, Berton David	U. of Minn., M.B. 1939	Ancker Hospital, St. Paul, Minn.
Moen, Dale Veo	U. of Chicago, M.D. 1939	Ancker Hospital, St. Paul, Minn.
Muller, Albrecht Eugene	U. of Minn., M.B. 1939	1426 Palace St., St. Paul, Minn.
Neale, Roderick Malcolm	Stanford U., M.D. 1936	Mayo Clinic, Rochester, Minn.
Otten, Donald Earnest	Northwestern, M.B. 1938, M.D. 1939	University Hospital, Minneapolis, Minn.
Palen, Benjamin Joseph	U. of Minn., M. B. 1939	St. Mary's Hospital, Minneapolis, Minn.
Peters, Gustavus Alfred	Indiana U., M.D. 1938	Mayo Clinic, Rochester, Minn.
Proffitt, William Emory	U. of Minn., M.B. 1939	Northwestern Hospital, Minneapolis, Minn.
Reiley, Richard Edwin	U. of Iowa, M.D. 1938	U. of Minn., Medical School, Minneapolis.
Sayre, George Pomeroy	McGill U., M.D. 1938	Mayo Clinic, Rochester, Minn.
Scott, Frank Matthew	Indiana U., M.D. 1937	Mayo Clinic, Rochester, Minn.
Shick, Richard Montgomery	U. of Mich., M.D. 1935	Mayo Clinic, Rochester, Minn.
Strom, Gordon Wilnard	U. of Minn., M.B. 1937, M.D. 1938	Mayo Clinic, Rochester, Minn.
Teisberg, John Edwin	U. of Minn., M.B. 1939	Ancker Hospital, St. Paul, Minn.
Thompson, John Vernon	U. of Ill., M.D. 1939	Glen Lake San., Oak Terrace, Minn.
Throckmorton, Tom Dercum	Northwestern, M.B. 1937, M.D. 1938	Mayo Clinic, Rochester, Minn.
Van Demark, Robert Eugene	Northwestern, M.B. 1938, M.D. 1939	Mayo Clinic, Rochester, Minn.
Weisel, Wilson	Harvard U., M.D. 1938	Mayo Clinic, Rochester, Minn.
Wilder, Russell Morse	Harvard U., M.D. 1938	Mayo Clinic, Rochester, Minn.
Wolf, William Walter, Jr.	Hahnemann, Phila., M.D. 1939	Swedish Hospital, Minneapolis, Minn.

NATIONAL BOARD CREDENTIALS

Johnson, John Woodrow	U. of Minn., M.B. 1938, M.D. 1939	Kerkhoven, Minn.

News Items

Dr. Olafur W. Johnson, Rugby, North Dakota, and Dr. A. S. Rider, Flandreau, South Dakota, attended the meeting of the New Orleans Graduate Medical Assembly, February 26-29, and the sixteen day Post-Clinical Cruise which followed on March 2. Dr. Rider addressed the group on March 7. His subject was "Tuberculosis."

Dr. M. R. Snodgrass, formerly of Miles City, Montana, is now practicing in Anaconda.

Dr. L. H. Kermott of Minot, North Dakota, is the new president of the Northwest District Medical society.

Dr. D. S. Baughman, Madison, has been elected a member of the board of directors of the South Dakota Tuberculosis Association.

Dr. Harold S. Diehl, dean of the medical sciences in the University of Minnesota, represented the university at recent dedication exercises of the new $1,500,000 building of the New York Medical College of Flower and Fifth Avenue Hospitals, New York City.

Dr. B. A. Place, Great Falls, Montana, has been appointed to the staff of the state hospital at Warm Springs. He has given up his practice in Great Falls.

Dr. A. C. Fortney, Fargo, North Dakota, has joined the staff of the Fargo clinic as a specialist in internal medicine and neurology.

Dr. F. H. Malee of the Murray Hospital Clinic returned to Butte, Montana, in March after completing a two-month course at New York Post Graduate hospital in New York City.

Public health officials and workers from eastern South Dakota held an all-day meeting March 19 at Huron under the leadership of Florence Walker Englesby, Pierre, director of the state division of public health nursing. Public health nurses, county commissioners and representatives of the American Red Cross and the South Dakota Tuberculosis association attended

Dr. J. F. D. Cook, South Dakota state superintendent of health, announced that crippled children's clinics were conducted March 28 at Gregory and April 3 at Milbank.

Dr. A. A. Dodge was elected president of the Flathead County Medical society, Montana, recently. Other officers named were: Dr. T. B. Moore, Jr., vice-president; Dr. R. L. Towne, secretary; Dr. J. Arthur Lamb, treasurer.

Dr. D. M. Monserrate, chief of the surgical service at the United States veterans' facility at Fort Harrison, Montana, has resigned to enter private practice in Helena.

Dr. Vincent Ippolito, formerly of New York City, is now at Fort Yates, North Dakota, where he has begun his duties as medical officer. He has charge of the Kenel, Cannonball and Porcupine districts.

Dr. C. L. Scofield, Benson, Minnesota, celebrated the fiftieth anniversary of his coming to Benson on March 1, 1940. One of Minnesota's pioneer leaders in public health work, Dr. Scofield has been an active civic leader during his half century's residence in that community.

The annual George Chase Christian Lecture presented by the Cancer Institute of the University of Minnesota will be given on Tuesday evening, April 30, by Dr. John J. Bittner, National Cancer Institute Fellow, Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine. Dr. Bittner will speak on "Breast Cancer as Influenced by Nursing." Medical Sciences Amphitheater, 8:15 P. M.

Dr. J. A. Myers of Minneapolis addressed the Woodbury County Tuberculosis Association March 13 in Sioux City, Iowa; on March 19, he addressed the joint meeting of the Chicago Pediatric Society and the Chicago Tuberculosis Society on "The Relationship of First Infection to Clinical Tuberculosis;" and on March 28, on the occasion of the Iowa Tuberculosis Association's Silver Jubilee in Mason City, he presented four lectures on various phases of clinical tuberculosis.

The North Central Section of the American Student Health Association is acting as joint sponsor of the continuation course in health problems of college students at the Center for Continuation Study, University of Minnesota, Minneapolis, May 2 to 4, 1940. The University of Minnesota is inviting all institutions of higher education to send representatives to this course. It is believed that health directors, college nurses and college physicians will all profit by studying the possibilities of better student health care. The program will include a discussion of the following: Entrance health examinations, special medical advisory services, periodical health examinations, environmental sanitation, housing, control of contagious diseases, teaching hygiene, physical activities, and organization and development of services for the care of the sick. For further information write to the Center for Continuation Study, University of Minnesota, Minneapolis.

Necrology

Dr. D. J. McMahon, 70, of Breckenridge, North Dakota, died March 12,, 1940.

Dr. Andrew Resner, 74, of Ronan, Montana, died recently.

Dr. Fred Stangl, 48, St. Cloud, Minnesota, died March 19, 1940. He was a member of the Lewis-Stangl clinic.

Dr. Timothy J. Moynihan, 62, St. Paul, Minnesota, died March 8, 1940.

Dr. Lida Osborn, 65, Mankato, Minnesota, died March 11, 1940.

Dr. Thomas T. Warham, 74, Minneapolis, died March 27, 1940.

Dr. M. C. Sorensen, 71, Huron, South Dakota, died February 27, 1940.

Classified Advertisements

PHYSICIAN WANTED

Doctor wanted, age 25 to 40. Good Minnesota town of five hundred, has drug store and dentist, good high school. Diversified farming district, German and Norwegian community. This is a good location for man who wants to build up a paying practice: can make more than expenses from the start. Doctor retired, nothing to buy. Address Box 668, care of this office.

PHYSICIAN WANTED

Physician wanted to assist in general practice and surgery in Minneapolis. Good opportunity for gaining clinical experience. Complete X-ray and clinical laboratory. State school and hospital. Address Box 670, care of this office.

FOR SALE

South Dakota—General medical and surgical practice: town 1200 population, modern facilities; agricultural community: small hospital in connection with practice, can make good profit from the start, includes complete equipment; drugs, X-Ray; opportunity for surgeon. A bargain for cash sale or slightly more on terms. Reason for leaving, ill health. Address Box 671, care of this office.

EXCEPTIONAL OPPORTUNITY

for beginning or established physician to share suite of offices with another physician or dentist. Individual treatment room or laboratory, in new office building located in very best residential retail section. Address Box 653, care this office.

Advertiser's Announcements

NICKEL PECTINATE

The treatment of twenty hospitalized cases of diarrhea in children with raw, scraped apple was compared with other methods (Arch. Pediat. 57:43, January, 1940) and found to produce a definitely shortened period of recovery. The most probable mode of action is detoxification, a mechanism in which pectins play a part. In this connection it has been pointed out (Am. J. Digest. Dis. & Nutrition, 7:39, January, 1940) that the properties of pectin and the metal pectinates are not identical; in fact, certain observers have demonstrated that whereas pectin *per se* may actually promote bacterial growth, nickel pectinate in contrast manifests a bactericidal activity which beyond doubt is beneficial in the treatment of bacillary dysentery.

The literature dealing with the apple diet supports its use in such conditions as celiac disease, mucous colitis, typhoid fever, and practically all forms of enteritis. This suggests the use of pectinates in these disorders. "Nipectin" (Nickel-Pectin Compound, Lilly) is pectin combined with 0.15 per cent of nickel. Because of the presence of the metal, "Nipectin" is more soluble than plain pectin and its bactericidal properties are greatly enhanced.

WHAT EVERY WOMAN DOESN'T KNOW — HOW TO GIVE COD LIVER OIL

What Every Woman Doesn't Know is that psychology is more important than flavoring in persuading children to take cod liver oil. Some mothers fail to realize, so great is their own distaste for cod liver oil, that most babies will not only take the oil if properly given but will actually enjoy it. Proof of this is seen in orphanages and pediatric hospitals where cod liver oil is administered as a food in a matter of fact manner, with the result that refusals are rarely encountered.

The mother who wrinkles her nose and "makes a face" of disgust as she measures out cod liver oil is almost certain to set the pattern for similar behavior on the part of her baby.

Most babies can be taught to take the pure oil if, as Eliot points out, the mother looks on it with favor and no unpleasant associations are attached to it. If the mother herself takes some of the oil, the child is further encouraged.

The dose of cod liver oil may be followed by orange juice, but if administered at an early age, usually no vehicle is required. The oil should not be mixed with the milk or the cereal feeding unless allowance is made for the oil which clings to the bottle or the bowl.

On account of its higher potency in Vitamins A and D, Mead's Cod Liver Oil Fortified with Percomorph Liver Oil may be given in one-third the ordinary cod liver oil dosage, and is particularly desirable in cases of fat intolerance.

CAPSULES LIVER EXTRACT SQUIBB

A concentrated liver preparation for use in the treatment of pernicious anemia, so potent that nine capsules constitute the average daily maintenance dose (one U.S.P. oral unit), is supplied in Capsules Liver Extract Squibb now being marketed by E. R. Squibb & Sons, New York. Each capsule contains 0.5 gram (7½ grains) of liver extract suspended in a neutral oil base.

Since the patient with pernicious anemia must take liver (or stomach) extract in some form—either by injection or by mouth—throughout life, Capsules Liver Extract Squibb offer several advantages:

1. Convenient form of therapy—oral rather than injection.
2. Small dosage—generally three capsules, three times a day.
3. Tasteless—particularly useful for patients with an aversion to liver.
4. Supply factors of the Vitamin B Complex present in water-soluble extract of liver.

Capsules Liver Extract Squibb are standardized on the basis of the hematopoietic response in pernicious anemia as defined by the U.S.P. Anti-Anemia Preparations Advisory Board. They are supplied in bottles of 100 and 500.

PRIZE WINNING UPJOHN DISPLAY DRAMATIZES HEALTHFUL EFFECT OF PRODUCTS

A display of The Upjohn Company, featuring a full color painting of a boy measuring his height against the wall, with the dates written on the wall to indicate his rapid growth since previous measurements, won a major award in the All-America package competition.

The display is made up of three pieces, a large center piece with the painting and two small displays. Packages of Cod Liver Oil, Concentrates, etc., are spread about.

The colorful, human interest pictorial—with typical American boy, actual dates on wall beside height markings, and adoring

(Continued on third page following)

(Continued from third page preceding)
puppy—is made up as a separate framed subject that can be lifted from the display and hung on wall of office or recreation room as a permanent piece.

The original painting was done by Norman Rockwell, and The Upjohn Company designed the display.

Prize winners in the 1939 All-America package competition received awards at a presentation dinner at the Waldorf Astoria Hotel, New York City, on March 27th.

ZAVOD ANEROID PNEUMOTHORAX APPARATUS

T. B. men long have been clamoring for a simplified apparatus for pneumothorax. Many of the machines hitherto available were cumbersome, complicated and not easily transported from office to patient or to and from the hospital. Many depended on water suction or pressure to accomplish the desired result. They were not easily set up and the many structural limitations retarded their universal acceptance.

The Zavod Aneroid Pneumo Apparatus, recently developed, is easily carried from call to call. It consists essentially of a glass calibrated cylinder with a tightly fitted piston, activated by a hand operated cautery bulb. Measured amounts of air of as little as 5 cc. may be administered accurately.

The Zavod apparatus is distributed by Physicians and Hospitals Supply Co. of Minneapolis, Minn., who will be glad to show and demonstrate it to anyone who is interested.

NURSES' REGISTRY OFFERS SPECIALIZED SERVICE

Mrs. James A. McGregor introduces into nurses' registration a new element which is of interest. Registrants are classified according to their background and training so that the physician who desires to communicate with or refer his patient to a nurse whose work has been along the line indicated by the specific need may do so.

This has been a very helpful variation from the customary method of merely listing names and addresses and many graduate and undergraduate nurses of particular usefulness have been made available promptly to specialists at a considerable saving of time and effort to the latter.

The registry, in Minneapolis, is to be reached day or night, Colfax 1589.

The JOURNAL LANCET

Minneapolis, Minnesota
May, 1940

Vol. LX, No. 5
New Series

Some Aspects of a Mental Hygiene Program in Early Childhood*

William S. Langford, M.D.
New York, New York

THE family physician who sees his child patients from their earliest months, if not from birth, is in a peculiarly favorable position to include an adequate program for mental hygiene in his other interests in the progress and welfare of his patients. The parents come to him for advice regarding feeding regulations, immunization procedures, and various other aspects of physical growth and development. Frequently they also come to him for advice regarding the more psychological aspects of the child, particularly those relating to social and emotional growth and development. If he is to be able to give the requested advice on these matters in an adequate fashion, he is in need of some knowledge of these aspects of the growing process, the more frequent and important factors which interfere, and what, in the present state of our knowledge, seem to be the important underlying psychological needs of childhood.

Man is a social creature. A good mental hygiene program in childhood works toward a satisfactory adjustment of the individual to his environment including those about him. It also works toward an environment in which the individual may *reasonably* be expected to adjust satisfactorily. From birth there is an interrelationship of the child with the environment; the environmental influences may be either helpful or detrimental to the general state of mental hygiene of the child. The physician, who is the parent's natural adviser in matters pertaining to the child's health, is in a strategic position to guard against detrimental environmental influences, to watch over the early training of the child, and to instill sound attitudes in the parents.

During early infancy the child is largely dependent on those about him for the satisfaction of his needs. In the ensuing months there is a gradual development of various capacities which enable him to become less dependent, more self-reliant, and to participate more actively in his contacts with other persons. He becomes able to move about without being carried, to perform increasingly more difficult and skillful acts, to communicate with those about him through the use of words, and to have some sort of an understanding of the goings-on in his environment through the medium of the special senses and an elementary type of cerebration. This gradual unfolding of latent capacities goes on more or less independently of educational efforts; more important, the emergence of new capacities does not stop with the end of infancy although the new developments are less dramatic and may be less obvious than the first hesitant steps, or the first understandable words with which the child delights his parents. The pattern with which these new capacities emerge is common to all children, but the rate is peculiar to the individual child. It is important that the child be permitted to grow and develop at his own rate and not be pushed too hard or held back so that he will fit into some predetermined pattern. Most parents are more apt to do the former because of their

*From: The Babies Hospital, New York, and department of psychiatry, College of Physicians and Surgeons, Columbia University.

desire to keep up with the Jones's in matters of weight gain, earliness of walking, talking and the like. However, it is not at all infrequent to have children kept from feeding themselves because of the mother's desire for perfect performance from the start. On the more purely physical side, rigid adherence to popularized standards of weight gain or amounts of food to be ingested ignore the individual needs of the particular child. Aldrich[1] has well summarized the fundamental needs of an adequate mental hygiene program in infancy:

> In the early years of childhood physical and mental functions are so merged in the plan of growth that they cannot be considered separately. In fact, at this age mental growth is measured by physical accomplishment. Since this is so, there can be no mental hygiene as sharply distinguished from physical hygiene. Considerate physical care *is* good mental hygiene in infancy. To give a baby all the warmth, comfort and cuddling that he seems to need; to meet his wishes in the matter of satisfying and appropriate food; to adjust his habit-training to his individual rhythm; and to see that he has an opportunity to exercise each new accomplishment as it emerges; these are the beginnings of a forward-looking program in mental hygiene.
>
> Every human being, as he grows into childhood, must inevitably be hampered and opposed by the restrictions of his environment, and the best we can hope for is to modify somewhat the urgency of this conflict. The degree to which we are considerate of our baby's early needs, however, may be the measure of his later ability to feel secure in a world of change and to adapt himself to the necessities of circumstance.

The principles underlying good mental hygiene in infancy cannot be sharply separated from those necessary in the later age periods. Growth and development does not stop at the end of babyhood, either physically or psychologically. A good mental hygiene program must protect the child from pressures which interfere with those normal growth patterns which go on independent of the educational program. In the second year of life, educational or child training factors begin to operate. Utilizing the physical growth and development already attained, child training works toward *socialization* of the child. Socialization depends upon the establishment of a relative degree of self-dependence in the child and regulation of various physiological and emotional factors to conform to established social and cultural patterns as well as guidance in the less truly biological aspects of the child's relationships to others, matters of obedience, attitudes toward property rights and the like. This educational process begins to operate during the latter part of the infancy period and continues throughout the preschool period. It has as its purpose the preparation of the child for the give-and-take life in the larger social group of the school and later of the community and state.

Parents are perturbed and confused by the many rules and regulations laid down for continuing the educational or child training process. Conflicts of opinion are frequent. Parents, in particular mothers, come to the family physician for guidance. He must not lay down the law from the pulpit—a great many of the problems are purely biological, not moral or ethical. Even if there are ethical problems involved, the physician's job is to understand, interpret, and guide, not to judge and condemn. Scolding and blaming will not help the parents. A willing ear will soon get the preoccupations, worries, and misconceptions which are frequently important underlying factors in unsuitable child training. Influencing the environment of the child involves more than assuming that the difficulties are due only to ignorance on the part of those who care for the child. It involves an interest in understanding why the parent or parents are acting as they do. The family physician may frequently be in possession of this knowledge as a result of his contacts with the family members down through the years. He will appreciate the need for patient guidance, correction of misconceptions, reassurance for fears, help in dealing with their own personal frustrations and concerns which parents often need before they are able to utilize the new knowledge which has come their way.

In late infancy the child has become sufficiently physiologically mature so that he is able to take over certain activities which have previously been done for him and to take over some control of physiological functioning. He learns to feed himself, at first clumsily and later with some skill. Most children who are not hampered by a mother or nurse who wants perfection from the start, will begin to try to feed themselves by 18 months. The time to begin is when the child shows interest. The child who has not developed good feeding habits in the earlier months will not suddenly develop good habits at this age. The prevention of poor feeding habits begins at birth. It involves more than offering sufficient amounts of proper food. Mealtime is frequently the only time a child gets the needed mothering and cuddling from a busy mother. The manner of presenting the food is as important as the food itself. Many weaning difficulties can be avoided by letting the mother hold the child as she feeds him the bottle or later, when weaned to the cup, make up to the child for the seeming deprivation with some affectionate reassurance. Delayed weaning from breast and bottle is as often a factor in poor feeding habits as is too early weaning. The difficult mealtime situations arising out of reliance on preconceived standards rather than on the child's appetite for determining the amount of food to be taken are all too frequent. Hunger is the first physiological activity to be brought under control, the child being fed at predetermined intervals. This is necessary for good household management, but the feeding times need not be too accurately followed.

Sleep too is regularized at an early age. Again for the sake of efficient household economy (to say nothing of good relationships with neighbors) sleeping must be done at appropriate times. It is indeed fortunate that the young baby's rhythm of alternately sleeping and eating lends itself to regularization. Poor sleeping habits in healthy children come out of poor management.

Another physiological function which must be brought under voluntary control in the process of the development of self-dependency and socialization is that of ex-

[1]Aldrich, C. A., and Aldrich, M. M. Babies are Human Beings, New York, the Macmillan Company, 1938, p. x. By permission of the publishers.

cretion. Attempts at the development of bowel and bladder control are frequently begun long before the child is physiologically mature enough to develop control. Occasional chance success makes the parent blame the child for failure; these untoward pressures are often harmful to the child. Again, in this area, mothers like to keep up with the Jones's. In our experience, these Jones's are as prone to exaggerate as is the proverbial fisherman. Mothers are told by some that they can have a clean child by the end of the eighth week, and that bladder training can be established within the first year. Perhaps they can, but it is the mother who is trained and not the child. The best available evidence is that the earliest voluntary control of the sphincters begins at from ten to twelve months of age. Micturition is a more complicated neurophysiological act than defecation, and it is not surprising that voluntary control of this function is not completely established until three or four months later. The best time for toilet training, in the light of the participation of the child in the act, is then ten to twelve months for bowel, and fourteen months or so for bladder. Any efforts before that time are rather futile as the child is not mature enough. The optimal time, of course, varies in different children. Aldrich suggests that the best time is when the child is able rather firmly to balance himself on his feet. In the development of control the child needs encouragement and avoidance of perfectionistic attitudes and nagging; punishments do not have their place.

These are the earliest means by which the child is helped to gain a degree of self-dependence. The child can be hampered in his efforts in this direction through various parental attitudes. The most important of these are over-protectiveness and over-indulgence, a constant "worry" attitude over matters of the child's health, continual warnings that he may hurt himself as he begins to walk, climb, and play, and the type of handling usually referred to as "spoiling". These arise from a variety of underlying parental psychological needs. One parent may be "making up" for unhappiness in his own childhood. In another it may come out of self-blame for an illness in the child or the death of a previous one. The causes are almost as numerous as there are parents. On the other hand, inexperience, "scares", or confusions may be the important factors. When present they interfere with the normal progression of social development.

During the latter part of infancy and the next few years, the child is gradually acquiring certain patterns of emotional and social behavior which help in his socialization through making him more *sociable*. Emotional responses must become regulated and patterned. The child must learn the proper times and places. The very primitive response of anger in these next few years is brought under some degree of control. In the development of this, the child is in need of help. He does not simply outgrow it. Imitation of responses in other members of the family is a factor as is sympathetic reassurance which quiets the child's panic and helps him to meet the situation more constructively. This is a period of irritability in the child. He is frustrated not only by the pressures put on him from the outside, but the very nature of this period of growth is frustrating to him. He is developing asymetrically; he can do part of an act without being able to finish it. The child wants to say much more than his imperfect language development lets him. His imperfect motor coördination does not let him accomplish the skillful acts he contemplates. His environment is also frustrating to him. He is a child who wants to explore actively and poke his fingers, if not his nose, into everything. This is met with constant, and at times, unneeded restrictions on his activities. The child is apt to respond to these frustrations with anger, or, at times, he turns to the solace of sucking his fingers. He needs to be handled with an understanding of the period of life in which he is.

During the midst of their learning to control emotional outbursts, many children go through the so-called *period of negativism* referred to by many parents as the "No" stage because the child meets all demands on him with "No", or "I won't." This occurs at the end of the second and beginning of the third year, although it may be delayed, and is quite normal. It lasts several months. At this time the child acquires the meaning of negation, and applies it indiscriminately. It occurs during the above mentioned general period of irritability. Another factor would seem to be the resentment of the child at having to do things for himself. He resents the withdrawal of the mother from doing things for him. This is occasionally intensified by the birth of a younger sibling at this time. Successful handling depends on ignoring the more irrelevant "No's" and insisting on the more important matters of daily routine with gentle firmness and expectant confidence. The practice of "giving in" prolongs the period, and meeting the resistive behavior with a similar response breeds resentments and hostilities which may color the later life of the child. If the parent can be prepared beforehand for its appearance the reaction can be met with greater equanimity and handled more successfully. Feeding difficulties often begin at this time. The child loses his infantile chubbiness; frequently this is accompanied by a decrease in appetite due to decreased food requirements for growth. The parent, interpreting it all as a manifestation of negativism, resorts to unwise methods of trying to get the child to eat. These serve only to intensify the negativism. Adequate preparation for these changes may often prevent the development of a feeding problem.

Obedience, authority, and discipline are things which are disturbing to many parents. They are not sure which way they should go. They have heard that self-expression and freedom are goals in themselves but feel they have to put their foot down some place in order to keep themselves and their homes whole. These uncertainties make for inconsistencies in the demands made on the child which do not help him in developing control of his actions and appreciating the rights of other people or property rights. It seems to us that it is the inevitable lot of every child to experience many frustrations as he learns what he can and what he cannot do, and what things are permitted under what circumstances, and

gradually acquires a give and take attitude toward life. In this period the child is constantly breaking rules for which there are no biological reasons. The things he wants to do are often the things he must not do. He learns much from experiencing and experimenting. He needs benevolent guidance and a *reasonable* authority to conform to. Discipline should be depersonalized as far as possible. The child only too readily interprets denial or prohibition as a withdrawal of affection, especially if authority accompanies its demands with "If you love me, do this," or "I won't love you unless you do that." One of our patients said, "I know she loves me, but it feels like she doesn't if she won't let me do something ten or twelve times in one day." The young child is a realist; he thinks of love and affection in terms of their concrete attributes and not as more or less abstract concepts. He looks at things from the point of view of how they affect him and not how does he affect others. Discipline should be preoccupied with the desirability or undesirability of behavior rather than its inherent "goodness" or "badness". The child has a real need for a place to play where his activities are unhampered by constant restrictions designed to keep the household from being upset. Unbridled freedom, however, does not make a child happy. He looks for something stable to build on. He likes to know what he can or cannot do. Children like order, regularity and, as anyone who has told nursery stories to them knows, repetition of the same thing. In this important area our goals should be a reasonable response to a reasonable authority and an obedience that becomes coöperation rather than submission to a dictatorship.

Another important aspect of the mental hygiene of this period is the attitude towards the sex curiosity and tentative explorations which are normally quite prevalent by the fourth year. Most children will ask questions if given the opportunity. They should be met with frankness and the information desired given. The temptation is to give too much. It is to be remembered that to the child sex is not mere anatomical and physiological detail. He wants to know how it affects him in his everyday living. Most children learn that there are pleasurable sensations associated with the handling of the genitals. This occurs first during infantile explorations of various parts of the body. In later childhood a transitory period is almost universal and is not to be viewed with alarm. If the parents can be prepared in advance for such activities much can be done to avoid unwise handling in terms of punishments, threats, and instillation of unhealthy attitudes towards sex in the child. This is again primarily a biological problem at this age and not a moral or ethical one.

One cannot close a discussion of the mental hygiene needs of this age period without mentioning briefly the need for adequate and constructive handling of the various periods of illness. An attitude of protecting against all possible illnesses tends to infantilize the child and prevent successful growing up. On the other hand, the child, all too often, will give up the benefits, in terms of attention and fussing gained from illness, quite reluctantly. Constructive handling of convalescence is important; avoid too long prolongation of sick bed practices beyond the time when they are necessary. Discussions of diagnostic or prognostic possibilities is dangerous when done in the presence of the child or in hushed tones just out of earshot. The child guesses at what he cannot understand. Operative procedures should not be sprung on the child nor should he be informed of them too long ahead of time. Anesthetics should be carefully induced in order to prevent the development of fears and anxieties.

A good mental hygiene for the early years of childhood appreciates those factors in the child which are functions of growth and development. It realizes that for best adjustment, new loads must not be placed on the child before he is ready for them. It points towards socialization through developing in the child self-dependence and self-reliance. It imposes on the child a reasonable type of authority to which to conform; it helps him to develop control and to pattern important physiological and emotional activities; it gives him a concept of what he can and cannot do in different situations. In these various manners the adequate mental hygiene program prepares the child for the school period, with its increasing social horizons, responsibilities and needs for harmonious social relationships. The one most important factor which must be taken into consideration in all of the areas in which the mental hygiene program functions and which is placed here for emphasis rather than in the body of the discussion, is the basic need of the child to be wanted, to be loved, and to belong regardless of success or failure in what is required of him. It is through this affectional security that he is able to accept the inevitable frustrations which accompany the "child training" process without developing untoward and lasting resentments and hostilities.

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Etiology and Management of Speech Disorders

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MANY children pass through a period of irregular or defective speech during early childhood. The majority of children, however, inherit both a stable central speech organization and a well formed peripheral speech mechanism which guarantee a clear, distinct and uninterrupted articulation. Obviously, any child runs the risk of having his good speech impaired by accident and disease. These factors are more likely to affect an already inherently weak speech mechanism than a strong, stable speech set-up.

The prevalent belief that a child is expected to go through a period of poor speech during a certain period of development has misled parents and physicians into a policy of hoping and waiting for the termination of this disturbing period of poor speech. If a child has not established an intelligible speech pattern by the age of four, it is time to consider the matter seriously and to have a thorough examination of the child in some reputable speech clinic. For example, many adult stutterers encountered in college state that the reason no treatment has been afforded them is that all through the years their parents have lived in the hope that the stutter would be outgrown. It is true that many of the milder types of speech disorders tend to subside during the elementary school life of a child. When this occurs, it is ascribed to the fact that through a maturation, or growth process, the brain has been able to establish a well defined speech pattern. But to hope that the more severe types, such as confirmed stuttering and articulation defects, will take this course is absurd, for the percentage of stutterers and severe dyslalias among adults is about the same as the percentage in the lower grades of our school systems.

The White House conference of a few years ago reported that more than a million school children between the ages of 5 and 18 are so defective in speech that they require remedial treatment and training. Only about 60,000 of these are now receiving the necessary corrective training and treatment. Most speech surveys indicate that a little more than 10 per cent of the population has some type of speech defect; and of this number, there are about 1,800,000 stutterers, three times as many as the blind and deaf combined. I point this out because parents usually consider their children unusual in that they suffer from a speech disorder. In clinical work it is not an uncommon experience to examine a stutterer who really believes he is the only person in the world so afflicted. This thought has a tremendous influence in determining the attitudes these speech defectives have developed around their disorder.

The more common types of speech disorders may be listed as follows: lisping, sound substitution, oral inaccuracy, hoarse voice and stuttering. The more uncommon types are cleft palate speech, congenital short palate speech, aphasia, too high or too low pitch, monotone and dialectal speech.

The causes of speech disorders can be classed as hereditary, congenital and developmental. Many of the most severe types of articulatory problems are due to an inherent lack of growth of the central nervous system. Other articulatory speech disorders may be due to various physical anomalies of the speech organs, such as a too large or too small tongue, prognathic jaw, tongue tie, cleft palate, irregular formation of dental structures, and harelip. Obstructions caused by hypertrophied tonsils and adenoids, nasal polyps, and nodules on the vocal folds may in some cases be responsible for deviation in the speech process. Obviously, these physical conditions must be attended to by the oral surgeon and otolaryngologist before the child's speech can be improved through training by a speech pathologist. After the necessary surgery has been performed, the muscles that have adjusted to the obstructions through the years must be retrained to adjust to the speech mechanism in its new form.

Another important cause of much of the retarded speech, inarticulate speech and stuttering is an interference by parents, nurses and teachers with the child's native sidedness pattern. By this I mean that the majority of children, by hereditary stock, are predisposed to the development of speech on one side of the brain. It so happens that the hand, if allowed to act according to the neurologic dictates of natural inherent brain processes, will usually indicate the side of the brain on which speech is sponsored; that is, a strong, more active left half of the brain will be indicated by a right-handed choice, and vice versa for a stronger right half of the brain. In order that the speech pattern may grow and maintain its stability it is essential that it receive continuous stimulation from the corresponding hand through manipulation and use in the physical environment. The interference with this growth occurs mainly through the all too common practice of shifting the child's peripheral handedness. In some few instances the hand activities may be altered, say from left to right, with no resultant change of native sidedness in the brain. Whether a disturbance of stockbrainedness occurs depends on the stability of the inherited pattern, which is hard to determine in advance of the child's development.

It may also depend on whether the shift from side to side is partial or complete. In the majority of children who undergo some interference with their handedness there is a corresponding change taking place in the brain which results in a growth in strength and activity in the naturally nondominant side of the brain, causing a confusion or retardation of the processes responsible for reading, writing, spelling and speaking. These skills are

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dependent on strict one-sidedness for their fluent execution on the peripheral mechanism. It is an interesting fact that approximately 73 per cent of all stutterers have experienced this transfer, partial or complete, from left-handedness to right-handedness. Sometimes this interference is begun in the home and sometimes in the elementary grades at school. If a disability in speech, reading, writing or spelling is not one of the consequential effects of such tampering with native sidedness, one can often find other marks of a central character which are signs of a deep nervous derangement. Hyperactivity, fidgetiness, general nervousness, confusion in direction, slowness in silent reading, sluggish muscular movement and indecision often denote this central instability; and, from some evidence in the University of Minnesota Speech Clinic, some types of strabismus appear to be related to this phenomenon.

Not unlike many other prejudices, the aversion to left-handedness has been handed down through the ages from savage society. Born, I presume, of fear and ignorance, it still resides in the minds of many people. Left-handedness has too often been conceived as a sign of feeblemindedness. Among many people it is a common belief that left-handedness is an indication of sin and degeneration. Awkwardness has been a common rationalization of this prejudice by right-handed folk. These ideas concerning left-handedness have been so firmly imbedded into our social structure as a superstition that until recently almost all school systems required every left-handed child to become right-handed. A school system calling itself modern should adopt a policy against the shifting of children's handedness and a subsequent disturbance of their native sidedness. The left-handed child should be provided with scissors and desk suited for left-handed use.

There are other factors which enter into this picture of brain dominance. A disturbance of the natively dominant side of the brain, and subsequent speech disorders, can come as a result of high febrile diseases, accidents or traumas to the brain areas. In diabetic coma, the dominant speech area can be upset to cause stuttering. Thumb sucking of the dominant hand, representing the natively dominant sidedness pattern in the brain, can be incident to many speech disorders. In correcting the child's thumb sucking in the early months of babyhood, parents often inhibit the free use of the hand. In so doing there is a probability of an interference with the speech pattern. This would be true if the hand which is hampered is the outward sign of the side of the brain in which patterns for speech are maturating. Thus when a child, aged 12 months, is observed from the standpoint of right-handedness or left-handedness, because of an interference to inhibit thumb sucking, he may be using the hand that represents the side opposite to the actual growth processes for speech.

It may be far more important to give speech every possible chance for unimpeded development than to avoid some dental work which may or may not need to be done at the age of 8 or 9 as the result of thumb sucking. As a matter of fact, the most recent observations which have been made on this problem reveal the fact that thumb sucking itself loses its fascination for the child more quickly when no attention is given to it than when some stress is placed upon it. The process is analogous to the gradual elimination of temper tantrums when the child is left alone.

The question regarding the possibility of outgrowing stuttering is a moot one for many physicians. It is difficult to reply to this query, because many persons who say that they have outgrown their stutter have been able only to cover it up through the concoction of various hiding devices. Some of the most common devices are substituting words, beginning sentences with pet words or phrases, speaking either very slowly or very rapidly, and talking on residual air. The stutterer learns these so-called crutches from his social experience with stuttering and uses them for the purpose of hiding his speech defect. Then, too, the stuttering as revealed by spasms of the speech muscles may disappear, and the nervous system may still be pathologically deranged. This derangement may be evidenced by a spelling, reading or writing disability or, as indicated earlier in this article, the stutterer may lack orientation in direction, or may appear to possess hyperactive nervous reactions. I feel quite certain that most of those individuals who are confirmed stutterers in childhood do not even reach the outgrown stage in which they are able to hide their stuttering spasms successfully. The few who are able to do so are usually found to lack facility in certain other complex skills of the organism when they reach adulthood.

The child with defective speech who enters the playground for the first time is likely to be the center of disapproval in the form of mimicry, ridicule and teasing. The reason for this is that children do have a sense of humor and do see the comedy and queerness of the speech disorder. It is at this point in the child's contact with the outer world that his feelings are put to a test. If the child is sensitive to criticism he will either overreact to the group and become irritated at his playmates, or he will withdraw to a more comforting environment, usually the one provided by his parents. Either reaction, if continued, will result in the growth of a feeling of insecurity. The speech defect will be defined by the child as a handicap, a mark of inferiority, and he will struggle through the years with this attitude toward his defect. If he possesses sufficient drive to go on to college he is usually found to possess a much disturbed personality, replete with irrational thoughts and social morbidities. When this is true he needs psychologic help first of all, for it is most uncomfortable for a speech clinician in a university clinic to give aid to a patient with defective speech if, in addition to his speech disorder, he has a warped personality. In such cases the first problem is to get him adjusted to the fact that he possesses a speech defect. When this has been accomplished he is ready for the psychologic and neurologic work essential for speech rehabilitation.

In an issue of this journal sponsored by psychiatrists a long discussion of the mental and emotional hygiene

aspects of speech defectives would be unnecessary. The work in clinical speech is closely related to psychiatry. It is for this reason that at the University of Minnesota the children's speech clinic is a unit of the psychiatric clinic. Personality deviations are often the result of speech disorders. For those interested in managing speech defectives who do not have psychiatric help available I merely wish to stress the essential need for all experts attending to the patient who is handicapped by speech to help the patient look objectively and honestly upon his deviation. This he does when he learns to accept his difference, discuss it and define it as a way of talking. Defensive behavior leading to personality breakdown develops because the child has had no help in the direction of adequate emotional hygiene. Society places a high premium on speech, and it behooves the defective to adjust to his difference with a sense of humor. Wholesome attitudes are our saving graces in a world where hostility and competition are rampant. Admission of one's weaknesses is a device which creates favorable social relations while unverbalised defenses, ruses and psychologic masks result in uncomfortable tensions in social intercourse.

The usual method of handling a child who has defective sound formation is an attempt to aid the child in correct sound formation by showing him both tongue and lip positions. Not only is this method scientifically unsound but it tends to point out unwholesome speech differences in the child if it is continuously used. A speech sound is a unit made up of movements of all speech muscles functioning as a whole. We do not learn our mother tongue by first knowing the position of our speech organs in sound production but through the process of hearing sounds spoken by those about us. A child, then, who is defective in certain sounds possesses a debility either in the peripheral mechanism of the ear or in that part of the brain in which auditory speech patterns are recorded. Obviously, one is not attacking the source of the deficiency in speech by drilling the peripheral speech muscles. Rather, one should first be sure that the hearing mechanism of the child is intact and should then proceed to exaggerate the hearing act by stimulating the child with speech sounds. After the sound has been learned the child can practice it. Nonsense syllable drills for the tongue, lip and soft palate are helpful in limbering up the speech mechanism so it will more adequately serve the stimulus patterns emanating from the brain to the muscles.

In this brief discussion many other important aspects of speech defects are omitted. The orthodontist for example is aware of the relation of inadequate speech production to malocclusions, etc. Needless to say, the medical experts should attend to these conditions before the child is turned over to the speech pathologists for speech therapy. The speech pathologist must work with the physician. All physical conditions must be checked and treated before a child is ready to be managed by the speech clinician. Speech is a very delicate process dependent upon physical, neurologic, and physiologic harmony of coördination for its smooth and unimpeded function.

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Specific Reading Disability*

A Survey

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THE greatest block to the clear and early understanding of reading disability has been the inadequate and usually too general definition of the problem by psychologists, teachers, and laymen. There is little scientifically acceptable observation, deduction, and evaluation of therapy in this field. The tendency has been to group together the cases of many children who are less apt than their classmates in learning to read, and to treat the presenting symptom in a more or less standardized way. In the same way, cases of achlorhydria have in the past been treated as "lack of hydrochloric acid," instead of being understood, as they now are, in terms of the several syndromes which may include primary anemia, Monilia infestation, vitamin deficiency, et cetera. The educators, schooled in methodology, seem at times to be seeking a teaching technique to answer all of the reading problems in a heterogeneous school population. Others, familiar with psychiatric formulations, have tended to ascribe causal significance to the emotional problems which so frequently attend reading failure, and to assume that management of the former will take care of the latter. Thus, an interesting biological variation which might easily have been predicted by a geneticist who was familiar with the fractions of cortical function, as they may be measured, has been largely misunderstood.

Of course there are many reasons for delays in learning to read, or for difficult progress in reading. Obviously, the visual function may cause such difficulty, and it is imperative to have the eyesight established as sufficient for reading in all children before any judgment of reading ability may be made. In this connection, however, it may be of value to note that only a minority of children who have specific disabilities in reading—as distinct from all other tasks requiring visual discrimination—have enough eye difficulty to require treatment. In the experience of the author, extending over several hundreds of cases, treatment of the coexisting eye difficulties has not increased specific reading ability unless it was accompanied by other special measures. Moreover, certain careful studies in the last decade point to a surprisingly low correlation between reduced ability in reading tests—again, as distinct from other pursuits requiring a similar visual discrimination—and defects of vision.[1]

Just as ocular defects should be corrected, so also should the emotional problems which are apt to be present in any case. In our experience, a purely psychogenetic *specific* disability in reading has yet to be identified, although in a number of cases the reading situation is one which may be utilized by a child as an expression of denial of responsibility. In such cases it is usually not especially difficult to determine whether or not the capacity to learn to read is normal, regardless of the achievement. On the other hand, the child with a specific reading disability has a true inferiority, and this engenders in the majority of cases a personality reaction which is likely to be a problem. This must always be considered and managed along with the technical re-education in reading; if it is not, the latter may prove to be entirely ineffective.

Little need be said as to general intellectual ability in relation to reading. In children whose intelligence is below average, there will always be a problem in a regular school, and such a problem is frequently labeled by one of its prominent aspects: reading. Our present concern is with *specific* reading disability, the definition of which implies greater trouble with reading than with other comparable activities. In this condition, the presenting symptom may take the form of inability to acquire any reading; inability to retain words which have been learned; slow progress in learning to read; faulty reading mechanics; impaired reading comprehension; or abnormally slow speed of reading. Most of these difficulties, in greater or less degree, are present in all cases of the specific disability.

Children who are otherwise capable, but who seem to be relatively unable to learn to read with the ease of the average child, have come more often to the notice of all of us in recent years. In the last decade educators and psychologists have written hundreds of articles on the "non-reader." Most of these mention the type of child here described as having a specific reading disability, but only a few [2,3,4] have devoted to this type the extensive study that its numerical preponderance (in the large and mixed group of children who have some sort of reading trouble) should merit. It is interesting that the first note of the syndrome was made by a physician in 1896;[5] and a very scholarly monograph devoted to the subject was published in 1917, by Hinshelwood, an ophthalmologist.[6] However, it was not until the late nineteen-twenties that a needed emphasis was given to the problem, by the exact observations and clarifying deductions of Orton.[7] Orton found that the laggard function of reading was, in these cases, capable of development under appropriate ministration,[8] and considered the syndrome as a resultant of constitutional and environmental factors. He coined the descriptive term *strephosymbolia* ("twisted symbols") to replace "congenital word-blindness," the misleading heading which has persisted in the textbooks. Beyond Orton's studies, few medical papers dealing with this syndrome are in print, and in these few the authors have generally repeated Orton's observations and restated his deductions.[9]

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The presenting symptoms, when the reading disability is manifest, have been listed. When it is not manifest, the principal complaint may be poor spelling, sparse vocabulary, defects of syntax or grammar, or lack of ability to do accurate work in written form. Such complaints are commonly presented in the cases of pupils in the junior high school grades. In these cases there is most frequently a history of late or difficult acquisition of reading in the earlier grades.

In all cases, the language ability may be measured against such other abilities as that in mathematics, making allowance in the case of the latter for the immediate and remote effects of reading failure upon it. Also, an appropriate psychological examination, including performances dependent largely upon the concrete-mechanical (as opposed to verbal-abstract) intelligence, will give a basis upon which the extent of the language disability may be calculated. Self-administering tests of intelligence—of questionable value for any individual case—are for obvious reasons quite misleading in cases of specific language disability. On many occasions the author has seen a child with a reading disability labeled "dull", "borderline", or even "feeble-minded" on the basis of such unenlightened testing. Measurements of various fractions of the intelligence, of mathematics, and of reading and spelling may all be made by standardized tests,[10] and the academic situation, in terms of age or grade, thus defined. Children who consistently lag a year or more behind their classmates in reading skill are usually discovered to have a specific reading disability, when other obvious factors have been excluded. More important, from the point of view of outlining remedial work, are qualitative tests of the existing associations between the sounds and written symbols which are essential to the accurate reading and spelling of English. In the specific reading disability cases, these are always defective: if not absent, they are apt to be slow, uncertain, or frankly confused. Tests of these associations are not of much value unless they are carried out by experienced people. The interpretation of results in this instance is more important than the completion of certain prescribed procedures.

The diagnosis is made on the basis of the procedures mentioned above, and on these procedures only. While the child with specific reading disability most frequently has a set of characteristics which are important to the understanding of his neurological constitution, it is not these characteristics which define the efficiency or inefficiency of his language function. Orton first called attention to such features as mixed or left tendencies in handedness and eye preference patterns; to reversals; mirror-reading; mirror-writing; et cetera. One or all of these features may very likely be found in the child with a specific reading disability. In the author's opinion they, and the theory of cerebral dominance variations which Orton founded in part upon them, supply the most satisfactory explanation of the constitution with which we are here dealing. Unfortunately, these identifying features have been taken as absolute diagnostic signs by many who encounter them, or who fail to encounter them, in tests which may or may not be valid. Consequently much profitless controversy has attended the question of the cerebral dominance and its role in the development of language, while very little substantial study has been done.

Both Hinshelwood[6] and Orton[11] mention the familial factor which is so frequently noted. This factor may be summarized in the statement that specific reading disabilities, and other comparable language disabilities, tend to occur in certain family strains. Orton noted that there was also a tendency for the signs of mixed dominance—left and mixed handedness and eyedness—to run concurrently in these same families. One of the most striking features of specific reading disability is the sex distribution: almost all observers who have examined large groups agree that boys with this trouble exceed girls in the ratio of three or four to one.

Treatment may be managed in various ways, although the observance of certain fundamental principles in all cases is essential to success. These principles must be followed in order to establish an accurate and efficient association between the written or printed symbol and its counterpart in the spoken language. They are as follows:

1. Discard prejudices as to teaching techniques, such as sight reading, and return to the smallest units in which there may be confusion. This usually means that re-education begins at the level of elementary phonics.

2. Clarify the unit in the pupil's mind, distinguishing it from similar units with which it may be confused. It is usual to find confused visual-auditory language associations, confusion between the printed or written letters themselves, and, less prominently, confusion between spoken language elements (as reflected in auditory discrimination and in speech). If hearing itself is affected, it is a purely coincidental complication.

3. Re-enforce the confused, or precariously held visual symbol by associating it with the auditory and kinesthetic (both oral and written in the second instance) symbol. The auditory and kinesthetic perceptions of symbols are comparatively secure, and are of immediate aid in recognition of the printed symbol (as in reading) and its recall (as in spelling). It is interesting to note that modern methods of teaching reading have not emphasized the auditory and kinesthetic components of language. These neural roadways are older than the visual, so far as language is concerned; moreover, their part is indispensable to proper training in music, in dancing, in corrective speech, et cetera.

4. Many repetitions of the situations suggested above, in which the stimulus is quantitatively reduced, refined, and re-enforced are essential. This applies to an extent that would not be required by a pupil with average ability to learn reading.

The principles enumerated are not applied in any standard manner. Children with a specific reading disability who have reached a clinic will in practically all cases require an individual program of remedial work. Excellent general directions for this work in younger children have been worked out, especially by Gillingham and Stillman.[3]

The technical measures of re-education in these cases are simple, definite, and usually assured of success. They alone, however, are insufficient to meet the needs of the child who is not reading up to his grade. The whole course of studies must be adapted temporarily to the level of his ability. Later on, the direction of his education may have to be shifted, away from the more academic course, and toward the more practical one. Most important of all, the reassurance to the child that he will be able to go through school with improvement instead of failure must be given early and supported by a practical demonstration of his own increased skill. The child who has been frustrated in the competitive task of acquiring reading will quite naturally develop anxiety; and the anxiety, like anxiety otherwise engendered, will be met in any one of the several ways which the personality has at its disposal. This resultant, or at least concurrent personality problem needs foremost attention; but as a rule it is on its way to solution when the implements of success are given to the child, and the environment adjusted to provide him with more nearly normal conditions. A change in the curriculum is only the most obvious step to be taken in this environmental adjustment. The more difficult step is the education of those who come into contact with the child to where they can regard him without prejudice or anxiety. Seldom does this need to be done with reference to other children. Classmates, naturally, have but little if any stake in the academic progress of any given child, and consequently they will evaluate him on the basis of his social adjustment to them. The child with a specific reading disability is, more often than not, acceptable to his contemporaries. The problem in most cases is to deal with the guilt, which may or may not be manifest, in the minds of those at school and at home. If the teacher stops to reflect, he will realize that the methods in use, and his own skill, are sufficient for the requirements of the majority of the group; and that therefore the fundamental difference must be in the individual child who is not learning. If the parent stops to reflect, he will realize that, against this one failure, there may be cited a number of successes in various other fields—fields which require intelligence of an order quite as high as the order required for learning to read. If such reflection and reasoning may be brought to replace the rationalizations which both teachers and parents are likely to have developed, emotional tension is usually relieved and constructive coöperation obtained.

Many aspects of the child, such as his age when the problem is identified, the degree of his disability, his attitude toward it, and the quality of his intellectual endowment, have to be considered in setting up a way of treatment. Similarly, the resources of the parents, of the school system, and of the community are the environmental features which must also have influence on the management. With so many variables, it is clear that the child with a specific reading disability is best served by a separate and thorough study, and a plan suited to his own needs. It is the author's opinion that, at the present time, these requirements demand the services of psychiatrists, psychologists, and educators who have had some experience in this field, and who are able to coöperate with each other in rendering this needed service.

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Epilepsy Research and Mining*

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THE first two decades of my life were enlivened by the uncertainty and the excitement of gold mining. My father was one of the pioneer prospectors in the mining districts of Colorado and I early learned that smooth yellow buttons of gold could come from commonplace looking rocks and that many rods of back breaking drilling, blasting, and "mucking" might separate profitable pockets of ore. The last two decades of my life have been spent in neurological research. These two epochs of activity, though far apart in time and place, are closely similar in general methods and purpose.

The questions which face the would-be miner are three: First, are there valuable minerals in the area chosen. Second, can the ore be reached. Third, can it be brought to the consumers and disposed of profitably.

If we consider the area of neuropsychiatric disorders, we can say without hesitation that this is a rich field for investigation. The central nervous system is the master tissue of the body. None of the organs would function properly, either singly or as a coördinated whole, if the brain and nerves were gone. In man the central nervous system is important, not only for his existence, but for his continued productivity and his enjoyment of life. A person whose lungs or whose heart is crippled can still be an asset to society, but one whose mind does not function properly is not only useless and an object of pity, but may be a positive menace to others. In our present so-called civilization, the central nervous system is peculiarly tried. Today, approximately half of the hospital beds in the United States are occupied by persons with nervous and mental disorders. The potentialities of saving, in terms both of dollars and distress, are enormous.

In this article I shall speak only of the disorder which affects approximately one tenth of those with nervous or mental diseases, namely, epilepsy. If means can be found for ameliorating or preventing this condition, some half million persons in the United States who are subject to seizures will be directly affected, as well as the far greater numbers of those who have the predisposition to seizures.

The second question is whether new and significant facts can be uncovered. To this question only actual trial can give an answer, though the results of past efforts may give a clue. In medical investigation, as in mining, efforts and personnel are of two types. First, are the individual prospectors, persons endowed with ideas, and oftentimes with considerable luck, who have a keen eye for valuable facts which may lie in their paths or who are able to pan worthwhile knowledge from the mass of routine material which goes through their hands.

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Many prospectors who have "struck it rich" had no training in geology or mineralogy and many life-saving discoveries have come from a Koch or a Banting who had only ordinary training or equipment. The first big strike in the modern study of epilepsy was not made by a physician, but by an osteopathic practitioner in Michigan who demonstrated that seizures could be temporarily controlled by means of prolonged starvation. There will always be opportunity for keen, independent minded persons to add nuggets to the sum of medical knowledge.

However, surface outcroppings inevitably lead underground to such a depth that one man or a few men no longer can follow them. Deep mining requires the formation of a group of workers with specialized training, the purchase of expensive equipment, and both money and faith to carry the workers through inevitable periods of apparently profitless results. In deep mining there is always the element of gambling, for hidden values are necessarily uncertain values.

Research in epilepsy has been going on ever since the Renaissance, but because its effectiveness has paralleled the development of the basic sciences, achievement in the last two decades has been disproportionately great. I believe that as much progress in demonstrating the essential etiology of epilepsy has been made in the last 20 years as in the previous 2,000 years. To mention only a few of the many who have contributed, Geyelin of New York, Wilder, Peterman, Helmholtz of the Mayo Clinic, Talbot of Boston, and Bridge of Baltimore elucidated the chemical factors involved in the beneficial effect of a water or ketogenic diet. Fay of Philadelphia pointed out the clinical advantage of dehydration and McQuarrie of Minneapolis demonstrated and partially explained the phenomena of convulsions induced by pitressin and hydration. Penfield in Montreal boldly studied the cortical trigger zones of patients on the operating table. Keith, Spiegel and Aird made important contributions derived from laboratory studies of animals. Finally the demonstration that artificially induced convulsions seem to benefit patients with schizophrenia has stimulated neuro-physiologists and psychiatrists to labor over the physico-chemical processes involved in the convulsion discharge of the nervous system. Most of these discoveries have been made in cross cuts driven from shafts sunk in the special fields of pediatrics, or surgery, or internal medicine. Approaches to this problem by workers primarily interested in other problems is beneficial, yet there are certain advantages which accrue from a single minded effort which cannot be tempted away or discouraged from following the main vein of epilepsy.

In order to illustrate the time and the various approaches which may be required in the deep mining type of epilepsy research, I may sketch the work which Dr.

Stanley Cobb and I began in 1921 and which, with the help of various associates and the financial aid of the Harvard Epilepsy Commission and various individuals and foundations has been carried on for the past eighteen years in the Department of Neurology of Harvard Medical School. The accompanying diagram represents a mine, in which the levels are years and the various tunnels are the aspects of this research which have reached publication. It will be seen that the first contribution did not appear until three years after work was started. Although many of the studies, such as those of uric acid and of sugar metabolism, the chemistry of fasting and of ketosis, and of cerebral circulation, proved to be of only negative value so far as the etiology of epilepsy is concerned, they nevertheless added to the knowledge of human physiology.

A vein containing really high grade ore was not reached, however, until the 14th level (1935). Discovery of this vein followed the clinical application of Berger in Germany of the research of radio engineers. The exploration at Harvard of electroencephalography as applied to the study of epilepsy has been the work of Dr. and Mrs. Gibbs, neurophysicists, and of Albert Grass, electrical engineer. The electroencephalogram is a record of the electrical pulsations of the cortex of the brain. By means of this technique it is possible to distinguish epileptic seizures from those that are of a hysterical character, to differentiate the three major types of seizures which patients have and, in at least 95 per cent of patients, to record abnormalities of the brain waves in periods between seizures. Furthermore, the records give some indication of the portion of the cortex which is principally concerned, and point to the position of a surface lesion, such as tumor or trauma. Also, since the electrical rhythm of the brain seems to be a fundamental constitutional characteristic, electroencephalography can be used in the detection of those who carry a predisposition to seizures or an allied disorder. This examination, therefore, opens up tremendous possibilities for the prevention of epilepsy and probably other disorders of the brain and of personality. Finally, tracings of the electrical waves of the brain of patients and simultaneous extraction of blood which is passing through the brain provides a means of studying the chemical factors involved in the discharge of abnormal waves.

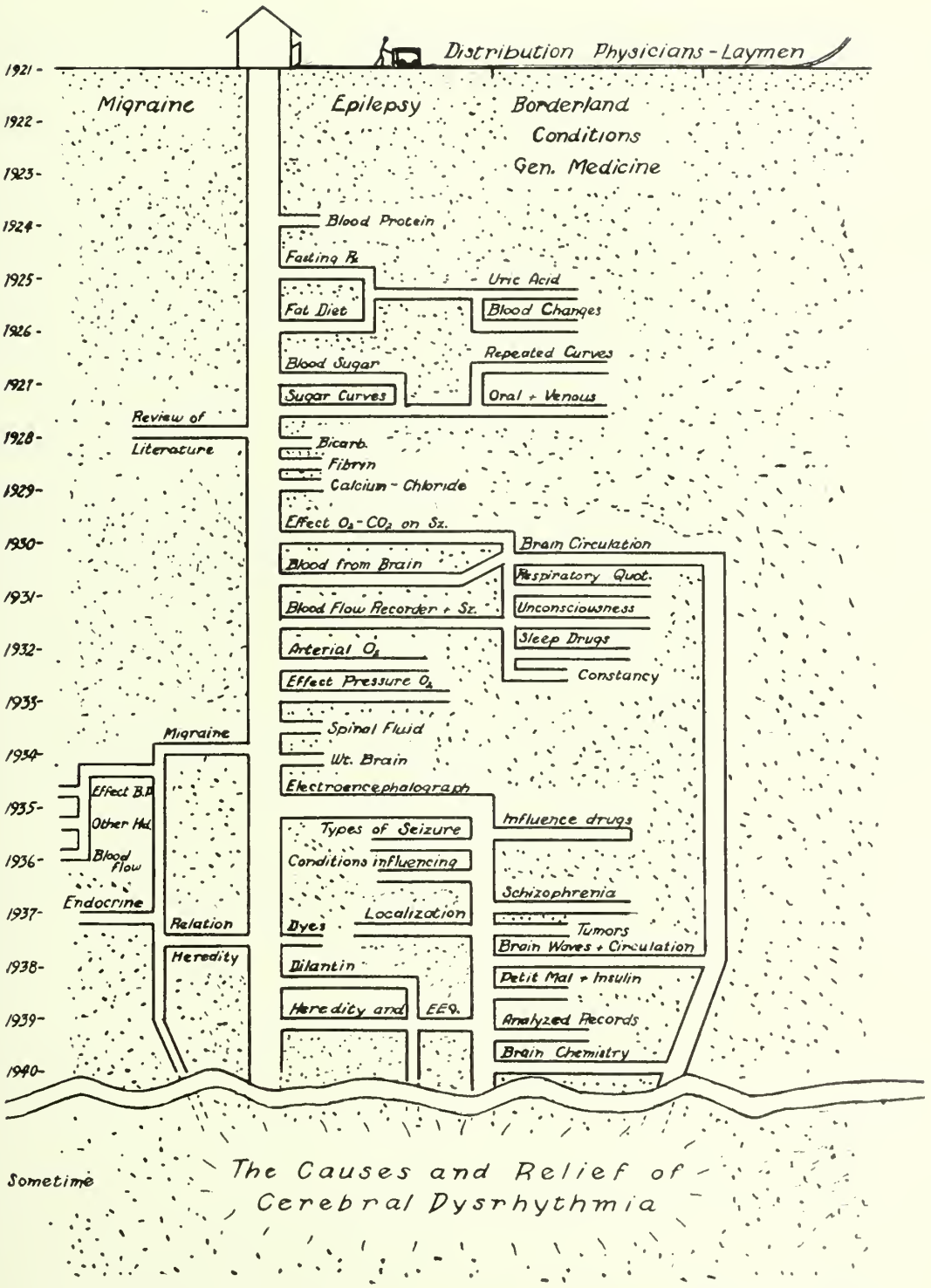
Another result of this research is the drug dilantin sodium. Doctors Putnam and Merritt undertook a systematic search for an anticonvulsant drug more effective than phenobarbital or bromides. After painstakingly testing the effect of scores of different drugs on convulsions electrically produced in animals, they found several which seemed to be more effective than either phenobarbital or bromide. When used on patients, one of these, sodium diphenyl hydantoinate (dilantin sodium) proved to have no serious toxic effects and in the majority of patients proved to be more effective in controlling seizures than other medication. Dilantin is of particular interest to the research worker, not only because certain types of seizure are more favorably affected than others, but also because it is not a hypnotic and therefore, unlike phenobarbital and bromides, its beneficient effect cannot be ascribed to its action as a general nervous system sedative.

The uncovering of a deep lying and extensive problem like epilepsy can never be accomplished by a single group of workers. The American branch of the International League against Epilepsy was formed for the purpose, in part, of coördinating and stimulating the work of American investigators. Among other places, special work is being carried on, or is planned, in New York, Boston, Montreal, Chicago, Minneapolis, and Baltimore. For a more adequate summary of what workers in various parts of the world are doing, the reader is referred to the publication *Epilepsia*. Now that war is here, the burden of investigation rests more heavily on workers in the United States.

The analogy between medical research and mining breaks down at one important point. The mining company through the sale of its product secures the funds needed for further exploratory work. The research worker gives his product away to the doctors, and through them to the general public. In the United States there are probably five persons with epilepsy for every active general practitioner. A new drug, like dilantin, which will enable the doctor to improve his treatment of the majority of these patients increases the prestige and the revenue of the doctor, and enormously increases the well being and earning power of the patients, but neither the doctor nor his patients make any cash payments or royalties to the workers responsible for the discovery, to enable them to search for a drug which is still better.

From what source, then, are funds for further work to be derived. The expense of exploratory work, whether medical or mining, increases with depth. The gold filled pocket which represents the final goal of epilepsy research (the chemistry of the nerve cell which causes it to discharge abnormally) is very deep indeed. Because of the political and economic uncertainties which lie ahead, it seems doubtful if the old method of grubstaking by rich individuals or foundations will prove adequate. Shares in research operations will need to be bought by those who will benefit from them, persons subject to or predisposed to epilepsy (perhaps a total of 10 million persons in the United States) and also the general public.

This brings us to the third question which faces the research worker; namely, how is new knowledge to be transferred from the laboratory to the persons most in need of it. Advancing medical knowledge has intensified this problem because practitioners of medicine (the smeltor and refiner of the mining industry) are being overwhelmed with new and more complicated and expensive diagnostic techniques and methods of treatment. Specialism only complicates the problem, for epileptics clutter the offices of all sorts of specialists who may be even less qualified than the practitioner to apply the special diagnostic and therapeutic procedures which are useful in epilepsy. The electroencephalogram, for example, requires expensive equipment and considerable experience in its management and in the interpretation



The principal avenues of activity in an investigation of epilepsy undertaken in the Department of Diseases of the Nervous System of Harvard Medical School, 1921-1940

of records. As demanding of money and care as the X-ray, it can be used for only one group of patients. Every large city should have one, but not every hospital or neurologist.

Because epilepsy is widespread and distressing and is poorly understood and treated, physicians need to be taught a new attitude and a new technique of treatment. More than this, because the prejudices and the mis-

information about epilepsy are deep rooted in the minds of the general public, a process of general education is called for. With these facts in mind, some of the physicians most interested in helping epileptics have sponsored an organization known as the "Laymen's League against Epilepsy." The members pay either $1.00 or $5.00 a year. This money is devoted to the twin purposes of popular education and of research. As dividends on their shares, members receive information which will help them in their understanding of the problem. This information is dispensed in the form of copyrighted bulletins issued periodically. This bulletin makes it clear that treatment of the individual patient can be carried out only by his physician, but invites questions of a general nature. The sponsors believe that this organization will help to dispel some of the fear and superstition which surrounds this disorder and will turn patients from mail order drugs to their physicians, especially to those physicians who are ready to apply conscientious and constructive methods of treatment.

In the search for new knowledge and in its proper application to the heavy ills of epileptics, what benefits one benefits all. The Laymen's League (in spite of its name) is open to doctors as well as to patients and their friends. The League is national in its membership and its scope of interest. Local needs and opportunities will call for the establishment of local lay organizations (affiliated with the national one) which will support doctors and research workers in particular areas. Members of the medical profession who support the JOURNAL-LANCET and laymen of this area are fortunate because Minnesota has medical investigators who have the training, the equipment, the interest, and, above all, the ideas which are essential for producing worthwhile results. They lack only the financial and moral backing of the medical profession and the public, those who will be the chief beneficiaries of newly discovered information. Success to the Society for Research on Convulsive Disorders!

The task of arriving at the causes and the best possible means for the prevention and treatment of epilepsy and other neuropsychiatric disorders is discouragingly long and arduous. Furthermore, the world at the moment seems more intent on the destruction than on the preservation and improvement of human life. A Fool's Gold rush is on. These conditions make it more imperative that persons, lay and professional, who have preserved a sense of true values should join together in finding and spreading new knowledge about epilepsy.

Mental Hygiene as Related to Chronic Illness

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THERE ARE, it seems to me, several ways of approaching mental hygiene, just as there are probably many valid definitions of mental hygiene. The subject has been confused because too few writers have been willing to limit their audience. Like after-dinner speakers with microphones before them, they hope for a responsive, invisible audience. The result has annoyed many doctors who are being urged to shift their methods of practice by people who do not understand the particular responsibilities and limitations of practitioners.

For purposes of this discussion I think it is reasonable to discuss the mental and emotional problems that arise when a child is suffering from chronic or recurrent disease, and to try to define the part that physicians should take in resolving them.

Almost all pediatricians recognize that illness has a profound effect upon growth and development, but many of us do not formulate our ideas about recovery from disease in children very clearly. In the young adult, recovery is assumed when a previously satisfactory state of efficiency is regained. In older people all we ask for is that no acceleration of senility occurs. In the child, however, no prolonged disease can be considered as satisfactorily over until the physician is convinced that the capacity for orderly development is unimpaired and that ground lost has been regained. The mere restitution to the status before the illness, which satisfies us when we are considering adults, has a sinister sound if it is referred to as arrested development.

If we attempt to include consideration of recovery in terms of restitution to normal development in our thinking about prolonged illness, it is, of course, necessary to include in our diagnoses and prognoses certain psychological and social components. It is not, I think, necessary or possible, to change the training of doctors radically, nor is it reasonable to expect them to shift time schedules drastically. What is essential is to develop attitudes which render the physician sensitive to the emotional and intellectual effects of illness and lead him to cultivate acquaintance with available psychiatrists, psychologists and teachers so that a team can be organized when occasions arise.

For many years I have worked in a general children's hospital where all sorts of cases are being skillfully handled by physicians of all types. When difficulties arise we have a team ready to undertake the study of emotional and intellectual problems as they are recognized

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in children whose entrance to the hospital was forced by physical symptoms. Without trying to classify cases too sharply, I think a few broad groups of children can be identified.

First, we have the group where the physician is unable or unwilling to make a definite diagnosis. Perhaps the typical case is one where evidence of cardiac involvement is equivocal. Many years ago one of the best pediatricians in the country gave his students, including myself, the impression that any child who suffered from chorea or rheumatic fever and might have heart disease, would have his life prolonged if absolute rest in bed for many months was insisted upon. The terrifying term "potential heart disease" was created later and children under suspicion were ordered to lead the life of semi-invalids over an indefinite time. Only the more thoughtful physicians pondered over the responsibility of organizing family attitudes and directing occupational therapy. The children with actual heart disease needed restriction and adequate supervision was provided. The group under suspicion was left to bewildered parents and all sorts of difficulties arose. The fundamental attack on this problem should be referred back to the cardiologist. If he maintains an uncompromising position, the mental hygienist is helpless. However, it is, I think, quite clear that it is often wise to face a slight risk of increasing the danger to the heart rather than to accept too easily the demoralization which sometimes follows prolonged and more or less unregulated restriction of activity. Here, and in numerous other cases the controversy, if disagreement reaches that point, must be conducted in such a way as to maintain medical and parental authority and confidence.

There are certain diseases, of which diabetes is an example, where disciplined acceptance of medical routine makes the difference between life and death. Here the medical man who handles children is obliged to make his patients into experts in disease. The extraordinary skill and ingenuity by which acceptance of routine is obtained indicates the vital importance of marshalling medical facts so that the family and the patient are freed from insecurity and frustration. Every successful diabetic specialist learns to make his rigid and complicated routines intelligible even to children. On the whole, it is fair to point out that the sharply defined physiological difficulty and the extraordinarily accurate medical knowledge about therapy are the important factors. As far as I know, the emotional problems that arise here are amazingly few.

The high incidence of emotional and intellectual difficulties in children with disturbances of the brain as contrasted with the relative serenity of children affected by infantile paralysis is striking and in some degree is dependent upon the accuracy of medical appraisal. In infantile paralysis the situation is usually clear. A certain number of neuromuscular units are subtracted from a known total and the result is a physiological disability which can be measured by accurate and well understood methods. Furthermore, the diagnosis can be stated in terms which make it easy to arrive at a conception of the adequacy of the physiological residue. The single mathematical formula is subtraction. The units are comparable and parents and teachers can follow the reasoning.

On the other hand, cerebral damage is usually diffuse and involves all sorts of cells so that appraisal by subtraction is an entirely inadequate procedure. Motor, intellectual and emotional patterns may be simultaneously upset and the diagnosis is frequently hard to formulate in physiological and anatomical terms. When parents and teachers try desperately to organize a plan which utilizes assets they are likely to add to the confusion. Here again the physician's major contribution, or at least his first contribution, is to clear the ground by making an accurate and durable diagnosis and prognosis which will lead to a useful appraisal of assets. Since psychological appraisal is essential, it is folly to discuss the effects of cerebral damage without considering the possible contribution of the ablest available psychologist. Optimism as to motor capacity may lead to complete frustration if psychological capacity is not appraised wisely.

On the whole, it seems to me reasonably clear that medical training forces practitioners to consider deficits almost excessively. The naming of the disease is always in terms of deficit and in spite of all the efforts to make medicine into a profession which safeguards health, it is still true that recognition and management of disease is the major job of the practitioner. The real problem is to develop methods which make it easy to go from the medical appraisal of deficit into the educational appraisal of assets. It is not too difficult to conceive of methods of appraisal, in cases of chronic disability, which will allow the physician to state the amount of disability, the degree and nature of the interference with growth, and the assets which are capable of exploitation by teachers.

The next problem is to find out how the family and the school will deal with the situation. It can be taken for granted that the home and the school have not, as a rule, had any very clear part in producing the diseases which lead to chronic disability. Aside from occasional cases where heredity or gross neglect is involved, chronic physical disorders cannot profitably be studied by searching out etiological factors in the family set-up. On the other hand, it is of the highest importance to study the intellectual, social and emotional make-up of the home and the school to which a handicapped child, or one with prolonged disability, is to be returned. Everyone who has practiced medicine for any length of time, has seen families who rose to the situation magnificently and went on wisely and unselfishly under the strain of the disturbances caused by the entrance of a handicapped individual. But it is also possible to point out other families where resentment smouldered against the limitations upon the rest of the family.

Entirely aside from any other factors, the attitude of the parents is to be watched with interest. It is obviously the respectable thing to view the situation optimistically. Physicians almost always tend to use optimism as a thera-

peutic device. I am by no means sure that optimism is a very safe medical attitude unless it is controlled very carefully. There is a point at which it is essential to prepare a balance sheet which will stand up. During the course of acute disease, the reputable physician is attacking disease and trying to save life. He cannot be expected to use any hard-headed attitudes as to the remote future during this time and I cannot remember anyone who enjoyed the practice of medicine who did not admit that he refused to look too far ahead in the heat of battle.

When the battle is over, however, parents usually ask, rather half-heartedly, about the management of the child. Then is the time to settle down to formulating management with a series of headings in mind, such as: Is the residue worth working over? If a child's mind, for instance, is grossly defective, it is absurd to waste time in planning to educate him for competitive living. The emotional needs of the parents should have primary attention. I know of people who prefer to spend half their meagre income on an incompetent child and others who grudge the slightest drain on adequate resources. My own feeling is that the physician should state his case, make it perfectly clear that he is protecting the child by any proposed plan and then coöperate cheerfully in whatever plan the parents select. This is a particularly sound policy since there is no evidence that any other method works.

If the child seems to be suffering from a degenerative disease, the first duty of the physician is to be sure of the accuracy of his diagnosis. No psychiatric crime is as serious as missing the medical diagnosis. However, there are plenty of cases where the diagnosis is clear. The underlying dreads, which I find most often, concern syphilis and heredity. The first can be settled easily. The second is not simple. We know enough about amaurotic idiocy, for instance, to advise parents about further pregnancies. But I, for one, do not feel at all secure about advising intact siblings. My feeling is that most of these infantile familial diseases involve personal tragedy rather than serious social and economic disturbance. If an individual wishes to take the risk, I see no real objection.

A slightly more complicated situation arises when a disease of longer duration, such as pseudohypertrophic dystrophy, occurs. The disease is usually recognized after infancy and most doctors feel reasonably sure that further pregnancies are undesirable for the parents. This advice is widely followed so that large statistics are hard to gather. It is possible to accept the ordinary theory that dystrophy is a disease which afflicts males and is carried by females, without jumping to the conclusion that sisters of a dystrophic brother should not produce children. Here again, the problem is one of personal judgment. Unquestionably dystrophy is a rare disease in a second generation. Equally unquestionably the chances of intact children are not too good. My feeling is that any couple has the right to produce children if they themselves are emotionally durable. As a matter of fact, if they are not, they rarely ask medical advice.

In general, perhaps this is a proper place to expound a point of view about heredity and the physician's duty towards it. I fully believe that no one with epilepsy, feeblemindedness or serious and continued mental disease should marry and have children. It seems to me quite clear that such a person cannot handle the complications incident to parenthood and on this ground alone, it should be discouraged. As a matter of fact the pressing problems usually arise when parents of one defective or epileptic child are troubled about the possible marriage of children who seem to be normal. Here mistakes are made with such frequency that it is impertinent to lay down laws. My own feeling is that most parents are comforted rather than disturbed by discussion of the available reliable evidence. The classics, such as the abominable histories of the Jukes and the Kalliakaks are not sound guides. It is far better to go over cases which have been carefully studied. On the whole it is rarely necessary to resort to general statements because the accurate study of individual cases rarely leads to despair.

It is obvious that a paper of this sort merely suggests a point of view and that a summary represents a rather frustrated attempt to bring order out of admittedly loose thinking. The points I would like to emphasize are:

1. The existence of chronic, recurrent or disabling disease interrupts education. It sometimes interrupts orderly mental and physical growth and it adds problems which confuse family relationships.

2. The primary medical responsibility is to make an accurate and durable diagnosis and to outline the diagnosis in terms which mean something to the parents and teachers who have to isolate and deal with remaining assets.

3. The strains set up by the prolonged illness of a child may easily impair the emotional stability of a family. The physician should, of course, recognize emotional factors, but should make a clear distinction between their importance as a cause of the child's difficulties and their importance as confusing factors which may impair the success of therapy. It seems clear that certain fears, such as that of syphilis and of defective heredity are common enough to bear watching and that the question of threats to other children need discussion.

I believe that relatively few serious mistakes in the mental hygiene of chronic physical disease can be laid at the door of physicians who state correct medical facts in intelligible terms, attempt to evaluate the disturbances of growth and development due to illness and face the fact that social, educational and emotional problems may arise which need team-play between the wisest available advisors. If, finally, the physician recognizes that his training teaches him to deal with deficits, while the child's educators must deal with assets, he will understand the necessity of coöperative supervision.

The Psychiatric Clinic for Children of the University Hospital

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In a recent *Journal of the American Medical Association,* it was shown that there were in 1938 nearly 600,000 beds for nervous and mental disease in this country as compared to 425,000 beds in general hospitals. It is well established that in addition to these patients in special hospitals, there are as many more individuals in the community who labor under neurotic complaints that seriously interfere with efficiency. This staggering burden must be shouldered by society. In recent years the number of mentally ill who must be cared for at public expense has been steadily increasing.

For the past two decades there has been a gradual growth of anxiety as to what may be done to prevent this never-ending stream. The establishment of the psychopathic units has done much to detect the cases of mental deviation and through intensive therapy in the early phases rehabilitate these individuals so that they may resume useful lives. This phase of psychiatry is, however, remedial. The program of prevention is still in its infancy.

With prevention as its goal, the Psychiatric Clinic for Children was inaugurated at the University of Minnesota in October, 1938, to supplement the newly developed program of the Psychiatric Department with its new 50-bed psychopathic hospital and increased facilities for outpatient service, teaching and research.

The program has three major aims:

1. *To integrate more closely psychiatric principles into the management of physically ill children.* The fact is becoming accepted that the emotions play a much more significant role in physical illness than has been generally admitted or considered. If medical teachers can accustom students to automatically consider these factors in the routine work-up of each case encountered, many of the conditions that now become apparent in aggravated form, and which investigation reveals have existed for years, may be corrected before they become destructive. No longer can the entire emphasis be placed on a purely somatic level and a satisfactory quality of medical procedure be maintained. The chief criticism directed against the advance of scientific investigation in medicine has been the tendency to forget the individual, except as the host of some intriguing condition of scientific interest. For years one has encountered the lament of the passing of the old family physician of a generation ago. His great claim to the affections of the public was that he really got to know his patients as individuals, and to take the personal peculiarities unconsciously into consideration in the treatment plan. Frequently his knowledge of late scientific development was woefully scant and yet his clinical results surprisingly good because of the entrance of the human element.

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Our hope is that through this very close integration of pediatrics and psychiatry a system of routine consideration of both sides of the clinical study will become automatic. It has been my experience over a period of several years in a medical school that many graduates who have become established in practice drop into the office to discuss problems encountered in their work and express the regret that we did not place more stress during their medical training upon the role emotional problems can play in illness. At that time, during the medical school years, it seemed to be of much less importance than surgical or medical techniques. As one young pediatrician commented: "There is no trouble looking after the kids when they are really sick—I know that side of it all down pat, but about half my calls are when there is really nothing wrong and the trouble lies with the mother or the grandmother and the kid takes the brunt of it—."

The mistake frequently made in teaching is to attempt to keep psychiatry as a separate entity than as an integration of a complete study. My hope is that through this new clinic we can creep up on the medical student when he least suspects it and painlessly lay the foundation for an appreciation of the emotional environmental angles. They who have been in practice have no difficulty in recognizing the problems well meaning relatives can create. Great is the satisfaction derived by anticipating their reactions in the management of the case. To understand motivation and mechanism in practical personal relationship often spells the difference between success and failure in medical practice. One medical man in whom I have greatest confidence from a diagnostic standpoint has the greatest difficulty in the management of his patients after the critical acute period because of his absolute lack of skill or interest in human reactions. It makes life unhappy for him and he constantly is fault-finding at the vagaries of human nature. He is completely blind to the fact that he himself is largely to blame.

Consequently I feel that the fundamental of psychiatry from a purely preventive anticipatory angle can be made of the greatest practical value in the teaching of pediatrics.

2. *To define more clearly boundaries in the field of psychiatry.* In medicine, surgery, and the other clinical services there are tangible entities that make delineation and clear-cut diagnosis possible. Clinical observations can be generally substantiated by laboratory examinations that corroborate the findings, and the pathologist can produce from the tissues specific changes that are consistent.

Relatively little is known at present as to the real nature of mental deviation. We must be content with the

description of constellations of reaction patterns that demonstrate the individual's capacity to adjust to life situations as they are encountered. Through the ages the gross deviations have been recognized and provision made to care for the group.

It is only in comparatively recent years that there has been genuine interest in the welfare of the individual mental patient; as the primary factor was the safeguarding of the public by the removal of the lunatic as a menace. The result was segregation, the offering of asylum for custodial care, and little thought of treatment. The responsibility became a governmental one, which too often had a connotation of neglect and disinterest.

The intensive educational program of the mental hygienist has accomplished one thing—if nothing else. Criticism has been generously directed toward the activity because of its tendency toward propaganda that has been without the backing of factual results to warrant its claims. Admittedly this has been true, but it has definitely reduced the prevalent fears and brought the incipient case of mental disturbance under observation at an earlier period while there is still hope of successful treatment. It is no longer regarded as disgraceful to admit some mental quirks. In fact, a well-defined neurosis frequently becomes a social asset.

Much of the fear and antagonism toward mental conflict has been removed. We accept deviation with a more casual, constructive attitude, but still do not know the real nature of the affliction. Is it a disease process or is it the result of years of ineffectual thinking, feeling and action that makes the patient a misfit in his particular milieu?

In a small proportion of the cases the true nature of the disturbance has been fully established as a degenerative process with demonstrable neurological change in the nervous system. General paresis is an excellent example of this, and now that the nature of the disease is known, and adequate treatment methods devised, there is promise that in a comparatively short time it will follow typhoid fever from among the prevalent scourges into the realm of medical rarities. Medically the field of psychiatry today has many analogies to the field of bacteriology a century ago before the role of specific organisms in disease was recognized.

The true nature of the majority of psychiatric problems still is a mystery. Our knowledge of metabolism, the role of the endocrines and the biochemistry of the body in its entirety still has many blank spots. The widely heralded improvements that are reported following the treatment of schizophrenia by insulin shock therapy and metrazol are food for thought as to the exact modus operandi of these agents from the biochemical viewpoint.

However, the school of psychiatric thought, which contends that the deviation is entirely due to environmental trauma, with an astigmatized psychological response to experiences, has a great deal of convincing data to back its opinions.

The Psychiatric Clinic for Children has an unequalled opportunity for research into these basic factors. With the full resource of an outstandingly fine and well-equipped pediatric staff and hospital under the direction of Dr. Irvine McQuarrie, who is recognized as a leader in biochemical research, and the staff he has built up, there is an opportunity to integrate the physical and psychological interrelationship that is unique. Research will constitute an important angle in our program, for it is through this channel the right of the clinic to survive can be demonstrated through a useful, worthwhile contribution to science.

3. *To offer the community a service facility*—and the Psychiatric Clinic for Children a source of study material.

While the community, the social agencies, and the medical profession in general have a detached interest in the research of the program, their chief interest is naturally one of self preservation and guidance in the management and understanding of the problems encountered in their work.

It is only through the generosity of the Board of the Stevens Avenue Home of Minneapolis and the Commonwealth Fund of New York that the establishment of this clinic became possible. Naturally the major interest of the former group is to provide adequate means of study and treatment for maladjusted children of this community.

While this generosity is magnificent, a word of warning must be offered in this direction. It would be easy to throw open the doors of the new clinic and welcome indiscriminately all comers who present behavior and personality difficulties. This would immediately defeat the entire purpose of the clinic. There would be no chance to do more than offer a purely palliative type of service, superficial, unsound and impulsive. Personally I do not want that type of clinic and I do not think this community would either. Refusal to accept all applicants and the exercising of discrimination in the selection of cases are bound to create some ill feeling. There is a small staff at present, the nucleus, I hope, of an organization to be developed in the future. To swamp this small force in the beginning with a deluge of failures that everyone has attempted to heal without result and now wants to unload on the clinic would be unfortunate.

The service needs of the community with our present staff cannot be adequately cared for. We are not going to try to meet the full need. Greater satisfaction will result to all concerned if careful selection is made of the type where the greatest good can be accomplished, when the results will be more lasting and the feeling of acceptance of the new unit built up soundly on the basis that we have something constructive to offer.

The three point approach seems to us to have the promise of a well rounded program of teaching, research, and community service, which, after all, are the fundamentals of all departments in a medical school.

Studies of Physical Defects in Delinquents

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THE theory that the delinquent and criminal form a recognizable human *type* was first put forward by the Italian criminologist, Lombroso.[1] According to Lombroso, physical examination and anthropometric study would suffice to separate the law-abiding population from the delinquent and criminal. This theory almost at once was challenged. In this country Ales Hrdlicka[2] in his study of destitute children and young offenders concludes that "the misbehaved children were not characterized *as a class* by any considerable physical inferiority, or by any great proportion of physical abnormalities; nor was it found that any particular atypical feature could be said to be characteristic of this class of individuals." Many other investigators have reached the same conclusion, namely, that the delinquent child conforms to no definite physical type. In England, Charles Goring[3] carried out a detailed anthropometric study on three thousand adult convicts and came to the conclusion that "there is no such thing as a criminal class differentiated by anomalies of physique." Although the evidence opposed to the *born* criminal theory seems to be conclusive yet in recent years the Harvard anthropologist, E. A. Hooten,[4] has returned to the subject and has amassed a prodigious amount of material in his efforts to prove his point of view.

Attention, too, has been paid to developmental deviations as a contributory factor in delinquency. Underdevelopment is more often listed by English[5] and continental writers than by Americans[6] as a factor of some importance. The most obvious explanation is the difference in social conditions and social opportunities between European countries and America. Undoubtedly the fact that our poor are reasonably well fed as compared to European poor lessens our number of underdeveloped children. Then, too, the relatively much greater opportunity for our youth to find wholesome employment makes adjustment much easier for American youth.

General overdevelopment exclusive of sexual function is more likely to be a factor of importance in male adolescent delinquents than in females. Very often the delinquency is of the kind known as incorrigibility. The boy refuses to mind his parents and teachers. He keeps late hours and associates with older boys. Truancy and running away from home to escape the confining atmosphere of school and home are common complaints.

Overdevelopment of sex characteristics, particularly in girls, is recognized as a factor of considerable importance by most writers on the subject. Healy[7] states, "Overdevelopment of sex characteristics in girls is a matter of considerable importance, since it often leads the girl to be unusually attractive to the opposite sex or leads her early to pay special attention to sex affairs." Burt[8] in discussing overdevelopment including that of sexual function writes, "the girl suddenly finds herself already a woman, while in self-control, in worldly experience, and in common sense she is little more than a child. The connection between female delinquency and this uneven development is as clear as it is common."

Many writers on juvenile delinquency have called attention to the frequency of physical defects found in doing careful studies of delinquents. One point to bear in mind is the fact that delinquency rates are higher among the economically and socially inferior groups of the population. Statistics, therefore, would have to be carefully analyzed. Burt[8a] working in London states, "In my series of cases nearly 70 per cent were suffering from such defects; and nearly 50 per cent were in urgent need of medical treatment." Furthermore, Burt finds "that defective physical conditions are, roughly speaking, one and a quarter times as frequent among delinquents as they are among non-delinquent children from the same schools and streets." Schumacher[9] who supervised a study made in a high delinquency area in Cleveland finds that in a 5 per cent random sample of over 2000 adolescent boys only one of the boys on whom complete physical examinations were made was noted by the examining physician as being an excellent physical specimen and he was not wholly free from physical defect. Healy,[7a] after comparing his findings with those of Gulick and Ayres'[10] study of conditions of young people in the general population, concludes, "So our series of delinquents appear certainly to no worse advantage physically than the general run of children."

Three conditions, however, stand out as being likely to be causally related to delinquency—sensory defects, diseases of the nervous system, and endocrine gland disturbances. Healy,[7b] who is most cautious about finding any relationship between delinquency and the physical status of the delinquent, nevertheless in discussing sensory defects writes, "In rare cases, however, we do know that these defects have played a part in the determination of delinquent trends." Slawson[11] states, "The presence of a relative excess of sensory defects among delinquent boys indicates the desirability of careful and frequent examinations of the sense organs of the pupils in the public schools, and, of course, of the subjects in the reformatory."

Healy[7c] finds a rather high percentage of severe head injury (nearly 4 per cent), while Burt[8b] does not list head injury in his table of pathological physical conditions, and, although not denying that a change in disposition often does occur, discusses it under conditions of doubtful significance. Healy[7d] states, "The nervous disease found most often has been chorea," and Burt[8c] agrees that "Choreic or sub-choreic conditions . . . are common." Healy's study is based on cases previous to the encephalitis epidemic while Burt's study includes

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delinquents suffering from encephalitis. Burt[9] fully appreciates the ease with which such children, post-encephalitic and choreic, engage in delinquent behavior and notes that "Unlike other physical disorders these nervous ailments are commonly the main cause of the child's delinquency. To treat them rightly, therefore, is as a rule the first and last essential." Many other conditions affecting the nervous system, such as epilepsy and syphilis, have been suspected of bearing a causal relationship to delinquency. Most of the accounts, however, are not very conclusive.

Although the science of endocrinology is still young, it is well known that the pituitary, the thyroid, the adrenals and the reproductive glands may retard or accelerate the general development of the body and influence profoundly the psychic functions. Disturbances of the function of these glands may be due to developmental deviation or they may have become deranged through disease. The question might well be raised whether or not the delinquency of the under- and overdeveloped boy and girl is due primarily to their physical maldevelopment or to their physiology in terms of the internal secretions. Sollenberger[12] has shown that a greater proportion of boys with a high androgenic hormone content as compared with boys with a low androgenic content express an interest in heterosexual activities, personal adornment and strenuous competitive sports.

Endocrine gland disturbances in delinquents in recent years have received considerable attention. Lurie[13] finds that "Approximately 20 per cent of the first thousand children studied at the Child Guidance Home showed various forms of glandular disturbances. In 9.3 per cent of these cases there appeared to be a direct causal relationship between the behavior disorder presented by the child and the endocrine disorder." Molitch and Poliakoff[14] in a study of 97 institutional boys show that "The boys with pituitary dysfunction were found to be unstable, immature and suggestible. Within the institution the pituitary boys were found to be above average in their school work but were below average in conduct and adjustment." In another study of 81 institutional boys, Molitch and Poliakoff[15] find that "The boys with gonadal dysfunction were found to be unstable, immature and infantile. The children with undescended testes were the most unstable but the entire group were less deviated than children with dyspituitarisms." Orner[16] studied the basal metabolism of 21 problem boys and concludes that "Although well within the normal range delimited by 90-110 the basal metabolic rate of the problem boys in this study is found to be five points below the theoretical normal. This suggests the possibility of some form of relationship between lowered dynamic activity of the organism and a lowered threshold of resistance to impulsive behavior." Wilder[17] in a recent paper on hypoglycemic states writes, "In reviewing the cases reported we come to the conclusion that certain types of crimes and offenses, characterized by increased aggressivity, lack of self-control, loss of moral inhibitions, impairment of judgment, are apt to be committed in hypoglycemia."

Now with these confusing and at times quite contradictory studies before us, let us see why it is reasonable to suppose that developmental deviations and pathological defects might play a part in an individual's delinquent behavior. From a psychobiological point of view, the healthy organism is one that maintains a state of equilibrium with its environment. It remains healthy as long as the variations in the environment do not exceed its capacity to adjust. For any given genus and species including man, the natural environment, except for some cataclysm, offers a wide margin of safety so that a failure to adjust implies some developmental deviation or pathological disorder in the individual organism. And, as a corollary to this, the greater the defectiveness of the individual from whatever cause, the lower the threshold at which disequilibrium sets in, so that the normal variations of the environment present more of a strain than the organism can meet.

Poor health means poor control. This is well illustrated in such cases as chorea and encephalitis but it is equally as true in all other disturbances of the psychophysical equilibrium. Oftentimes this is overlooked by the physician and he acts as though he believed because the external evidence of a disease—such as in the acute exanthemata for example—has disappeared that the patient is at once well. Yet depending on the patient's previous state of health and present vulnerability and in addition the severity of the infection and the treatment received, he may suffer easy fatigue, weariness and discomfort for weeks and months following the acute illness. The organism, however, will attempt to adjust itself but this adjustment may bring it into conflict with parents, teachers and companions. Parents and teachers may think that the child is a shirker trying to play on their sympathies and they react to the child accordingly. Thus they create situations which the child cannot master in a normal fashion and asocial or antisocial conduct results. On the playground such a child, because of his lack of strength and easy fatigue, cannot compete successfully. In order to overcome his feelings of difference and inferiority he may fall in with a delinquent group and find his satisfactions in delinquent behavior. Those illnesses in which sequelae occur, and thus a more or less chronic debilitated state, are in many respects even more conducive to such reaction formation.

The handling of the convalescence is an important matter. In some cases it is not sufficiently prolonged to permit complete recuperation. In other cases too much affection and attention is lavished upon a susceptible child and he exploits the situation for all it is worth. In such cases it may well be that the character defects so engendered are the primary cause of the future delinquent behavior. In fact, in all of what we have said in the above discussion, it must be clear that it is not the illness or the physical defect *per se* that gives rise to the delinquent behavior. Delinquency is not physical or organic; it is mental.

It is relatively easy to see the effect upon the total person of such defects as sensory ones, in particular sight and hearing, and of such pathological conditions as diseases of the nervous system and of the ductless glands

in view of their intimate relationship to the nervous system. However, any illness, acute or chronic, prolonged malnutrition, and physical defects appreciated by the individual as such, affect the total organism and hence that organisms response to its environment.

Good health is a preventive measure of no mean worth. One attack upon the problem of delinquency, therefore, is the provision for adequate nutritional, hygienic and medical care for all the people. Certainly every delinquent should receive a most careful examination with prompt attention to all remedial defects. In certain cases restoration to sound physical health may be all that is required to "cure" delinquency. In most cases, however, because of the involvement of the total personality the treatment of the delinquent will require attention to all possible factors. However, physical treatment whenever indicated should be the first step in treatment, for psychotherapy and environmental manipulation are not likely to be effective so long as the organism from a physiological viewpoint is unequal to the demands of everyday living.

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Physiologic Phenomena Which Are Misinterpreted as Nasal Disease*

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THE patient presenting himself with a complaint of nasal obstruction, excessive nasal secretion, headache which occurs in the morning, postnasal drip, frequent colds and the like, examination of whom discloses no obvious nasal deformity, and in whom the most diligent search can disclose no evidence of suppurative disease, often presents to the examining physician a problem baffling as well as trying. The fact that there is an important subjective element involved in many of these complaints adds greatly to the difficulty of diagnosis and treatment.

Many of these unfortunate individuals have been subjected to destructive nasal surgical treatment which has succeeded only in adding new symptoms to the old, leaving the patients in such a state that it is impossible for the physician to afford them relief. Yet, in the treatment of many of these patients, merely momentary consideration by the physician of the physiology of the nose and the probable factors producing alteration in it would make the cause of the complaint obvious and the logical treatment to be followed, clear.

Since the first descriptions of the paths of ciliary action in the nose and sinuses by Purkinje and Valentin in 1834, and Sharpey in 1835, there has been a gradually increasing interest in the subject of nasal physiology. Recently, much accelerated interest has been stimulated by such papers as those of Hill, Gray, Yates, Hansel, Heetderks, Hilding, Proetz[1,2] and Negus.

These studies show that the principal function of the nasal chamber is to act as what may be called an "air conditioner," and in this manner, to protect the more delicate structures of the pharynx, larynx, trachea and bronchi. The nasal chambers, with their elaborate ciliated epithelial covering, blood supply, cavernous blood sinuses, autonomic nerve connections, and mucous and serous glands are designed to perform this function of "air conditioning."

The turbinates or conchae, with their integument, are the principal structures involved in this process, and it may be stated that nasal physiology depends on the integrity of the turbinates. The anterior end of the inferior turbinate directs the inspired air upward, principally past the middle nasal meatus where the air is split into sheets so thin that in passing through the nasal chamber, the inspired air is cleansed of foreign material, brought to body temperature and completely saturated with moisture. The expired air follows essentially the same pathway through the nose during exhalation.

During inspiration and expiration a slight negative pressure is produced in the paranasal sinuses. While seeming unimportant, this negative pressure assumes considerable clinical importance when it is realized that in cases of septal deflection which produce marked differences in the size of the nasal chambers, the maxillary sinus on the side of the larger nasal chamber is three times more likely to be involved by suppurative disease than is the maxillary sinus on the other side, whereas on the narrower side having the smaller nasal chamber, the mucosa behind the deflection is frequently subject to polypoid degeneration, possibly produced by the congestion caused by increased negative pressure.

The seromucous glands of the nasal epithelium, possibly aided by transudation from the nasal capillaries, secrete mucus which forms a continuous blanket over the surface of the functioning part of the nasal epithelium. This blanket supplies moisture to the inspired air and engulfs foreign particles in its tenacious body to be carried by ciliary action to the pharynx. The amount of fluid supplied by the nasal mucosa varies, depending on the age of the individual and the demands of the environment, between a pint and two quarts each twenty-four-hour period. The nasal mucous membranes are most active at puberty and remain at the height of their activity until the late twenties, from which time on their activity diminishes and they gradually atrophy. This change is most marked in the cavernous tissues of the turbinates. The turbinate tissues are also influenced by the sexual development and activity of the individual.

Heetderks demonstrated that the two nasal chambers alternate in their activity, one side becoming engorged and blocking the passage of air, while the other is secreting, opening and allowing air to pass through. This alternate opening and closing of the nasal chambers has a periodicity which differs in different individuals and under differing environment, the alternations varying between half an hour and two hours. As the nasal chambers begin to open, mucus can be seen exuding from the mouths of the glands; these outpourings of mucus soon run together to form an unbroken blanket over the entire surface of the ciliated mucosa of the nasal chamber, protecting the underlying epithelium from contact with bacteria or irritants. The content of mucin in this blanket must remain close to 3 per cent. If it becomes more dilute or more concentrated, the blanket will have either too much or too little viscosity, according to the content of mucin in it, to be handled by the cilia of the underlying mucous membrane.

The cilia are continuous over the surface of the functioning portion of the nasal mucous membrane and beat at the rate of about 200 pulsations a minute in propulsion waves over the surface of the mucous membrane. The waves are directed posteriorly in the nose and in a circular direction toward the ostia in the sinuses. As a result, the entire mucous blanket is being steadily

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moved backward toward the choanae at a rate of about 0.5 cm. a minute. On reaching the choanae, the mucous blanket is carried to the lateral pharyngeal walls and is eventually swallowed. It has been estimated that the human normally swallows once every two minutes during the waking state and thus avoids an accumulation of mucous in the hypopharynx.

Cilia will not function if they are dry, and ciliary motion ceases at a temperature below 7 to 10°C. (44.6 to 50.0°F.) and above 40°C. (104.0°F.), and the frequency of beat is greatest between 18°C. and 33°C. (64.4° and 91.4°F.). It is well known that acid solutions paralyze cilia. Gray showed that paralysis of cilia may be produced by penetration into the cell of acids produced in the tissues or in the lumen of the cavity lined by mucous membrane. Lillie[8] demonstrated the effect of anions and cations on ciliary movement. He found that all sodium salts caused slowing and eventual cessation of ciliary movement; potassium salts allowed vigorous movement to continue if the anions were nontoxic; ammonium salts were intermediate in action. Lithium was even more harmful than sodium. Negus has shown that if the hydrogen ion concentration is lowered to a pH of 6.4 or less, ciliary action cannot continue. Buhrmester demonstrated that the average pH of normal human nasal secretion is 7.56. She found that in fifteen analyses of pus obtained from patients having nasal suppuration, the pH was lowered, on an average, to 6.48, the lowest value being 5.86.

Carbon dioxide is given off actively by the nasal mucous membrane; it reaches the nose in combination with buffer substances which remain behind after the respiratory exchange has taken place. If ventilation of the nose is restricted, outward passage of carbon dioxide cannot take place normally. Consequently, buffer substances will not be liberated as before. A diminished amount of buffer substance is available to combine with the acidulous end products of cell activity. In cases of swelling of the mucosa with diminished local respiratory exchanges, there is therefore a diminished supply of buffer substance with which to fix the acid. In addition, more general effect is present, as Lüscher has shown, that is to say, in the presence of nasal obstruction, the alkali reserve of the body is lowered. In the presence of obstructive conditions of the nose, the reactions of the epithelial secretions and probably of the tissue fluids in the affected region tend toward the acid side, with a corresponding decrease in the alkali reserve.

According to variations in the temperature and relative humidity of the inspired air, the cavernous tissue on the medial surfaces of the turbinates becomes more or less congested in order to vary the cubic capacity of the nasal chambers and by controlling the volume of inspired air to prepare the chambers for environmental changes. Variations in humidity have a much less marked effect on the cavernous tissue of the nose than do changes in temperature. Chilling of the cutaneous surfaces of the body has been shown to produce a vasoconstrictive effect on the nasal mucosa. This effect is thought to be mediated by the sympathetic nerve supply to the nasal mucosa through the sphenopalatine ganglion.

The most common complaints offered by patients concerning the nose are based on either misinterpreting normal physiologic action as disease or the effects of senile changes on the nose.

Misinterpretation of normal physiologic action. The alternating obstruction produced by the normal functioning of the nasal chambers probably is the most frequent subject of complaint. The practice of turbinectomy for the relief of this complaint in past years has been the cause of much real secondary pathological change in the nasopharynx, pharynx and larynx. Since a hyperactive nasal mucosa is a condition which the passage of time will overcorrect, an explanation of the physiologic action involved is usually sufficient to relieve the apprehension it causes.

The closing of the dependent side of the nose during sleep, caused by the action of gravity on the tissue fluids in producing a congestion of the mucosa on this side of the nose, is a frequent cause of complaint. These individuals may complain of dryness of the mouth and throat caused by breathing through the mouth, of headache caused by the pressure of swollen membranes, or nasal congestion on waking. Many such complaints can be relieved by the patient's assuming a higher position in bed, semi-reclining on two or three pillows. The complaints may be accentuated by the fact that a septal deflection occludes the side of the nose which is normally open during sleep. Dryness of the throat on waking may be relieved by humidification of the air in the patient's sleeping quarters and by avoiding open windows in cold weather. Whereas the relative humidity of air in winter in these latitudes is frequently of a 75 to 80 per cent saturation, it must be remembered that every elevation of 20°F. (11.1°C.) in temperature virtually halves the relative humidity, so that a very low humidity is usually found in sleeping quarters that are open to the outside air in winter.

In hypersensitive individuals, the normal discharge of mucus from the nose into the throat is a cause of frequent complaint, a condition which may be particularly marked at night in individuals who sleep supine, as a result of the direct dropping of mucus on the posterior pharyngeal wall, which sometimes produces an annoying cough. I have mentioned previously that the normal production of mucus may be as much as two quarts during 24 hours, and an explanation of this fact to the patient is usually sufficient to relieve the worries of the complainant.

The tendency of mucus to collect in the hypopharynx during the individual's sleep, a tendency which is the result of partial suppression of the process of swallowing during sleep and in part caused by the drying effect of breathing through the mouth, is frequently misinterpreted as a symptom or sign of disease. The unfortunate victim of this delusion frequently spends as much as an hour each morning in clearing his throat and gargling to get rid of what he considers "pus", when one clearing and two swallows would usually suffice. This practice also leads to the throat-clearing habit, and thus a vicious circle is started which can be relieved only by instant suppression of the impulse to clear the throat vice.

The symptoms enumerated under misinterpretations of normal function are usually diagnosed by the patient as those caused by "catarrh". A patient presenting himself with "catarrh" as a chief complaint only rarely will be found to have any abnormal condition.

Nasal complaints referable to age. The marked increase in the cavernous tissues of the turbinate bones at puberty has been mentioned previously. At the ages between 14 and 30, many individuals present the complaint of a "stuffy nose," with alternating obstruction. At inspection, these noses present the picture of marked engorgement of the erectile tissues of the turbinate bones without there being noticeable any especial tendency to excessive secretion. It can also be determined by the examiner that the responses to variations in temperature of the inspired air are more than normally marked. If the nasal membranes are shrunk by means of a suitable drug, it can be observed that the size of the nasal chambers is adequate. In former years, such individuals were often subjected to turbinectomy, which in removing the functioning tissues of the nose, afforded a temporary relief to obstruction at the expense of creating life-long pharyngeal irritation and a scabby nose.

It has also been mentioned that after the range of age between 25 and 30, the nasal mucous membranes, and particularly the cavernous tissues of the turbinate bones, begin to atrophy. As a result of this process, the nasal cavity becomes less and less efficient as an air conditioner. Dry air in passing through the nasal chambers extracts more and more of the fluid elements from the mucous blanket, leaving the more solid residue behind in the form of crusts. The inspired air rushes through the enlarged nasal chambers without being sufficiently cleansed or sufficiently humidified and on striking the posterior pharyngeal wall, immediately behind the choanae, sets up a region of inflammatory reaction by breaking the mucous blanket in this region. Peripherally from the inflamed region there is a stimulation of the secreting glands, and an increased postnasal drip. This syndrome explains the frequent hacking and coughing of elderly patients, who suffer from a dryness of the nasal mucosa which produces a subjective sensation of nasal blockage. As a result, such patients present themselves with the complaints of a stuffy nose, postnasal drip and frequent sore throats and colds that are said to "start between the nose and the throat."

The physician can deduce from his knowledge of the physiology of the nose that the treatment of this condition must be either a correction of the underlying tissue changes, the supplying of a more favorable environment or the use of stimulating and protective medications. To correct the changes caused by advancing years seems as yet beyond the powers of even the endocrinologist. The proper environment for a person affected with senile atrophy of the nasal mucous membrane is one in which the air is of such temperature, humidity and cleanliness as to require no work on the part of the nose. In the latitudes of the north and central portions of the Midwest, the winter environment resulting from the widespread use of central heating and the consequent low humidity, is likely to be especially unfavorable for such patients. This atmospheric condition is usually acute in hospitals and probably does much to account for the increase in the incidence of postoperative pneumonia in the winter. Persons who suffer from atrophy of the nasal mucosa will obtain much relief from humidification of homes and places of business. A relative humidity of 45 per cent at a temperature of 72°F. (22.2°C.) is generally found to be best suited to the needs of the human being. Elderly individuals with sufficient funds may be advised to seek such a climate as Florida affords, but many of them are made more uncomfortable by the dry air of the Southwest.

Stimulation of the secretory powers of the nasal mucosa will often provide a certain measure of relief. The expectorants are all of some value in the treatment of this condition, but the iodides appear to be of the greatest value. A properly used oil spray may produce a coating of oil over the mucosal surfaces to take the place of the absent or deficient mucous blanket. Since oil has been shown to have insufficient viscosity to be moved by ciliary action, when properly applied it may afford protection for a considerable time. The oil used should be a light mineral oil, uncontaminated by the usual irritants and vasoconstrictors such as camphor and menthol or ephedrine and benzedrine. Properly to use an oil spray, the nozzle should occlude one vestibule, the other vestibule should be closed with a finger, the mouth should be opened, the soft palate relaxed and the bulb of the syringe compressed with sufficient energy to blow the oil through the nose, against the posterior pharyngeal wall. Action of the spray should then expel a residue of the oil from the mouth as a fog of droplets. Mineral oil should never be inhaled, and a dropper should never be injudiciously used, because oil which reaches the alveoli may cause what is known as "oil pneumonia."

The effect of environment in producing alterations of nasal function. Occupations which produce constant irritation of the nasal mucosa or by rapid alterations in environment demand rapid functional changes in the nasal mucosa, are likely to be responsible, ultimately, for a physiologically hyperactive state of the nasal mucous membrane. This condition frequently can be observed in the nasal membranes of chemical workers exposed to irritating fumes and in those of farmers, oil station attendants and others whose work involves exposure of their nasal mucous membranes to sudden changes in temperature. Such an environment results in a congestion of the mucous membranes and an overproduction of mucus which is especially noticeable in the fluid elements. These patients complain of a stuffy, running nose with postnasal drip. Obviously, the treatment is to change the occupation; otherwise, the patient must endure the nasal symptoms produced by the environment.

The effect of inspiring air of a humidity too low to be conditioned by the nasal chambers is to produce a drying of the nasal mucosa by the passage of air through the nasal chamber. The effects produced and the therapy to be applied are similar to those of senile atrophy of the nasal mucous membrane. In a few instances, the effects of air of very high temperature and humidity can be observed, such as in the nasal membranes of laundry

workers long at the trade, where a marked disuse atrophy of the nasal mucosa may take place.

Alterations in nasal physiology produced by the glands of internal secretion. From the references made to the change in the cavernous tissue of the sinuses at puberty, it is apparent that there is a relationship between the development of the secondary sexual characteristics admittedly produced by the activity of the endocrine glands, and nasal function. This relationship is more sharply brought out by Collip and his co-workers[10] in their work on ozena. They have demonstrated that extreme atrophy of the nasal mucosa with the formation of fetid crusts, is the result of production of an insufficient amount of the estrogenic hormone. The administration of this hormone locally in sufficient dosage will produce marked remission of symptoms.

The condition mentioned is more common among women than among men, and on careful questioning of the patient, the first appearance of nasal symptoms often can be traced back to infancy. The condition appears to be general, however, being occasionally associated with delayed appearance of the menses, which when established are often painful. There is a moderate underdevelopment of the breasts and other secondary sex characteristics, and there is occasionally an associated deficiency in the secretion of the thyroid glands. For men, testosterone is also useful in relieving the condition.

The marked congestion of the nasal mucosa present just before and during menstruation may be due to hormonal influence. The headache associated with the menstruation of some women is often caused by swelling of the nasal mucosa, which in turn produces pressure in the nose. This particular type of headache can be relieved by shrinking the nasal mucosa. In some instances, dysmenorrhea is said to have been relieved by cocainization of the cavernous regions of the turbinate bones.

The increased activity of the nasal mucosa during sexual excitement is marked and in the presence of the so-called honeymoon coryza of newly married persons, the appearance of the mucosa may closely approximate that seen in hay fever.

Myxedema and hypothyroidism without myxedema produce characteristic changes in the nasal mucosa. The mucosa has a full, doughy appearance, rather pale, with a violescent tinge. The amount of congestion varies with the degree of hypofunction of the thyroid gland present in the individual under consideration. Not infrequently, nasal obstruction is the chief complaint. Administration of dried extract of thyroid gland will readily relieve the condition.

Disorders of the autonomic nervous system influencing nasal function. Although the mechanism of the production of vasomotor rhinitis and asthma is imperfectly understood, it is obvious that a condition of so-called vagotonia is present in association with vasodilation, transudation of fluid through the capillary walls into the tissue spaces and a marked increase in the secretions of the mucous and serous glands of the mucosa. This condition occurs frequently in the nose and is all too often mistakenly diagnosed as "sinusitis". A discussion of the treatment of atopic nasal reactions would carry me too far afield and will not be attempted here. The so-called physical allergies affecting the nasal mucosa, in which the characteristic reaction is brought about by the action of some physical agent such as a sudden rise or decrease in the temperature of the skin, exposure to sunlight and so forth, are often misinterpreted as being attacks of "acute rhinitis." An attempt at desensitization to temperature change should be made, particularly if a patient reacts to such sudden changes in temperature as are caused by getting out of bed in the morning, accompanied by a fit of paroxysmal sneezing. This can be done by means of sponge baths in which the differences in temperature of the water and the region of the skin covered are respectively lowered and increased.

Alterations in nasal function caused by the misuse of drugs. Because of the popular advertising of many nasal sprays, inhalants and washes, the number of people having the complaint of "catarrh of the nose" due to altered mucosal function secondary to the misuse of drugs, is constantly on the increase. The standard irritant used by our fathers was strong salt solution snuffed through the nose, often mixed with bicarbonate of soda because of the ability of the latter to "dissolve mucus." Although this pernicious solution is gradually losing favor to advantage of the better-advertised and even more irritating proprietary solutions of the present, it is still popular among a certain backward and old-fashioned group of people.

The effect of any watery solution which is used in the nose is to wash off the protective mucous blanket and to produce degenerative effects on the cilia. The toxic effect of the sodium ion on ciliary action has been mentioned previously. Washing exposes the mucosa to the action of pathogenic bacteria and produces in the noses of inveterate lavagers a state of chronic inflammation. If the solution is hypotonic, the water is absorbed by the mucosa and a boggy, hypo-active membrane with a seriously altered secretory power is produced. The chronic inflammation leads to the invasion of the submucosa by fibroblasts and an early and profound state of atrophy of the nasal mucosa may be produced by continued nasal lavage.

Camphor and menthol and volatile oils such as thymol and eucalyptol have long been popular remedies for nasal conditions when they have been incorporated into an oily base and blown into the nose. These substances act as local anesthetics to the nasal mucosa and although they produce the subjective sensation of opening the nasal chambers, observation shows that actually a turgescence is being produced and that the airway becomes diminished. Stark has demonstrated the destructive effects of low dilutions of camphor and menthol on the nasal mucosa, and Proetz[13] has studied the inhibiting effects of thymol on ciliary action. The continued use of these substances may ultimately be responsible for chronic congestion and inflammation of the nasal mucous membrane. The treatment for the condition is to prohibit the use of such drugs.

Sympathomimetic drugs such as epinephrine, ephedrine, benzedrine and the like, because of the frequency of their use, have become responsible for a large part of the nasal congestion which afflicts those guileless persons with low sales resistance and ready cash. It has been shown that epinephrine acts on some intermediate substance situated between the nerve endings and the contractile mechanism of the muscular cells. This substance can be exhausted readily, and in addition, the primary action of constriction is followed by secondary and refractory relaxation. As a consequence, a condition is produced in which more and more of the drug produces less and less effect, while the congestion of the nasal mucosa following relaxation of the smooth muscle of the vascular walls is more marked and ensues more rapidly after use of the drug. Chronic congestion of the nasal mucosa is thereby produced, and it is particularly marked in the nasal membranes of individuals who have been addicted to the use of these substances for some months.

Cocaine produces a similar condition in the nasal mucosa by means of a somewhat similar process. It is for this reason that cocaine should not be used for office treatment of patients having acute or chronic congestive conditions of the nasal mucosa. Cocaine produces, first, a very short period of shrinkage and then a refractory and continued period of congestion amounting occasionally to edema.

Historically, one of the first substances used to combat nasal congestion was dry snuff. This substance achieved great popularity in England, inasmuch as the inclement climate of that country, as well as the alternate baking and freezing produced by the primitive heating arrangements of English homes, tended to produce nasal congestion. This climatic effect is still noticeable in the adenoidal English voice. In my experience, the application of packs moistened in a solution of 25 per cent mild silver-protein (argyrol) to the middle nasal meatus, left in place for from 20 to 30 minutes, has produced an admirable reduction of congestion. By repeated use of such a measure, a cumulative shrinking effect can be secured. This is known as the "Dowling pack technic."

Alar collapse. In neurotic patients, as Lillie[7] has pointed out, so-called alar collapse frequently produces a subjective nasal obstruction. The alar cartilages are supplied with muscles that rotate the cartilage slightly outward and produce a rigidity of the alae nasi and maintain the patency of the nasal vestibules during forced inspiration. The alar cartilages and musculature of certain individuals are inadequately developed and thus normal expansion of the alae is difficult or impossible. Such patients, and an occasional normally-developed individual who does not bring the alar musculature into play during forced inspiration, collapse the vestibules of the nose by the suddenly increased negative pressure. Once they have learned the technic of collapsing the nasal vestibules, certain individuals use it in an attempt to demonstrate that their nasal chambers are inadequate, whereas it can be easily observed that during normal deep breathing, without sudden inspiratory spasms, the airway is perfectly open. Having such persons observe their nasal antics before a mirror, coupled with a demonstration of proper breathing methods, is often sufficient to effect a cure.

Conclusion

The majority of complaints referable to the nose are based on a misinterpretation by the patient of the normal functioning of the nasal chambers; he mistakenly regards such functioning as indicative of nasal disease. Other complaints may be produced by the attempt of the patient to remedy fancied diseases by self-medication. Understanding of the nasal physiologic processes will usually be sufficient for the physician to discover the true origin of the complaint and for him to suggest an appropriate remedy.

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The Diagnosis and Treatment of Leucorrhea*

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MY reasons for presenting such a lowly and shopworn subject for discussion at this time are specific. First, leucorrhea is the commonest and often the most troublesome condition that we are called upon to treat in office practice. Secondly, in the course of these treatments we have become convinced that probably none of us have fully appreciated the diagnostic importance of these discharges particularly in relation to their complications. Thirdly, there are facts which have seemed important to us in the etiology, prophylaxis and treatment of these various diseases, which I wish to present.

Leucorrhea in its generally accepted sense has come to mean any discharge, other than blood, in more than normal quantities from the female genital organs. As a standard we may accept the normal vaginal discharge as of sufficient quantity to keep the walls of the vaginal canal normally moist. This discharge should not require the use of a sanitary napkin except for the slight physiological increases which occur in some women just preceding and following the menstrual flow. The physical characteristics of the normal discharge are within rather narrow limits, constant and specific. The quantitative relationships of the various constituents are of great importance not only in the diagnosis but also in the rationale of treatment. Normal vaginal discharge is made up of a small amount of clear glairy mucus which contains small clumps of desquamated vaginal epithelial cells and a few leucocytes. The bacterial flora is varied but held in rather constant balance by the predominance of the Döderlein's bacillus. This organism acting upon the glycogen of the vaginal epithelium produces lactic acid which gives the vaginal secretion its usual acrid odor and maintains the normal pH of about 4.0. Variations in these relationships allow the other organisms, such as streptococci, staphylococci, colon bacilli, or foreign pathogens to multiply or enter the vagina and produce symptoms. By the same token, variations in the physiology of the genital tract at various ages may produce favorable conditions for the entry and growth of pathogenic organisms. Examples of this are the vulvovaginitis of children and the senile vaginitis of the postmenopausal woman.

Leucorrhea occurs frequently in the pre-adolescent or adolescent girl. Generally it is either ignored completely or inadequately treated on account of the time-honored conception of the sanctity of the hymen. We do a grave injustice to our growing girls when we allow ourselves or our patients to retain this idea. Many of the difficulties of the adult woman, both anatomically and psychically, could be avoided by a more sensible attitude toward needed pelvic examinations during childhood. We have examined many thousands of microscopic slides made from the pelvic organs of female children. They reveal a surprising number of pathological conditions including many instances of erosions of the cervix, adhesive vaginitis, and endocervicitis. We feel that many of them are due to insufficient drainage through an almost imperforate hymen. Dilatation of the hymen under gas anesthesia is usually sufficient.

In our vulvovaginitis clinic we have routinely examined the children in the knee-chest position. By this procedure, collection of discharge for examination is simplified and visualization of the cervix and vaginal walls can be done without difficulty. If treatment is found necessary, the ballooning of the vagina smoothes out the vaginal walls, allowing medication to be spread uniformly over its surface. If erosions persist, they can be lightly touched through the vaginoscope with the nasal cautery. Approximately 50 per cent of the young girls having discharge and seen in the clinic are infected with the gonococcus. These have responded very well to the usual procedures such as rest, cleanliness, silver preparations, and the estrogenic vaginal suppositories. A tremendous protective thickening of the vaginal mucosa can be produced in a few days by the estrogens. We have the feeling that the increased deposition of glycogen and the change in pH may be quite as important. When the infection persists or keeps recurring after treatments have been discontinued we feel that it is usually a new or reinfection.

The remaining 40 to 45 per cent of cases of vulvovaginitis are of a nonspecific character, although we are finding an increasing number due to trichomonas or yeasts. Many of the discharges seem to be associated with an overgrowth of the Döderlein bacillus. About 5 per cent of these little patients have placed foreign bodies in the vagina sometimes so long ago, they have forgotten about it. We have a collection of hairpins, safety pins, shoebuttons, and even buffalo nickels which we have removed from the vagina. One little Irish girl when asked why she had placed the nickel there replied that she hadn't, they were just playing telephone. The psychic trauma inflicted on these youngsters sometimes by years of specific treatment is tremendous. Every case of vulvovaginitis requires that a visualization of the vaginal tract be done. This can be readily accomplished through a tube of heavy paper rolled to fit and by reflected light.

There is a slight increase in the vaginal discharge in the adult woman. This is again increased after pregnancy although no definite pathology can be found to account for it. Many fastidious women at this time begin the use of various strong chemicals in douches not only to control the amount of discharge but also because they have become more sex conscious and dislike the odor of otherwise normal vaginal secretion. Strong contraceptive douches undoubtedly play an important rôle.

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They irritate and also disturb the natural protective balance of the vagina, thus allowing pathogenic organisms to gain a foothold. This is especially true of those douche substances which liberate chlorine. We have almost entirely discontinued the use of douches in treatment or contraceptive advice except those which have a specificity, such as iodine for yeast or lactic acid which is normally found in the vagina. In this connection, it has been our observation that the continued use of such devices as tampax have in some individuals seemed to result in persistent irritating discharges. We have been unable to determine whether this is due to retention of secretion or to the introduction of foreign material into the vagina. Several of the most irritating discharges have cleared almost immediately when the use of the foreign materials was stopped.

The commonest and most important leucorrheas we encounter in private as well as in clinic practice are those caused by trichomonas vaginalis or the yeasts. We encounter one or the other of these infections about twenty times as frequently as we do gonorrhea. These infections often occur together or may follow one another in rapid succession. It is a common finding in our experience to begin treatment of a patient for trichomonas vaginitis and to have her return a short time later or even during treatment with a pure culture of yeast in the secretion. We have learned to restudy our original diagnosis when the course of convalescence is not going smoothly. Our belief is that the change in offending organism is in some way due to the treatment or the changed condition in the vagina rather than to the fact that the second diagnosis was fumbled at the time of the original examination. In several instances we have found gonorrhea and trichomonas vaginalis together in the same secretion. Thus far we have never seen gonorrhea in the highly acid secretion of a yeast vaginitis.

Using the ordinary dark field condenser, we have observed in a few cases a spirillum or spirochetal type of organism which we have not definitely identified although it is most probably similar to the spirillum found in the throat. This responds readily to the usual treatment of vaginitis with the arsenical powders which have been advised for trichomonas. In an additional few cases, stained preparations have revealed the exciting organism to be one of the higher bacterial forms similar to the streptothrix. These have disappeared rapidly when treated with gentian violet and iodine douches.

We have set for ourselves a very definite routine of examination because we find that whether a patient gives leucorrhea as a part of her original complaint or not, we frequently find one of these important infective organisms. This is especially apt to occur when the other complaints are those of urinary disease, prolapse, menorrhagia, metrorrhagia, dyspareunia, pruritis or hemorrhoids. This statement will be further elaborated when we discuss the complications more at length.

Our method of examination is routinely as follows: First, we take a careful history with particular reference to onset, douching and menstrual habits, history of previous infections, obstetrical and marital history. On local examination we are careful to note the source of the discharge. Discharges that come from above the external os often suggest major pathology. In our experience they are in order of their importance, true endocervicitis, early endocervical carcinoma, polypi, cancer of the corpus or tube, intra-uterine fibroids.

Discharge which originates in the lower portions of the vaginal tract may be due to an excess secretion from the Bartholin glands, irritations or infections in the vagina itself or erosions of the cervix. The lesions produced by these various diseases are often quite characteristic. The reddened edematous vulva, bathed in yellowish pus, and the swollen pouting mouths of Bartholin's or Skene's glands which we find in gonorrhea is quite different from that caused by trichomonas or yeast. In gonorrhea there is usually no evidence of pruritus such as we find scattered over the reddened vulva and often about the anus in both trichomonas or the monilia infections. The rather scalded appearance of the vulva in these diseases may be continued around the anus causing deep fissures, intense pruritus, and added symptoms if hemorrhoids happen to be present.

The appearance of the vaginal walls of patients with trichomonas are often very characteristic. The small petechial hemorrhages which have given rise to the term strawberry vagina are usually most pronounced over the anterior fornix and portio of the cervix. They may be distinguished at once from the small bleeding points beneath the membranous flecks of discharge found in yeast vaginitis. The bubbly frothy discharge which is described as being pathognomonic of trichomonas may not be present and we find the organisms in the thick tenacious mucus coming from the cervical canal. Vulvar condylomata indicate the chronicity of the disease and occur frequently with any of these infectious diseases.

A plain water douche will often stop the motility of the trichomonads for twenty-four hours. Glycerine or any of the examining jellies will also produce the same result. The preliminary step in any vaginal examination should be the collection of discharge with an unlubricated speculum. Some of the discharge about the labia should, if possible, be included in the specimen because it is only in this region that trichomonas are occasionally found. Repeated examination on successive days and particularly immediately following the menstrual period may be necessary to arrive at the correct diagnosis. A drop of the secretion mixed with warm normal saline should be transferred immediately to a glass slide covered with a cover slip and examined first under the low power and then under the oil immersion magnification. The remainder of the discharge should be tested for pH by one of the simple indicators such as nitrazine paper. We have checked our readings obtained in this manner with readings obtained by a very sensitive pH electrode in the vagina and find them accurate enough for all practical purposes. The normal pH of the vagina should be about 4, that of trichomonas 6.5 to 7.5 and yeast 3.5. Combinations of the above infections naturally alter these averages. The slide is stained by the usual gram stain. Trichomonas cannot be identified by these usual staining methods but, of course, gonorrhea and yeast,

the spirilla and higher forms of bacteria take the stain readily. (Special flagellar stains serve to distinguish the trichomonas but the characteristic flagellar movement in the fresh specimen is more simple and accurate.) When yeast is found in the secretion, repeated examinations of the urine for sugar become a necessary part of the routine. An examination of the prostatic secretion of the husband should always be done in persistent cases.

As I have previously stated, one of my main reasons for presenting this subject was to open a discussion of the varied and important complications associated with leucorrhea. I should like to list them together and then discuss them separately. In order of their frequency, as we have found them, they are: urethritis and trigonitis, Bartholinitis, menorrhagia and metrorrhagia, general pelvic peritonitis and pelvic abscesses, obstetrical and postoperative morbidity, sterility and dyspareunia, arthritis, vaginal and cervical strictures and adhesions, and colitis.

Frequency of urination, dsyuria and nocturia are frequently an important part of the distressing symptoms of acute vaginitis. I shall not discuss these in association with gonorrhea. Dr. Norris Heckel and I have found that at least 45 per cent of those cases of trichomonas vaginitis which we have studied had either an acute urethritis or trigonitis. These lesions are very characteristic when seen through the urethroscope or cystoscope. The central portion of the lesion is a patch of pale bullous-like edema. Scattered about the periphery are the small petechial-like hemorrhages similar to those found on the vaginal walls. We have isolated trichomonas several times in catheterized specimens of urine and in several others a streptococcus similar to that which regularly occurs in symbiosis with these flagellates. This bullous edema may include the opening of the ureters and we have seen one case in which several urological operations had been done without relief. There was a marked hydroureter on both sides which Dr. Herman Kretschmer could not account for on any other basis except the aforementioned edema. Treatment of the vaginal infection quickly relieved the symptoms so effectively that the patient refused further examination.

Statements are made in most standard textbooks that bartholinitis is usually gonorrheal in origin and that bilateral bartholinitis is almost pathognomonic of gonorrhea. During the last two years, 90 per cent of the bartholin infections treated on our service have been associated with either trichomonas or yeast vaginitis.

We have recovered the trichomonas from two of these infected glands and from many of the others a streptococcus mainly of the arthrotropic variety. Cultures made from the vaginal secretion at the same time revealed a similar organism. Several of these patients who complained of definite arthritic pains in the arms, legs, or back were relieved by proper treatment of the vaginitis alone or in combination with intracutaneous injections of a filtrate prepared from their particular strain of streptococci after the method of Bizredka. We have never been able to isolate yeast from these infected glands but one of the severest infections in a bartholin gland we have ever seen occurred in a pregnant woman with a yeast vaginitis. Repeated negative microscopic examinations for gonorrhea and in most of the above patients negative complement fixation tests, whatever they mean, left little room for doubt as to the etiology in these cases.

The continuation of symptoms after surgical treatment had been carried out, particularly for mild procidentia, led us to examine the discharge more carefully and yeast or trichomonas infections were often found. We have extended this observation to include every case on which operative procedure is contemplated. This may be difficult in patients who are afflicted with menorrhagia or metrorrhagia. We have found, however, that repeated examination of these patients will reveal that some of them have one of these acute infections and nonsurgical treatment will often suffice. If the bleeding is not controlled by therapy for the infectious process, there can be little question but that the postoperative morbidity will be lower than if the surgery is done through an acutely infected field. We are convinced that both our postoperative and puerperal morbidity has been decreased since we became aware of the importance of these conditions notwithstanding many reports in the literature to the contrary. The cure of trichomonas or yeast vaginitis during pregnancy is an extremely difficult procedure but we feel that it is less hazardous than to have the patient come into labor with the acute infection still present.

We also have a very definite feeling that the gonococcus has been blamed for many of the general pelvic infections for which it was never responsible. During the past two years we have seen fourteen cases of acute pelvic infection, three of which went on to abscess formation, where no other causative agent could be found than the trichomonas or yeast infection. Of these two were in women 50 and 52 years old, respectively. We are all aware how infrequently gonorrheal salpingitis is found in women of this age. Some of these infections were relatively mild but several were accompanied by severe symptoms. The diagnosis was based upon a rise in temperature, in one instance to 104°, leukocytes as high as 16,000, pain and lower abdominal rigidity, palpable swellings in the region of the adnexa and occasionally some irregular bleeding from the uterus.

Some of the severest instances of pain at intercourse are caused by the irritation set up by these acute infections. When they become more chronic, the constant irritation of the carunculae and the external urethral orifice are enough to make women avoid sexual relations. I have in my files the history of a patient who consulted us for a sterility of eight years duration. We found an exophthalmic goiter causing a basal metabolic rate of +52, an almost imperforate hymen and an infection with trichomonas vaginitis. This patient had previously consulted two physicians and had been told once without vaginal examination that time and nature would undoubtedly remedy her condition. The changes which occur in the normal reaction of the vaginal secretions in addition to the changed bacterial flora are as important

factors in the general problems of sterility as is chronic prostatitis in the male.

Particularly in the adolescent and the menopausal woman, where the resistance of the vaginal mucosa is lowered, the changes produced by these infections may be pronounced. Adhesions and troublesome constrictions of the vaginal canal can occur. The vicious circle is completed by inadequate drainage and marked anatomical changes may result.

Much has been written about the foci for reinfection in trichomonas vaginitis. These reports dealing with reinfection from the stool have been in the negative. They have been based for the most part on routine examinations of stool specimens, many of them obtained by removing a sample from the rectum with a lubricated finger. We have attacked the problem in the reverse direction. We have recently analyzed the routine stool examinations conducted by the laboratory of the Presbyterian Hospital during the year 1938-1939. There were 3,323 stools examined and cultured; 103 of them contained trichomonas. Twenty of them contained trichomonas and amoeba histolytica; 153 of them contained amoeba alone. We were led to this study by finding ten patients whom we were treating for trichomonas vaginitis who also harbored trichomonas alone or in combination with amoeba in the stool. In a few additional patients where the medical men have coöperated, we have examined the vaginal secretions of these patients who were unaware of excess vaginal secretion, and in some of them we have found the flagellates. Thus far we have found only one instance of amoeba in the vaginal secretions. We believe, however, that there may also be a connection between the diarrheal stool and yeast vaginitis. In this connection, in two instances we have apparently proved the direct connection between the use of saliva as a lubricant for sexual intercourse and a recurrent yeast infection of the vagina. The same strains were isolated from the saliva in the husband and the vaginal infection responded readily to treatment when this practice was discontinued.

The general treatment for the acute infections of the vagina are essentially the same. General bodily resistance is increased by the usual methods. This may include reduction or addition of body weight, treatment of anemia, removing foci of infection, such as teeth or tonsils, or readjusting the basal metabolism. DeLee reports cures of vaginitis by the giving of thyroid by mouth. The prostatic secretion of the husband should be examined. It would seem that many of the nonspecific prostatic infections are due to the nonspecific vaginal infections. A condom should be used as prophylaxis for both parties during the period of treatment. Examination of the stool, particularly the diarrheal stool, should routinely be done—at least in recurrent cases. If trichomonas are found, vioform or stovarsol by mouth will aid in cure.

The local treatment is based on restoring and maintaining normal conditions in the vagina. In trichomonas this can be best accomplished with simple milk sugar followed by lactic acid douches. We have not found it necessary or desirable to add to this powder irritating substances, such as citric acid, resorcinol, etc. Good results may also be obtained with the arsenical preparations, such as the powder devised by Gellhorn, Devegan, etc. These are expensive and in our hands have not given as good results as the simple procedure just mentioned. We have also had some very severe local reactions in sensitive individuals to the arsenicals. Hypertonic salt solutions are effective but as in many of the stronger chemicals used as douches, we did not obtain results as regularly as we do with the more nearly physiological solution of lactic acid, drams one to two quarts of warm water. We have also had some very severe burns with the picrate combinations and one of our confreres in Chicago had a patient who died on the examining table shortly after the insertion of silver picrate vaginal suppository.

The yeast infections, especially those producing high acid concentration, are quite sensitive to the analine dyes and iodine. Daily painting of the vaginal walls and introitus with one per cent gentian violet, Lugol's solution or for those who can tolerate it, 50 per cent tincture of iodine, produce prompt relief. If treatment is continued for several weeks with iodine douches, one-half to one dram to two quarts of warm water once daily in combination with an iodine capsule, such as that advised by Hesseltine, cure is usually assured.

We do not resort to cauterization of the cervix for leucorrhea now as frequently as we did in the past. Some observers make the statement that all erosions can be cured by producing normal acidity in the vagina. We have not had such uniformly good results.

In conclusion, I should say that I do not feel that all the ills of the female pelvis are due to leucorrhea and its attendant organisms. I do feel, however, that a more thorough study of them will help to solve many of the still unknown facts and lessen the grief for our patients and ourselves.

Modern Conceptions of Backache*

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BACKACHE is one of the most common complaints met with in the practice of modern medicine and it presents problems in differential diagnosis which tax the diagnostic ability of many physicians. In the solution of these problems the value of a carefully recorded history and a thorough physical and laboratory investigation cannot be over-emphasized. Compensation boards and insurance companies are constantly confronted with the difficulty of assessing accurately the degree of disability and the relative importance of the causal factors advanced by the patient. As their decision will depend largely on the opinion of the physician in charge, it behooves him to be thorough in his investigations and sound in the conclusion which he draws from the facts presented by the patient. It is probable that no complaint is more frequently the cause of litigation and dispute than is chronic disabling backache. It should follow, therefore, that the consideration of the etiologic factors and the methods of diagnosis involved in the solution of chronic backache will be of interest to every practicing physician.

Backache is not a disease but may be the symptom of a multiplicity of varying disorders, the elucidation of which frequently presents problems of overwhelming difficulty. The classification in table I is not exhaustive, but for practical purposes it presents a summary of the more common causes of pain in the back.

TABLE I.
Classification of Backache According to the Cause

I.	Backache caused by acute or chronic fatigue
II.	Psychoneurotic backache
	A. Coccygodynia
	B. Railway spine
III.	Backache of pregnancy
IV.	Backache resulting from infectious diseases
	A. Influenza
	B. Pneumonia
	C. Smallpox
V.	Postoperative backache
VI.	Lumbago
	A. Fibrositis or myositis
	B. Postural strain
	C. Sacro-iliac disease
	D. Spondylolisthesis
	E. Congenital anomalies
	1. Spina bifida
	2. Sacralization of the transverse processes
VII.	Backache caused by diseases of the kidney
	A. Tumors
	B. Perinephritic abscess
VIII.	Backache caused by pressure
	A. Tuberculosis of the spinal column
	B. Aneurysm
	C. Neoplasms
IX.	Traumatic backache
	A. Fractures of the vertebrae
X.	Backache caused by scoliosis
XI.	Backache caused by protrusion of an intervertebral disk

Acute backache which follows the season's opening tennis match, or an afternoon of enthusiastic weeding of the garden, is so well recognized that further elaboration is hardly necessary. In cases of this type of backache the stiffness and pain are usually the result of over-use and consequent fatigue of the muscles and ligaments of the back. Rest and treatment with infra-red rays or hot baths will usually result in a rapid subsidence of discomfort within a few days.

The chronic variety is etiologically related to the acute variety. It affects persons who are in an occupation in which stooping or bending is necessary. It is frequently seen among those persons performing arduous labor. Careful examination in such cases frequently will disclose early roentgenologic signs of hypertrophic changes in the margins and facets of the vertebrae. The results of treatment are less dramatic in this variety of backache but the use of physical therapy combined with supportive belts and the adoption of a less arduous existence will alleviate most of the discomfort from which these patients suffer.

While coccygodynia may frequently be the result of severe trauma resulting in fracture or dislocation of the coccyx or even may result in subsequent traumatic arthritis of the sacrococcygeal articulation, this is not the type of psychoneurotic backache which is most frequent. In many cases the patient is a woman who is suffering from chronic nervous exhaustion and complains of pain over the end of her spine after she has been sitting for half an hour or more. Relief is usually obtained on rising and walking about but when a sedentary position is resumed the symptoms recur. The pain, which is dull and gnawing in character, may extend down the back of the thighs. Roentgenologic examination rarely demonstrates any deformity of the coccyx and rectal examination usually will reveal a freely mobile terminal segment. Pain is frequently present only over the tip of the coccyx. In many instances, however, digital examination of the upper part of the rectum will disclose a spasm of the coccygeus muscle. Although excision of the coccyx may result in temporary improvement, the same symptoms usually recur in a few weeks. Reassurance and treatment by means of heat, air cushion, or massage of the coccygeus muscle as recommended by Thiele will produce better and more lasting relief.

In those cases in which there is a diagnosis of "railway spine" the complaint is a form of pain in the back for which no adequate organic cause can be found. Radiologically and clinically the findings are conspicuous by their absence, yet the sufferer usually has had a severe injury and frequently has experienced sufficient psychologic trauma to unnerve an otherwise robust man. Often, a compensation settlement is impending and once this has been satisfactorily disposed of the pain in the back improves. It is very difficult to be sure that the patient is a malingerer and such an opinion should only be considered after a most exhaustive study.

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In another type of psychoneurotic backache the patient may, as the result of an injury or illness, become conscious of pain in the region of the back, but little can be discovered by examination. It differs from the type of backache that is classified as "railway spine" in that there is no compensation claim involved. These patients frequently respond to a proper approach and reassuring advice.

Backache of Pregnancy

The later months of pregnancy frequently are made trying by an aching pain in the back which renders almost any position uncomfortable. The pain is situated in the lumbosacral and sacro-iliac regions and extends across the back and around to the anterior aspect of the lower part of the abdomen. Many pregnant women obtain relief by wearing a well-fitted supportive corset. Much of the pain results from softening of the sacro-iliac ligaments and increasing mobility of these articulations. The pain is intensified by the stretching of the utero-sacral ligaments by the enlarged anteriorly inclined uterus.

Backache of Infectious Diseases

The prodromal stages of many of the acute infectious fevers are accompanied by backache. In cases of influenza, pneumonia and smallpox backache is a prominent and most distressing early symptom. Its nature is obscure but it is probably caused by the toxemia.

Postoperative Backache

Postoperative backache is well recognized and is frequently the most distressing complaint during the first few days following operation. It comes on within twenty-four hours and results from a prolonged period of rest on a hard flat surface, in the dorsal decubitus position. During the operation the undue pressure on the patient's body, combined with the extreme degree of muscular relaxation obtained by the anesthesia, permits overstretching of muscles and ligaments. The backache persists for several days but responds well to the application of heat, sedative, massage and a firm binder.

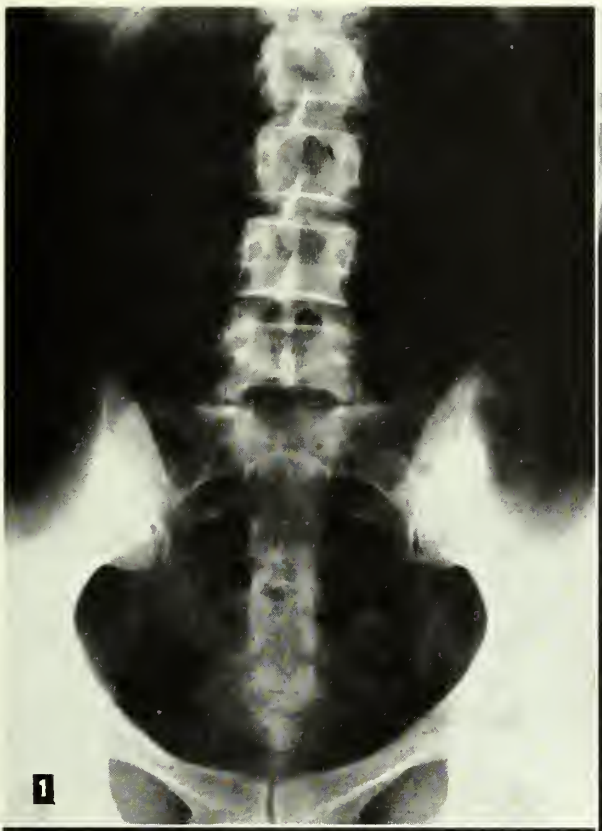
Lumbago

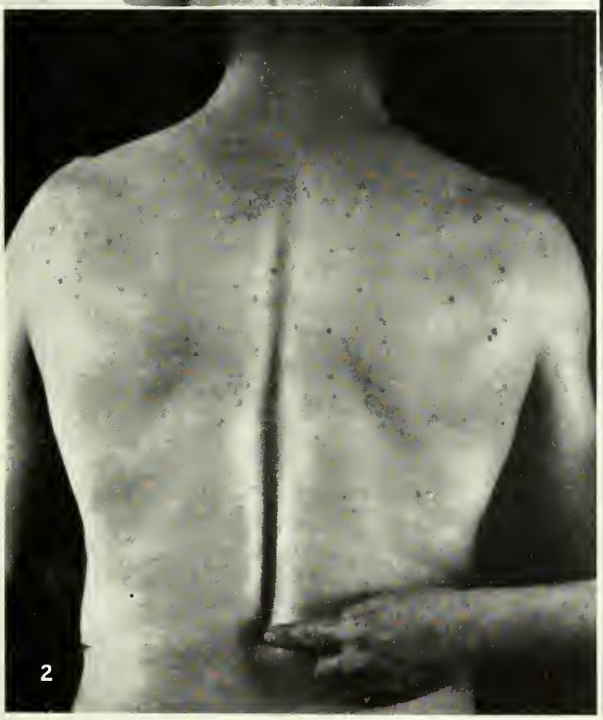
Lumbago was the refuse heap onto which were cast, by the older physicians, all the inexplicable pains in the lower part of the back. As science advanced, however, first one, then another, specific cause for backache was discovered. As a result of the recognition of spondylolisthesis, protrusion of the intervertebral disk, arthritis of the articular facets and tumor of the spinal cord, physicians have been encouraged to search for a definite cause of backache and are not satisfied with a diagnosis of lumbago and the prescription of a placebo. Thus, the diagnosis of lumbago is being made with decreasing frequency.

Fibrositis. Fibrositis, which originally was accepted only in the British schools, is being recognized more generally as an entity in this country. As the result of a focal infection or circulating toxins, a fibrous reaction occurs in the fasciae of the muscles and tendons at their insertions into the bone or in the intermuscular strata. This causes an inflammatory reaction at these sites and is the cause of pain. Although painful nodules have been found along the posterior portion of the crests of the iliac bones, over the sacro-iliac joints and vertebral spines and in the region of the lumbar or occipital muscles, they do not occur in all cases of fibrositis. Pain and tenderness to pressure in these situations, in the absence of roentgenologic evidence of organic change, should make one suspect the presence of fibrositis, a suspicion capable of being sustained by the success which attends the use of physical therapy, deep kneading massage and the elimination of possible foci of infection.

Postural strain. Poor posture, whether it is the result of bad habits or the result of an organic defect, if maintained for a long time will result in structural changes, lessened muscular tone and pulmonary inefficiency. Impaired oxygenation of the tissues and still further lowering of muscle tone will establish a vicious circle, the end results of which are lowered resistance to disease, predisposition to the occurrence of scoliosis, anemia, ill health and chronic backache. The importance of correcting minor faults in body mechanics in their early stages cannot be over-emphasized. A survey of all the school children of one of our large western cities, which was made a few years ago, disclosed that 35,000 had defects in their body mechanics while only 8000 had cardiac lesions. In one of our great universities, physical examination disclosed that only 20 per cent of 2200 students had a normal spinal contour. We are convinced, from the examination of a great number of patients, that much of the backache with which one is confronted in general practice is the direct result of poor postural habits in youth. These poor habits are aggravated by the crouching attitudes adopted by the average man or woman when driving an automobile or "resting" in the so-called comfortable chairs of modern design. From an orthopedic point of view, therefore, there is much that can be said in favor of the erect posture and straight backed chairs of the Victorian Era.

Sacro-iliac disease. Sacro-iliac sprain, or involvement of the sacro-iliac articulation by tuberculosis or hypertrophic arthritis, or other infections, may give rise to symptoms that are comparable. Weakness and pain in the back, which are increased by exercise but relieved by rest and application of heat, are common symptoms. In some cases the pain extends into the leg and occurs in the region supplied by the sciatic nerve. In other cases localized tenderness on pressure, both over the joint and the upper portion of the sciatic nerve, is a prominent sign. Coughing and sneezing may exaggerate the discomfort. In some cases roentgenologic examination reveals definite involvement of the joint (fig. 1), but in other cases the roentgenologic findings are negative. A measure of relief often follows rest, the application of heat and the use of a sacro-iliac support. This relief may assist one in deciding whether surgical fusion is indicated especially in cases in which the patients are young persons who must lead an active life. If rest and the use of a supportive corset do not produce relief, it is unlikely that a fusion operation will relieve the pain entirely.





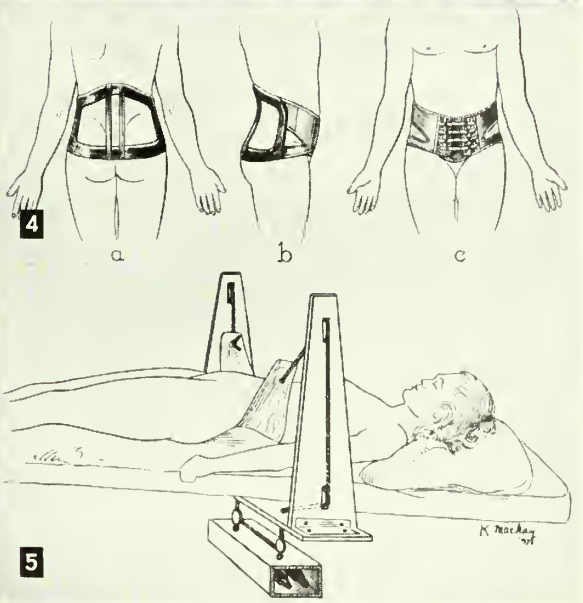


Fig. 1. Marginal sclerotic changes in both sacro-iliac joints.
Fig. 2. Typical deformity of spondylolisthesis with displacement of the fifth lumbar vertebra forward and downward. The finger points to the eminence and the shadow demonstrates the lumbar sulcus caused by the increased lordosis.
Fig. 3. Scoliosis with S-shaped deformity.
Fig. 4. Rocking-chair type of back support made of steel and leather.
Fig. 5. Lumbar sling, which produces hyperextension of the lumbar region.

Osteo-arthritis may cause symptoms similar to those we have described, if the sacro-iliac and lumbosacral joints and the lateral facets of the vertebrae are involved. Before deciding that the pain is the result of osteo-arthritis one should be very careful to exclude all other sources of pain, since many patients have the most extensive forms of osteo-arthritis with surprisingly little discomfort. In cases of osteo-arthritis the pain may result from mechanical interference with the function of the joints involved or it may be the result of pressure on the nerves by osteophytic outgrowths which extend into the intervertebral foramina. In the latter case definite radiation of pain may occur in the region supplied by the affected spinal nerve. Application of heat, massage, the use of a Hubbard tank or diathermy, elimination of foci of infection and the wearing of a back support will tend to alleviate the pain but no physiotherapeutic measure can correct gross structural defects. In cases of cervical osteo-arthritis in particular, neck traction frequently is very beneficial and may result in relief.

Spondylolisthesis. Spondylolisthesis may be defined as a subluxation of a vertebra, usually forward. It most commonly occurs in the lumbosacral region. Chronic backache, existing for years, is the most common symptom, and is present in more than 80 per cent of cases. Forward and downward displacement of the lumbar vertebrae is the most common deformity. In our series of cases males were affected twice as frequently as females. No age was exempt but advice was sought most frequently by patients who were between 40 and 44 years of age. While the underlying cause in most cases was a congenital defect of the pedicles and separation of the neural arch, trauma may be the exciting cause and in some cases there is sufficient ground for the belief that trauma alone is responsible for the condition. The most common symptom is backache, which is increased by bending and by hard labor, but relieved by rest. Pain and tingling in the sacro-iliac region and along the distribution of the sciatic nerve occurred in about 25 per cent of 583 cases, but true paralysis is rare.

Diagnosis can be made in many cases by inspection of the back. If the spondylolisthesis is well developed, inspection will disclose lumbar sulcus with a well-marked shelf formed by the prominent spine of the affected lumbar vertebra. This is characteristic and catches the eye more readily than does the shortened torso or telescoping of the body into the pelvis (fig. 2). For conclusive proof, however, a lateral roentgenogram of the affected region is necessary. In typical cases it will show the characteristic displacement of the vertebrae above on those below and in the congenital type, the laminar defect is usually well demonstrated. In 70 per cent of the cases observed at the clinic the patients had been leading arduous lives, which confirms the impression we have gained that the stresses and strains of labor are an important exciting factor. In 48 per cent of the cases a history of trauma was obtained. In many cases the patients probably would have gone through life without symptoms had their activities been less severe. In 10 per cent of the cases in which a diagnosis of spondylolisthesis was made at the Mayo Clinic, the condition was discovered in the course of a roentgenographic examination.

Treatment. In 10 per cent of the cases the condition was asymptomatic and treatment was not necessary. In those cases in which the disability was slight and the patients were engaged in a sedentary occupation, the use of physical therapy to lessen the muscular spasm and pain was recommended and they were advised to wear a well-fitted lumbosacral support, or corset, and cautioned against any heavy lifting or excessive bending. In acute cases in which the condition is caused by severe trauma, efforts may be made to reduce the displacement by vertical traction on the legs. In cases in which pain and disability are severe and circumstances demand that the patients follow an active type of life, spinal fusion by means of the double bone graft, as advocated by one of us (Meyerding), is the method of choice.

Congenital anomalies. Congenital defects, such as spina bifida or sacralization of the last lumbar vertebra, either unilaterally or bilaterally, may be the cause of backache. As both of these conditions are found frequently during the course of the general examination in cases in which no obvious disability is present, one is inclined to minimize their importance. When symptoms are present the pain and discomfort not infrequently are unilateral and are noted on the side on which no sacralization is present. It is possible that a unilateral sacralization may lead to a lumbar scoliosis as a result of alterations in the articulating surfaces. This in turn might result in pain and disability but we feel that in almost all cases the condition can be ignored or else treated along conservative lines with physical therapy and supporting belts. Active surgical treatment in our opinion is rarely necessary, and when employed consists usually of fusion.

Backache Caused by Diseases of the Kidney

Pain in the back, which results from the presence of tumors of the kidney or of the retroperitoneal space, usually is associated with symptoms that are referable to the genito-urinary tract. The presence of blood or pus in the urine, particularly if it is associated with a palpable swelling in the renal region, will immediately suggest the necessity of pyelography and the opinion of a urologic consultant. Treatment of the backache will resolve itself naturally into treatment of the renal condition.

Backache Caused by Tuberculosis of the Spinal Column

Tuberculosis of the spinal column is being recognized much earlier now than was the case in previous years. It is almost a rarity to see a patient with the gross kyphotic deformity that characterized the malady originally described by Percival Pott. This improvement in diagnosis is to a large extent due to the increasing tendency to make roentgenographic studies of the bone in all cases in which persistent pain is experienced. It is only in this way that physicians can hope to identify tuberculosis or tumors of bone at an early stage. Confirmatory evidence of exposure to infections, the phys-

ical findings, and positive Mantoux tests are of assistance in making a diagnosis but in the early stages of which we speak the diagnosis is a radiographic one and not infrequently it is only presumptive. A narrowed intervertebral space and a cloudy erosion of the contiguous margins of bone should cause one to suspect the presence of tuberculosis.

Tumors of the Spinal Column

Primary tumors or metastatic involvement of the vertebral bodies may produce characteristic roentgenographic features, but, as a rule unless a biopsy has been performed one can only make a diagnosis of a malignant lesion. The occurrence of "night pain" that is unrelieved by rest, and the presence of progressive loss of weight and strength or the presence of Bence Jones protein in the urine and "greasy appearance" and evidence of myeloid immaturity in the blood smear should suggest the presence of a malignant lesion that has involved the bone marrow. It must be borne in mind that aneurysms causing erosion of vertebrae may produce backache with pain of dull boring character.

Backache Caused by Fracture of the Vertebrae

The diagnosis of fracture of a vertebral body or of its processes is usually not difficult to make. The history of a severe injury, the presence of localized pain that is associated with muscle spasm, and swelling or discoloration in the traumatized region make radiologic investigation a necessity. In cases of severe trauma the presence of a fracture is usually recognized with ease, but in cases in which any doubt exists anteroposterior, lateral and oblique roentgenograms may be necessary. This is of particular importance in cases in which claims for compensation are likely to arise. It is in reference to this compensation angle, in particular, that the importance of oblique roentgenograms should be stressed for without their aid it may be impossible to identify a fracture of an articular facet. Fracture usually occurs either as the result of direct or indirect violence but it can follow a crushing injury caused by a "fall" or can be caused by a sudden spasmodic contracture of the psoas major muscles. The application of a body cast, while the spinal column is hyperextended by placing the patient on a Goldthwaite frame produces the best anatomic results but if the articular facets are fractured or if the tip of a transverse process has been avulsed, surgical removal of the loose fragment often produces more immediate relief. Surgical fusion is used as a last resort for relief of pain following vertebral fracture.

Backache Caused by Scoliosis

Scoliosis may be present for a considerable time before the deformity attracts the attention of the parents or pain or disability disturbs the patient. Whether functional or organic, the secret of success in treatment depends on early diagnosis and the persistent use of remedial exercises or the use of spinal support, or even surgical fusion in progressive deformity and disability (fig. 3).

TABLE II.
Situation of Pain in 185 Cases of Protrusion of an Intervertebral Disk

	Cases	
	Number	Per Cent
Low back pain simultaneous with extension of pain	40	21.6
Low back pain preceded extension of pain by average of seven years	112	60.5
Sciatic pain preceded low back pain by average of nine years	9	4.8
Low back pain without extension	8	4.3
Low back pain with extension other than sciatic	6	3.2
Sciatic pain without low back pain	10	5.4

TABLE III.
Relation of Trauma to Protrusion of the Intervertebral Disk (300 cases)

Injury	Cases	
	Number	Per Cent
Injury immediately preceding onset of symptoms	112	37.3
Injury not related to onset of symptoms	64	21.3
No injury	124	41.3

Backache Caused by Protrusion of an Intervertebral Disk

The attention of the medical profession was directed to the part played by a protruded intervertebral disk in the causation of sciatic and "lumbago" by Goldthwaite, of Boston, by Middleton and Teacher, of Glasgow, in 1911. Laminectomy was performed for the cure of such a condition by Adson in 1922 and the patient is alive and well today. Owing to the great advance in the knowledge of this subject, the medical profession and compensation and insurance boards have become intensely interested in the condition as a potential cause of disabling backache and sciatic pain. In a recent study of 185 cases, made here at the clinic, 95 per cent of the patients gave a history of low back pain (table 2). Since 1922, 300 patients have been subjected to operation and an accurate record of their postoperative progress has been kept. Two hundred and twenty-six were males and seventy-four were females. The average age of these patients at the time of operation was 40 years. Table III shows the relationship to trauma and protrusion of an intervertebral disk. In 242, or 81 per cent, of the 300 cases, intermission of symptoms was a characteristic finding. Since protrusion of the intervertebral disk occurs most frequently in the lumbosacral region, pain along the distribution of the related sciatic nerve is the most common symptom. However, protrusion of a disk may occur at any level of the spinal column. It may cause pain and paresthesia along the associated nerve trunks. The symptoms are unilateral in 75 per cent of cases. In a case of unilateral sciatica in which examination discloses tenderness to pressure along the course of the sciatic nerve, diminution of the Achilles tendon reflex and a positive Lasègue's sign, a diagnosis of protrusion of an intervertebral disk should be considered and a nurologic investigation carried out (table IV). In 66

per cent of the 285 cases in which spinal puncture was performed, the value for the total protein in the cerebrospinal fluid was more than 40 mg. per 100 cc. While this is considered as confirmatory evidence and as an additional reason for roentgenographic examination of the spine following the injection of lipiodol or air into the spinal subarachnoid space, it must be remembered that in 34 per cent of the cases the value for the total protein was below this figure. A normal concentration of total protein in the cerebrospinal fluid, therefore, does not exclude the presence of a protruded intervertebral disk. In addition to the symptoms and findings which we have mentioned, initiation of pain by coughing and sneezing is an important symptom. Nocturnal aggravation of pain is most significant (table V). A narrowing of the intervertebral space, as demonstrated by roentgenographic examination, is suggestive but it may be absent when an actual protrusion is known to exist. When the clinical history and the neurologic findings indicate the presence of a protruded disk, final confirmation may be obtained by roentgenographic examination of the spinal column following the injection of air or of some radio-opaque substance like lipiodol into the spinal subarachnoid space. The presence of a persistent defect in the roentgenogram is considered definite evidence of an intraspinal lesion, and laminectomy is recommended. This decision is reached only when the defect coincides with the level of the lesion previously determined by clinical methods. Spinal fusion and removal of the ruptured intervertebral disk are sometimes indicated when definite lumbosacral arthritis, fracture of a vertebra or involvement of the facets co-exist.

TABLE IV.
Neurologic Signs in 285 Cases of Protrusion of Intervertebral Disk in the Lumbar Region

Neurologic Signs	Cases	
	Number	Per Cent
Positive Lasègue's sign	231	81.0
Sciatic tenderness	172	60.3
Achilles reflex diminished or absent	171	60.0
Hamstring reflex diminished or absent	51	17.9
Muscular paresis	63	22.1
Loss of sensation	62	21.7
Neurologic examination objectively negative	17	5.9
Neurologic examination objectively negative, except for positive Lasègue's sign or sciatic tenderness	42	14.7

TABLE V.
Symptoms in 285 Cases of Protrusion of the Intervertebral Disk in the Lumbar Region

Symptoms	Cases	
	Number	Per Cent
Unilateral sciatic pain	215	75.4
Bilateral sciatic pain	42	14.7
"Night pain"	61	21.4
Accentuation of pain by coughing and sneezing	151	52.9
Paresthesia	121	42.4
Sphincteric incontinence	14	4.9

Diagnosis

The more severe forms of injury are hardly germane to this discussion since their care and treatment require immediate hospitalization. The diagnosis usually is obvious, and in cases in which it is not, the condition is such that the primary object is to counteract shock rather than aggravate the degree of collapse still further by overenthusiastic investigation. The prime object here is to save the life of the patient, and then only when all immediate danger has passed, make an accurate diagnosis. In the general routine of office practice, however, the patients are ambulatory and, therefore, the investigations can be leisurely yet thorough. In all cases the entire body should he exposed to view; failure to do this and to observe the minor alterations in the normal body contour, may result in spondylolisthesis heing overlooked. The presence of a lumbar sulcus and shelf, as shown in figure 2, is sufficient evidence to the trained eye to make a diagnosis possible. When the patient is clothed, it is not possible to form an accurate idea of the posture or the presence or absence of pelvic tilt or spinal curvature, but with all garments removed the slightest departure from the normal can be immediately detected and its cause sought. Alterations in gait will call attention to the possibilities of inequality in the length of the legs or to the presence of congenital dislocation of the hip or to other pathologic conditions in the region of these articulations. The presence of muscular spasm, whether visible or palpable, immediately suggests to the trained physician the presence of some underlying lesion which will be further corroborated by limitation of range of movement of the spinal column or hip joints, by the elicitation of localized pain on movement or percussion and by the presence of hypersensitivity to the application of heat or cold. "Boarding" of the spinal column with a limited expansion of the thorax and pain even in the absence of deformity suggest the presence of spondylitis. A positive Ober or Gaenslen test or a positive Kernig sign, while not pathognomic when taken in conjunction with the other subjective and objective findings aids in arriving at a correct diagnosis. In all cases roentgenographic examination is essential as an aid to diagnosis, and it is a legal safeguard in respect to the permanent recordings of positive, as well as negative, findings.

Treatment

The treatment of low back pain is as protean in its form as the diagnosis is varied. In spondylolisthesis, or in tuberculosis, or rarely in fracture of the vertebrae, fixation may be procured by means of hone grafting operations. In osteo-arthritic conditions of the lumbosacral or sacro-iliac articulations, similar fusion methods may be adopted. In these conditions, however, if the degree of discomfort is not too severe or if it is possible for the patient to lead a less strenuous existence, very satisfactory results may be obtained by supportive appliances such as the arm chair back brace (fig. 4), or Taylor brace or by lumbosacral and sacro-iliac belts with or without pads. If the patient is a woman, eminently satisfactory results may be obtained by the use of reinforced corsets. In the case of spondylitis, an attempt is

first made to correct the deformity or at least to decrease it, by hyperextension on frames or by the application of weight to the head and feet. When deformity is reduced to the greatest extent possible, a brace of the Taylor pattern is fitted accurately and is worn until ankylosis has occurred. In spondylitis as in arthritic conditions of the sacro-iliac articulation, fusion brings relief from pain, but until this occurs, some form of support or splinting to relieve pain and prevent increasing deformity is required. In cases of fracture of the articular facets or protrusion of the intervertebral disk, surgical removal of the fragment or the protruded disk is indicated.

In practice, many backaches with which one has to deal must be classified, in the present state of our knowledge, as idiopathic. In cases in which no discoverable cause can be found to account for the backache, the patients are often greatly improved by being placed in bed with a lumbar sling and with Buck's extension applied to their legs (fig. 5). Patients are requested to coöperate in maintaining the traction although the position is uncomfortable during the first few days. The lumbar sling or the weights, or both, may be left off every few hours if necessary. After three to four days, however, most patients can maintain the posture for many hours without much discomfort. In a fair proportion of cases this method of extension plus routine physical therapy with heat and massage will effect relief in ten to fourteen days. The patients are then dismissed with instructions to continue with treatment at home and to wear a supportive corset or belt as a temporary safeguard against excessive activity, such as stooping and lifting. No doubt some of these patients have had undemonstrable lesions such as inflammations and strains, which are benefited by rest and extension followed by support.

When pain persists or is aggravated by the treatment, epidural injections of procaine have occasionally resulted in a complete disappearance of symptoms and in some cases this has persisted for several years. It might be worthwhile to mention that aggravation of the pain and extension along the sciatic nerve immediately following or during the injection are indications of protrusion of an intervertebral disk. The application of a cast from the axillae to the lower part of the thigh, while the spinal column is hyperextended, has produced excellent results in certain cases. The cast is left on for three to six weeks after which a lumbosacral support is worn and physiotherapeutic treatment given. In other cases massage of the coccygeus and piriformis muscles in combination with rectal application of diathermy, and sitz baths, have produced benefit in cases of coccygodynia. Manipulative measures under anesthesia alone or combined with other methods of treatment have been successful in many cases of persistent painful back. Section of the fascia lata (Ober) has been advocated and has given relief undoubtedly in well selected cases; however, our experience with this form of treatment is too limited to permit of a dogmatic opinion.

By the use of conservative measures, in which are combined the antispasmodic effects of physical therapy and the bracing action of external supports, much benefit will be given to those who suffer from the idiopathic form of backache. The reduction of excessive overweight and the adoption of less arduous activities combined with the improvement of the general physical state by sunbaths, moderate well balanced exercises and good body mechanics will relieve backache in the great majority of cases. We are strongly opposed to the tendency to treat all forms of pain in the lower part of the back by surgical methods without a thorough and sometimes prolonged trial of the less spectacular method of conservative care, and we unhesitatingly condemn the practice of fusion operations in the absence of a demonstrable structural defect.

Diagnosis and Treatment of Eye, Ear, Nose and Throat Conditions of Particular Interest to the General Practitioner*

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IN discussing the diagnosis and treatment of eye, ear, nose and throat conditions which are of particular interest to the general practitioner, I must of necessity refer only to a few conditions, but I will try to cover the most common and important diseases under each classification.

Diseases of the Eye

First, I will discuss the most common of all eye injuries, the foreign body in the cornea, with which every general practitioner is familiar. Perhaps there is no type of case wherein the first treatment is of more importance than in the case of so-called simple foreign body in the cornea. We must remember that practically all serious corneal conditions and infections are the result of minor injuries such as we see every day. The first and most important thing in handling this type of case is the diagnosis, and this requires a good light. Every physician past forty-five should have a presbyopic correction or a magnifying loupe, so that foreign bodies in the cornea will not be missed. It is well to examine the eye first by oblique illumination, using butyn or pontocaine as an anesthetic rather than cocaine, as butyn or pontocaine do not have the injurious effect upon the corneal epithelium that cocaine has. If a foreign body cannot be found, and the patient still complains, it is well to use a drop of fluroscine or mercurochrome, and then flush with boric acid. A small abrasion of the superficial layers of the cornea which gives all the symptoms of a foreign body will often be found. Once the foreign body is removed and the eye cleansed, it is essential that we resort to the old basic surgical principle, rest, and put the eye at rest. This is best done by the use of a fixation bandage for at least twelve hours. Authorities disagree upon this point. Some advocate sending the patient out with holocaine, or other anesthetic drops, but I believe that this is poor treatment. Too much emphasis cannot be laid on the proper early handling of these simple injuries of the cornea, as the poor and improper care of these cases leads, not only to impaired vision due to leukomas or scars of the cornea, but in many cases to the loss of an eye.

Another type of case which the general practitioner frequently sees is the inflamed eye. It is very necessary to recognize at the beginning that the red eye may be due to several conditions. Some are simple and superficial, and others are of a more serious nature. The first thing one thinks of is a conjunctivitis. We must differentiate between the different types. I might say that one of the most common forms of conjunctivitis in North Dakota is that caused by the Morax-Axenfeld bacillus, and is the one most commonly overlooked by the general practitioner. This condition has outstanding characteristics, and once seen, will never again be missed, as there is no ciliary congestion, and very little congestion of the orbital conjunctiva, but both the angles of the lid, especially the outer angle, show from a slight to a great amount of secretion and the skin is excoriated. These conditions treated by the ordinary method of silver salts will grow steadily worse, but if they are treated with 1 per cent zinc sulphate, they will clear up over night.

Another diagnosis that is frequently mistaken in the inflamed eye is that of iritis. This is characterized by a scanty secretion, or none at all, and the eye is tender to the touch, with marked ciliary congestion. You will find the pupil contracted and it will react poorly, or not at all to light. The iris may be only slightly discolored in the early stages. Many eyes have been lost because this condition has not been recognized, and the eye has been treated for conjunctivitis with silver salts until the iris has become adherent to the lens capsule, and the pupil covered with an organized exudate. Then it takes a very strenuous treatment to break down the synechia, which is the first thing which must be done. This is best done by sweats, atropine, hot applications to the eye, and the use of foreign proteins; and in the majority of cases, large doses of salicylates.

Glaucoma is primarily a disease of older people, and can be roughly classified into two groups, inflammatory and non-inflammatory. The non-inflammatory type is a most insidious disease, and frequently the cause of almost total loss of vision, because the disease is not recognized in its early stages. The patients do not complain of pain. The usual complaint is loss of vision, and they frequently give a history that they have had their glasses changed about every six months for the past two or three years, with no marked improvement, in fact, the condition has grown steadily worse. We usually find that they have perfect visual acuity directly in front, but the fields are contracted until they have practically nothing but tubular vision. The early recognition of this disease is very necessary, for in the majority of cases it can be treated medically in the early stages, but when it reaches the stage of tubular vision, so much damage has been done to the nerve that nothing can be done.

Inflammatory glaucoma, on the other hand, can be easily recognized, for the patient complains of great pain, especially at night, radiating back to the temples, dimness of vision often due to the steaminess of the cornea, and the pupil is dilated.

*Read before the meeting of the North Dakota State Medical Association, May 9 1939.

I mention the diagnosis and treatment of cross eyes only to call attention to the present status of the treatment of this condition. In many cases, if the patient is seen early enough and given proper refraction and correction, and a program of exercises (occlusion), the eye may become normal, not only from a cosmetic standpoint, but it may also retain normal vision. The old theory is still held by some men (and the parents are so advised) that nothing can be done until the child is 10 or 12 years old, and then the eye can be corrected by surgery. This is very poor advice, and only a half truth. Of course, the eye can be straightened, but instead of operating upon an eye which has normal vision, we are working on an eye which has become blind from disuse. I might say that contrary to the usual belief held by the laity, cross eyes are not caused by measles, or other diseases of childhood. The basic cause is usually a difference in refraction in the two eyes—lack of fusion—and usually shows up at about the age of six weeks to six months, when the child begins to notice the fingers, et cetera.

The question of fitting glasses is greatly misunderstood by the general practitioner. There are many regular medical practitioners who refer their refractions to an optometrist, a man wholly ignorant of the diseases of the eye, and in many cases, (and I have definite proof of this statement), not absolutely honest with their clients. They usually try to live up to their full title of "Doctor" by giving advice, not only about glasses, but also about other eye conditions of which they know nothing, and for which their training and preparation has in no way fitted them. In the past two years, six patients have come to our office after having had glasses fitted recently by optometrists, and been told that they could not get normal vision due to the fact that they had cataracts on one or both eyes. In all six cases, we found a sarcoma of the choroid, the early treatment of which is very necessary, and where delay means hazardous results. These poorly trained men also attempt to treat children's eyes, of course, without drops. Under present economic conditions, large numbers of children with progressive myopia and other eye diseases are being treated by optometrists. They should have treatment by competent medical men who can give them the proper correction and general hygienic advice, which only physicians can give them.

FUNDI: Examination with the ophthalmoscope.

The study of the changes in fundi in cardiovascular disease is of unique interest and importance from both a diagnostic and prognostic standpoint because with the ophthalmoscope, which magnifies fourteen times, it is possible to observe in the living patient, the blood vessels of the retina. Ophthalmoscopic changes may be divided into three major headings: edema, exudates, and hemorrhages.

Cardiovascular Disease. Our present knowledge of the etiology of cardiovascular disease is very limited, but it is clear that it first manifests itself as a pure vasospasm, followed by organic changes in the vessel wells, and the following conditions become apparent: (a) The veins show engorgement and tortuosity. (b) The arteries become narrower and take on a lighter color, and the central light stripping becomes more distinct. The pulsating arteries of the retina seen with the ophthalmoscope, are always pathological. (c) Crossing phenomena. The veins show a constriction where they are crossed by an artery. (d) Edema of the retina is often noted as well as edema of the optic nerve. (f) Small hemorrhages are present along the course of the blood vessels.

Renal Disease. Most authorities claim that retinal changes are not found in renal disease unless hypertension is, or has been present. The following points are to be noted: (a) Earliest retinal changes are in the arterioles, especially in the macular region. (b) Star-shaped white spots are seen around the macula. (c) Hemorrhages are nearly always present. (d) The veins are swollen and tortuous. (e) The arteries show increased stripping but the caliber is not altered. (d) When the retina becomes involved in renal disease, the prognosis is bad—the patient usually dies within two years.

Papilledema (Choked Disc) and Papillitis. It is very difficult to make a differential diagnosis between these two conditions in the early stages. If the swelling of the disc is two diopters or less, it is generally considered an intraocular neuritis (papillitis). If the swelling is over two diopters, even as great as ten diopters, it is considered a papilledema or choked disc. In papillitis there is always a post-neuritic atrophy following the acute attack. There is usually no excavation at the nerve head, as it is filled in with inflammatory exudate and the edges of the disc are always blurred. On the other hand in a papilledema or choked disc, the swelling is anywhere from two to ten diopters. It may be present for months without diminution of vision and is usually bilateral. Many times the condition is more advanced on one side than the other, but this is of no particular value in locating a brain tumor causing the edema. The latter condition is invariably found in brain tumors and other cases of increased intracranial pressure, as the intravaginal spaces of the optic nerve are in direct communication with the subarachnoid space of the brain.

Although in the majority of cases the differential diagnosis can be made at times by the ophthalmoscope examination alone, it takes other tests to arrive at a correct differential diagnosis.

Pregnancy. If retinitis is associated with pregnancy and the patient has nephritis, it is not serious and the prognosis is good, as the retinitis is the result of severe toxemia. Sudden blindness in pregnancy is the result of toxemia which affects the cortex of the brain. If we find that the pupils remain normal in their reactions, the blindness seldom lasts over twelve hours.

Diabetic Retinitis. Diabetic retinitis is not a very definite clinical entity. It is found only in elderly individuals and is always associated with hypertension. The retinal changes are often the result of the hypertension rather than of the diabetes. These retinal changes are never seen in young diabetics.

Lipemia Retinitis (a rare type). In this disease the retinal blood vessels are of a pinkish or creamy white

color, due to the high fat content of the blood. Hemorrhages and exudate are never present. The normal color returns with the reduction of the blood fat.

Diseases of the Ear

Acute otitis is the most common ear condition and one which the general practitioner usually sees first. The proper handling of this condition means not only great relief to the patient, but also will avoid many complications which are very apt to occur.

The treatment depends on the condition of the drum membrane. If it is moderately congested with no bulging, the child should be put to bed in a room with 68 to 70 degrees temperature, and the air moistened with medicated steam. Antiseptic, hygroscopic drops should be used every two hours, dry heat to the affected ear, and the usual medication of diaphoretics given. But, if on the first examination the drum membrane is congested and bulging, a paracentesis should be done at once to permit free drainage, which should be followed by the above-outlined treatment.

A treatment, which I mention only to condemn, is the use of a syringe in cases of acute otitis. This will lead to many disastrous results. Principally it will prolong the drainage and an acute otitis media will often become a chronic condition.

Ear conditions which are the result of bathing can be classified under four headings: (1) Dermatitis or infection of the lining of the external meatus, the result of polluted water. (2) Injuries of the membrana tympani by the impact of the water against the drum membrane producing an inflammation of the drum. (3) Furunculosis of the external meatus, the result of abrasion in attempt to remove water, followed by infection caused by polluted water. (4) Otitis media, the result of water getting back through the eustachian tube while diving, and infecting the middle ear. All of these conditions can be avoided if proper instruction is given the patient.

There is another question I should like to discuss. When should a mastoidectomy be performed? The old teaching was to do a mastoidectomy early in an acute case to prevent serious complications, such as lateral sinus thrombosis, brain abscess, and blood stream infection. The textbooks give the outstanding indication for mastoidectomy as tenderness over the mastoid, but we must remember that the mastoid, antrum, and cells are in direct communication with the middle ear, and when the lining membrane of the middle ear is inflamed, the cells of the mastoid (in the majority of cases) are also congested, giving rise to tenderness. The X-ray examination often shows cloudiness, but I do not believe that it is good treatment to do a mastoidectomy, except in very, very rare cases, sooner than ten days or two weeks after the onset of the acute otitis. I believe that many of the complications following mastoid surgery are the result of too early surgical intervention, for nature has not had a chance to throw up her barrier against the spread of the infection. The temperature curve is of some assistance, but the bacteriological examination of the secretions will give more information as to the prognosis in acute otitis media than any other one thing. If you find the pneumococcus predominating, or as we used to call it, the capsulated streptococci (streptococci mucosa), you are apt to find involvement of the bone, and a fairly early operation (surgery after two weeks) is indicated. The temperature in these cases is of no practical help, as in many cases of pneumococcal infection of the bone, the temperature will be normal, or nearly normal, and the white blood count will not be particularly elevated. One symptom or sign that will invariably point to the necessity for surgery is that the patient persistently complains of a pain in half the head, or a half-headache. If the discharge is present after three weeks, if there is sagging of the posterior-superior wall, and the X-ray examination shows breaking down of the septa (not just cloudiness of the cells), then there is definite indication for surgical intervention. We must remember that some of our most serious mastoid infections requiring surgical interference, do not have the classical signs of the disease, that is, tenderness and swelling over the mastoid process. In small children under three months old, a mastoidectomy is very seldom necessary for very few mastoid cells have developed at this age. If an operation is indicated, nothing but an antrotomy is indicated.

Hearing defects in people past middle age are very common complaints, and it is very necessary to ascertain if the defects are due to catarrhal conditions or nerve involvement. This can be ascertained very easily with a tuning fork. When younger people complain of repeated attacks of temporary deafness, it is well to make a thorough examination of the upper respiratory tract, especially the nasal cavity and post-nasal space, to determine if there is any pathology present. If there is, it cannot help leading to difficulty in hearing later in life unless the trouble is cared for.

Diseases of the Nose and Throat

Does the size of the tonsil always determine the need for operation? Should a large tonsil always be removed? We should go into these cases very thoroughly to decide whether the symptoms complained of can honestly be laid at the door of the enlarged tonsils. If the tonsils are not giving any trouble, if the patient does not complain of frequent sore throat, and if the tonsils are not obstructing the breathing, I do not see any good reason for their removal. However, if the enlarged tonsils, together with large adenoid pads in the post-nasal space, are causing repeated sore throat, which often leads to infection of the ears, then there is no question as to the necessity for surgery. When surgery is done, it should be done thoroughly. The tonsils should be completely removed in capsule, together with the plica triangularis, which in the majority of cases contains large lymphoid nodules. This is particularly true when we are looking for a source of focal infection, for the latter is very often the cause. I do not know of any operation that gives more striking relief than the removal of large adenoids, but at the same time, a poor adenoidectomy will often lead to serious complications later. I do not think that an adenotome should ever be

used for anything but removing the large central pad of adenoids. The adenoid tissue located laterally in the fossa of Rosenmüller should never be removed with an instrument, but preferably with the finger and gauze, for we all have seen many eustachian cushions injured and often removed at the time of an adenoidectomy, which later leads to obstruction of the eustachian tube resulting in impairment of hearing.

Nose-bleed. Although nose-bleed is not often dangerous, it may be very troublesome. The most common site of bleeding is Kiesselbach's area at the lower anterior part of the septum. This is true especially in younger people, and can usually be checked by slight pressure over Kiesselbach's area at the site of the bleeding. It may require trichloracetic acid, but the most satisfactory method of stopping the bleeding, particularly if there are one or two vessels involved, is by the use of diathermy. Bleeding following injury is seldom serious, as it usually stops spontaneously.

Sinusitis. Sinusitis is a disease much in evidence in medical literature and in lay literature of the present time. In no branch of surgery has more unnecessary and traumatic surgery been done than in the nasal cavity and the adjacent sinuses. We must remember that the nasal mucous membrane is a very important structure, and must be conserved. When patients complain of obstructed nasal breathing and that first one side, then the other becomes obstructed, we invariably find a marked deviation of the nasal septum, resulting in hypertrophic rhinitis. The operation of choice in this case is a submucous resection. The obstruction is thereby removed, and no mucous membrane is sacrificed.

The hypertrophic condition of the nares is usually the cause of acute sinusitis and should have attention. All cases of acute sinusitis are not surgical and the majority are handled by conservative and non-surgical methods. If there is an accumulation and a retention of septic material in the antrum, sphenoid, ethmoid, or frontal, it is important that free drainage be established, although the method of establishing the drainage varies in the hands of different men and in different parts of the country. In the south and along the Atlantic seaboard, we note a great number of radical operations, but I think the pendulum is swinging to more conservative measures, and only in extreme cases is it advisable to do a radical on the sinus, such as a Cardwell-Luc or a radical frontal operation. In diagnosing sinus diseases, great importance has been given transillumination, but I do not think one should depend too much upon dark transillumination of either antrums or frontals. A cloudiness confirmed by X-ray will usually give conclusive evidence. The use of lipiodol by the displacement method is of great assistance in diagnosing doubtful cases.

The treatment of polypi is considered by many a very simple procedure, but we must remember that polypi are just the external evidence of disease of the ethmoid cells, and a simple removal of the polypi will give only temporary relief. The ethmoid labyrinth should be thoroughly cleaned and all diseased cells removed for permanent relief. Even with the use of the most radical procedure, there is a tendency toward recurrence. The use of radium in these cases has been found very helpful.

In treating an infected antrum of dental origin, the old treatment of drainage through the tooth canal is mentioned only to be condemned. If a dental accident occurs, and an opening is made into the antrum, which is apt to occur if there is a diseased tooth or apical abscess near the floor of the antrum, the first step is to close the oral opening and get drainage through the nasal cavity. We must remember that the nasal mucous membrane and the mucous membrane lining the antrum is not suited to the care of the bacterial flora of the gastro-intestinal tract.

Endoscopy

The question of endoscopy is a live subject today and of interest to the general practitioner as well as to the specialist, for in most cases, the general physician sees the patient first. Endoscopy can be of great assistance to the general practitioner in helping to diagnose obscure chest conditions and also in bronchoscopic drainage of bronchiectasis. The latter is a debatable question. Just how much permanent good is done by bronchoscopic drainage is questionable, but there is no question about the relief given the patient, and in many cases it affects a permanent cure.

In primary carcinoma of the bronchi, the bronchoscope is of inestimable value in making a diagnosis.

It is only in the last thirty years that much importance has been given to the aspiration of foreign bodies into the upper air passages, and the many types of chest conditions which they may produce. If a foreign body has been aspirated or swallowed, the symptoms are usually definite and their presence can be very definitely localized if they are opaque. If they are non-opaque, much information can be obtained by thorough roentgenographic study. Many cases of so-called pneumonia in children are due to unsuspected foreign bodies present in the bronchi, producing a drowned lung, which presents almost all the physical symptoms of lobar pneumonia.

If a pin or other metallic foreign body is swallowed by a child and is lodged in the esophagus, it should be removed at the earliest possible time to avoid complications. Once the metallic foreign body has reached the stomach, there are certain rules that must be very definitely kept in mind. It can be watched without danger to the patient and if it passes the pyloris, in most cases it will be eliminated in the natural way. However, the foreign body must be carefully watched because we know that pins, needles, et cetera, do not perforate the bowel in passage. It is only when they become lodged that they set up a reaction which causes a perforation at the point of contact. The safe rule to follow is to watch the foreign body daily with a fluoroscope. If it changes position, it is perfectly safe to leave it, but if it remains stationary for two or three days, surgical intervention is imperative. General care of these patients should also be observed. There should be practically no change in diet and under no circumstances should a

cathartic be given. Some authorities advise feeding small bits of absorbent cotton mixed with cereal in the hope of entangling the point of the pin and thus protecting the walls of the intestine, but I do not believe that this is necessary.

I want to stress the importance and value of direct laryngoscopy in children. I believe that every general practitioner should have a small laryngoscope if he is called upon to treat any children. If there is an obstruction of the larynx, it is practically impossible to make a thorough examination of the larynx by the indirect method in infants. With direct laryngoscopy, the larynx can be exposed very easily and foreign bodies, acute edema, or membrane in the larynx can be seen. Often in cases of laryngeal diphtheria, the laryngeal symptoms are the only ones present. I cannot stress too much the value and importance of direct laryngoscopy in diagnosing diseases of the larynx in children.

A Quarter of a Century of Health Work in the University of California Health Service*

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A YEAR ago having reached the age of retirement as an administrative officer, I was relieved of my duties as director of the E. V. Cowell Memorial Hospital and Health Service at the University of California where I served for a quarter of a century. It was an abundant life; one filled with experiences in organization, administration and personal professional services to many thousands of students.

Preamble

For fifteen years before entering university health work, I was chief surgeon of a large industrial plant in a one man's town where I became interested in preventive surgery and medicine, sociology and community health. Being director of the hospital, clinic and health officer of the community, I had the opportunity to control morbidity by public health measures, safety and curative medicine. The important service depended largely on the organization of a modern, well equipped dispensary in a first class hospital, in which employees were encouraged to seek early treatment, and where they could secure medical examinations. It was in such a center that emphasis was placed on developing health education and a community spirit in regard to sanitation and accident prevention. Definitely, and by statistical means I can demonstrate that in this pioneer venture communicable disease was controlled, morbidity, accidents and mortality minimized, likewise absenteeism, turnover and compensation. It was due to this achievement that President Benjamin I. Wheeler in 1914 invited me to become Professor of Hygiene and University Physician, an honor I cherished greatly as it came as a complete surprise and unsolicited. My predecessor, Dr. George H. Reinhardt, had unfortunately died. It was he who in 1906, the year of the great San Francisco fire and earthquake, was inspired to organize the pioneer university infirmary-health service in one unit on the campus of the University of California. This inspiration was largely due to the lack of surgical facilities, and the foolish refusal of hospitals to admit contagious diseases. Being a medical man and an instructor in physical education, he recognized that physical education was only a minor factor in preventive and curative medicine. Furthermore the control of communicable disease, the need of acute surgery, the understanding of medical examinations and immunity procedures, necessitated such a medical center. His first obstacles came from the faculty, who complained that such an adventure was non-academic, and from the medical profession, who denounced it as socialized medicine.

Aims and Objectives

The main objectives were to combine and intelligently practice preventive and curative medicine, specifically for the control of disease and the safety of the registered students within the confines of the campus; to perfect a complete medical record by means of a thorough physical examination to be held and registered as a living picture of each student; and to erect and administer a health service and hospital under one roof, as a center which any student without economic consideration could enter freely and receive medical and hygienic advice and care by sympathetic medical specialists. In this manner the staff would be able to observe early signs of disease before pathology advanced. This is a real contribution to curing and preventing serious morbidity or mortality. Only by such means is it possible to improve and treat the physical and mental health of students, prevent disease by scientific public health measures and offer an opportunity to students to witness the practice of scientific medicine.

Further, the educational value of consulting their regular physicians early and becoming interested in health problems is of great importance to the students, as it affects their attitude in the future.

These were my aims and objectives, and the inspiration was in the right direction. So that today the Stu-

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dent Health service of the University of California stands out as a monument and a contribution in the field of educational health practice. I am satisfied that this pioneer contribution has constituted a factor in the phenomenal growth of our university, and, it is also safe to state, has increased scholarship efficiency. The hundreds of letters received from grateful parents residing in distant places, indicate the appreciation of the university's responsibility in the care of their sons and daughters when ill and while living away from home. The students depend upon and praise the service and the faculty; and outside professions also have the utmost confidence in the institution.

March of Time

During the Spring semester of 1915 a new health record system was introduced. Chapin's methods of control of infectious diseases, and advancements in operative surgery were instituted and a dental department organized. Venereal diseases were accepted and treated, the same as any other of the infectious diseases. Health education and coöperation with the various administrative and academic departments were initiated; a splendid relationship created with the outside medical profession and various health agencies in states; all of these constituting one of the crowning events of the administration.

The selection of a medical staff is the keystone of a successful medical organization. We not only investigate his qualifications but select a person who is respected in his field of medicine by the profession and the societies he is affiliated with, it being an honor to become a member of the staff.

The Great War came, and the Infirmary became the Post hospital, with the University Physician, who was a commissioned officer in the Medical Corps its Post surgeon. The organization of the medical service of the Students' Army Corps, the enlisting of contract surgeons, the quarantining of sick soldiers and the medical examination and immunization of the draftees were achieved through the efforts and initiative of the Post surgeon. The great influenza epidemic in which 1,400 soldiers on our campus were seriously ill, was cared for according to plans he organized and prepared when the disease was reported as the first cases entered Boston harbor. As a result only 13 soldiers perished; the lowest mortality of any army post in the country.

After the war, as the University population increased, it was recognized that more well trained specialists were essential for the successful maintenance of such an organization of group medicine, and for improved diagnosis and technical treatment. Many specialties were therefore added to the Health Service, headed by men eminent in their profession, viz.: orthopedic surgery, dermatology, mental hygiene, ophthalmology, roentgenology, urology, neurosurgery, pathology and allergy.

The different technical departments such as X-ray, clinical laboratory, allergy and physiotherapeutics, were organized on a high scientific basis. Dietetics and nursing were standardized according to American Hospital Association requirements.

For several years attempts were made to organize and place the medical care of organized athletics under the supervision of the University Physician, and during President Campbell's administration this was finally consummated. As a result, our system of medical care of athletes is one of the foremost in the United States. Athletic injuries and diseases have markedly decreased, and likewise there has been a lessening of cripples and of mortality in general.

The crowning event of my life's work was the planning and building of the Ernest V. Cowell Memorial Hospital which was completed in 1930. This fine fireproof edifice, perfected for the care and treatment of all kinds of human ailments, with its splendid administrative department, well equipped dispensary office and laboratories, dental and operating rooms and hospital departments, organized with a highly trained personnel of medical specialists, graduate nurses, technicians and clerks, comprises the outstanding student health service in the world. It is the first student hospital which was standardized and approved by the American College of Surgeons.

Successful Administration or Accomplishments

I have contended that the dispensary is the backbone of the health service, which must be free and inviting; where students can seek advice and treatment for illnesses in the earliest stages, before pathology ensues. This is the period when curative medicine offers utmost values, and where preventive medicine controls grave morbidity. We have made it a practice that any patient entering the dispensary with one degree centigrade temperature must be seen and examined by a physician and ordered to bed for isolation and treatment. How frequently we would find the next morning a rash or other signs of an infectious disease present. Here we saved twelve hours of possible disease contagion, and reaped the earliest opportunity to investigate epidemiologically the student's contacts.

Every student upon registration is compelled to have a complete physical examination administered by specialists, which includes eye, ear, nose and throat, dental, X-ray of the chest when intra-dermal tuberculin tests are positive, a psychiatric questionnaire which is recorded, vaccination for cow-pox, urine examination and Wassermann test (not compulsory). Our records are more extensive than the U. S. Army or life insurance examinations. This record is consulted every time a student applies for service. On the reverse side it is dated, and a notation is made for follow-up, care, correction, diagnosis, treatment and other types of service. Our record as to the physical examination is used for the R.O.T.C., athletic and physical education departments.

Our practice was never to use our clinical material for experimentation; this prevents any criticism from any source. Only remedies for known specific diseases were prescribed. Group practice and consultation by the specialists on the staff were in order whenever required. Unlimited free laboratory examinations, X-ray, electrocardiograms, allergy tests and immunity procedures were placed at the command of the physicians. All traumatic

and acute surgery arising while in residence is offered without cost. The only charges for students are made for special apparatus, certain biologics and glasses. Dentistry is offered at a small fee of two dollars per hour.

A health examination is available to students whenever requested. Special examinations for all students entering athletics or physical education, for entrance to the professional schools, the army and navy, and for food handlers employed on the campus are provided; also supervision of athletics, follow-up care and hospitalization whenever necessary.

Pathological conditions pre-existing entrance to the University are not treated except when these conditions keep the student from studying and can be ameliorated consistently with the student's return to class work during the current semester.

Registrations and Costs

During this academic year 1938-39 there were registered 17,285 students on the Berkeley campus entitled to Health service privileges. Of this number 14,462 individual students, or 83 per cent, availed themselves of this service, for an average of 9.7 times each. Out of this number 1,973, or 11 per cent, were hospitalized for a total of 16,152 days, a daily average of 56. The greatest number on any day being 110, and the largest number of ambulatory patients treated in the dispensary was 1,066, averaging 560 per academic year.

The cost of the student's Health Service from July 1, 1937 to 1938 was $164,000, and for 1938 and 1939 was $198,000, an increase of 20 per cent in expenditure over the previous year. This was due to an increase of 217 students requiring hospitalization and 2,377 increased number of dispensary patients, to the Wassermann tests, and incidental administrative costs, to an increased registration of 1,086 more students than the year before, and to additions to the staff, and the abolishing of surgical fees. Prior to 1938-39 a minimum fee was charged for major surgery; the revenue collected was returned to the University budget and not added to our own budget. Now all acute surgery necessary during the residence of the registered student is performed without cost—dentistry excepted. The present cost per student which is collected from the incidental fee is $11.65 per academic year or $5.82 per semester. The 16,152 hospital days costs the Health Service $5.24 per diem.

Activities

Some twenty years ago it was estimated in a survey of the American Student Health Association that the hospital bed patient incidence was 1 per cent of the registered student body where a health service was established. At the Cowell Memorial Hospital for this academic year the average percentage was ½ of 1 per cent in a non-pandemic period.

In the registrated areas of the United States the mortality rate of the age group between 16 and 24 years of age, comparable to the ages of our university students, is three per thousand annually. During the year 1937-38 there were chronicled five deaths among the student body of 16,199, with no deaths in the hospital or on the campus, definitely showing that the system of preventive and curative medicine intelligently practiced has lessened the death rate to 10 per cent of that in the registrated areas. It may be inferred that our students are in a special class, and not subject to influences that are found among the public rank and file. Yet at Davis, University of California Agricultural College, with an enrollment of 1,196 students for the corresponding year, the mortality was four students or .04 per cent higher than the registrated area of the United States.

Major Surgery. Appendicitis leads the list of acute abdominal operations, averaging 37 cases annually since 1914, the rate being about 3.4 appendectomies annually per 1,000 student population during the past 24 years. In 1938-39 there were 113 appendectomies. In this period surgical fees for acute surgery which occurred while the student was in residence, have been abolished. Our mortality rate at corresponding ages was .02 per 1,000 individuals as compared with general non-student population, which is approximately .13 deaths per 1,000, six times greater than our rate.

The reason for our excellent results is that medical service and prompt diagnosis and operation, plus the health education program which informs the student that any stomach-ache requires a physicians opinion, and not cathartics or sedatives.

Tuberculosis. During the past year 7,535 individuals were given tuberculin tests: Of this number 23 were sent to sanatoria with early active tuberculosis, and all contacts were examined and followed. Those students with quiescent or arrested tuberculosis are under constant observation, and are followed regularly. As a public health measure it is advisable that all known infected faculty members, administrative and other employees officially engaged on the campus should be reported to and checked by the University Physician.

Syphilis. The Health Service in making physical examinations have in the past kept in mind any suspicious symptom that might possibly be related to this disease, and such patients were given complement fixation blood tests. In 1932 the University of Minnesota gave 5,000 students Wassermann tests with an incidence of ten positives. At California in 1934-35, 383 students who exhibited some possible sign which might indicate a suspicion of syphilis were examined at the Health Service and were serologically tested with six positives. In 1938-39, in keeping with the National Public Health program, 4,839 students on entering received Wassermann tests (not compulsory) and seven were found positive, four being unaware of it—probably congenital cases. This definitely proves that the incidence of this disease among college students is practically nil. The cost was $911 or .18 cents per student for equipment and material. As the active cases are usually discovered, there is a question as to whether or not these efforts are worth while. We have a special venereal clinic, well equipped, with two attending urologists. The service is free and confidential; the student is not penalized as the purpose is to treat the disease early, and control the same in the interest of public health. The number of Neisser infec-

tions is about 1/10 of 1 per cent of the student enrollment.

Mental Hygiene. The University of California pioneered in the inclusion of mental hygiene in a student's Health Service. We have two psychiatrists on the staff, who have classified student disorders predominantly as primary behavior conditions, i. e. personal inefficiencies and psycho-neurotic reactions. It is of interest to learn that 50 per cent of these cases were referred by the Health Service physicians, 10 per cent by the Faculty and Deans, 20 per cent from the Mental Hygiene questionnaire, and the balance by students who sought aid on their own initiative.

The President's Student Health and Welfare Committee has recently recommended that a trained social worker be employed to act as a liaison office for the administrative officers at California Hall, and for the Health Service; an advancement for the study, correction and follow-up of mental and other social health problems.

Campus Sanitation — Disasters

The University Physician is responsible for the sanitation of the Campus. A trained health officer has been added to the staff, and a sanitary code has been prepared outlining such activities as food establishments, swimming pools, wastes, buildings and grounds, plumbing, etc.

A disaster program in event of epidemics, panics, fires and earthquakes has been provided, so as to meet any possible situation at a moment's notice.

The President has also appointed a safety committee to survey and provide safeguards and accident prevention on the grounds, laboratories and shops for students and employees.

Staff

The Health Service and Cowell Memorial Hospital 1938-39 staff consists of 151 individuals, this group including 47 physicians, 36 nurses, 15 technicians, 7 dentists and 46 clinical and other attendants.

Research

Many problems pertaining to student health have been conducted by the University Physician and members of his staff. In the past researches on epidermo-mycosis, plantar warts, on relapsing fever, which ultimately discovered the vector carrier, smallpox vaccination, significance of traces of albumin in urine, poison oak, etc.

At present, certain investigations are in progress, viz.: in Schuerman's Disease, a congenital defect of the vertebra; measures to correct the clicking and sliding of the tempero-maxillary joint that may arise from the third molar and its bearing on occlusion; and a study on idiopathic epilepsy, by certain approaches that have been advanced in experimental therapy.

Conclusions

In my experiences of forty years of health work among industrial workers and college students, I have found that success can only be attained whether in a small college or a large university, by combining curative and preventive medicine.

To practice curative medicine a well organized health center is essential, to which students will be attracted, and confidence in the administration can be achieved, so that they will seek advice and welcome laboratory procedure. Above all, they must be taught to seek early consultations and treatment for minor illnesses while they are curable and before grave pathology ensues. All these procedures are to be gradually augmented by the application of epidemiology in the control and prevention of communicable diseases, by immunity procedures, sanitation and health education; and to develop safety measures for the prevention of accidents.

The ultimate aim of a successful college physician must be to constantly better any standards that may be set up as an optimum, as for example, the reduction of the mortality rate among college students.

The
JOURNAL LANCET

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The Official Journal of the

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American Student Health Ass'n
North Dakota State Medical Ass'n
South Dakota State Medical Ass'n
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W. A. Jones, M.D., 1859-1931

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CHILD PSYCHIATRY

Child psychiatry is a recent development in the sphere of medical practice, created with the goal of inaugurating a program of prevention against mental illness. It has long been recognized that the psychoneuroses and psychoses of adult years, instead of being sudden changes, usually follow a long period of maladjustment and increasing social and mental inadequacy. Persistent feeding problems, food fads, and temper tantrums occurring in the pre-school and pre-adolescent periods may easily become the basis of the vague systemic complaints for which no satisfactory organic pathology can be found. Complaints of ill health arousing parental anxiety and permitting escape from unpleasant tasks often afford an easy channel to avoid difficult situations. The child who has encountered prolonged illness has a natural resistance against giving up the concessions of convalescence. Fear that overactivity may cause recurrence often follows well-intentioned prohibitions imposed by the physician. Poorly planned training programs, oversolicitude and overanxiety by parents often give rise to feelings of inadequacy and frustration in the child. Educational handicaps, such as inability to learn to read but normal capacity to absorb other subjects, lead to many emotional conflicts.

The high incidence of school retardation encountered in juvenile delinquents strengthens the contention that regimentation often existing in our school systems may easily become a contributing factor to our high delinquency rate. Discouragement in school invokes restlessness and truancy, ofttimes the first step in anti-social behavior. From these sources, and many others, the emotional and social maladjustments of youth develop that seriously hamper the future usefulness and happiness of the individual.

The busy physician whose services are sought only in times of emergency is prone to fall into the habit of treating symptoms rather than the child as an individual. Unduly prolonged physical complaints, lacking demonstrable physical findings, should serve as an indicator that thought and attention must be directed toward the investigation of personality factors of the child and those

who surround him. The majority of these maladjustments will respond satisfactorily under the care of the family physician who is willing and interested in taking the time to see the total picture. The underlying causes of antisocial conduct, such as lying, stealing and incorrigibility, have attracted singularly little attention from the medical man. He has been content to leave the full responsibility to the teacher, the judge of the juvenile court, the probation officer and the social worker. Yet, the family physician is frequently more strategically placed to offer guidance and leadership to the child and his family.

The psychiatrist trained in the management of problems arising in childhood is prepared to undertake the complete, intensive investigation of those cases so time-consuming and complicated as to be beyond the sphere of the general physician. In the child guidance clinic, the full resource of exploration of physical condition, intellectual capacity, emotional integration and environment can be undertaken. Although the number of child guidance centres is rapidly increasing, their facilities are still limited to a small number of the more severe cases. At present these centres can best serve as educational units to the general practitioners. The responsibility for prevention in mental hygiene lies, and will always lie, with the general practitioner and the pediatrist.

This issue of the Journal-Lancet has been prepared to illustrate the various facets of child psychiatry, with practical suggestions for meeting them when they are encountered. The hope is to bring before the medical profession ways and means of being more effective conservators of mental health.

Eric Kent Clarke

PSYCHOSOMATIC MEDICINE

There has been an increasing interest in the relationship between emotional factors and organic disease which has culminated in a new branch of medicine known as "Psychosomatic Medicine." A publication by this name has recently appeared. Its articles and monographs are enlightening and are concerned with aspects of medicine which were poorly understood until recent years.

The inter-relationship between emotional factors and somatic structure was demonstrated by Freud early, in the conversion symptoms of hysteria. There has not been a great deal of resistance against accepting the fact that mucous colitis and asthma have emotional components. The more recent work which has demonstrated that gastric ulcer, hypertension, many skin conditions and other allergic manifestations may be a result of emotional conflict, will meet with less resistance when the research of the editors of Psychosomatic Medicine is carefully analyzed.

One of their major contributions is the demonstration of the role played by emotional factors, especially anxiety, on the course taken by organic illnesses such as cardiac disease and tuberculosis. The ability to relax and obtain the needed rest; to accept dietary restrictions; to accept surgery—depends to a great extent on the personality and emotional adjustment of the individual.

St. Louis University has installed the first department devoted to this branch of medicine and has appointed Dr. Felix Deutsch as the head of this Department. The Chicago Psychoanalytic Society, headed by Dr. Franz Alexander, has been doing research in this field for several years.

Appreciation of this relationship should help to change our attitude towards the neurotic individual with hysterical symptoms. When we find such symptoms we shall be prepared to search for the emotional factors responsible for the suffering.

H. S. Lippman

STRUGGLE OR EASE

When death threatens, life becomes more precious—not because it is threatened but because we are suddenly awakened to a realization of its worth and the meaning of its loss. In like manner, when that which we have been accustomed to look upon as secure, stable, and unchanging begins to crumble, we are prone to lose our poise and become fearsome.

Little wonder then that the economic jolt suffered by many during the past decade has led to a lot of loose talk and a one-sided attitude toward life. We have heard so much about social, economic, and old-age security—security against want and security against aggression and war—that we have come to expect security against the need of struggling for anything. We must realize that only in a relative sense is it good to have security. Complete protection against every form of inconvenience begets a dull, lazy, and cowardly life. Huxley says, "Life is a compromise with conditions as we find them." A certain amount of insecurity, therefore, is a good thing. In the past, it has been one of the most stimulating factors in the progress of mankind, and life would be quite colorless without it.

Physicians do subscribe to the doctrine that the strong should look after the weak, the sick, and the needy. There is nothing new about that to them; they have incorporated it in their principles of medical ethics. The danger, then, is not so much that the helpless will be neglected but rather that this widespread preachment about security will disseminate a blight of fear among the able-bodied men of our population. They should not be intimidated to the point where they will be afraid to venture outside of certain spheres of security to exercise that God-given privilege of daring initiative that has built this land and been the very basis of our present capacity in caring for those whose security is in jeopardy.

A. E. H.

THE SOCIETY FOR RESEARCH ON CONVULSIVE DISORDERS

The practice of medicine has changed greatly in the past quarter century as the results of medical research have become applicable to the therapeutic management of the patient. Scientists have been reaching out in their investigations, for it is realized that disease entities are often not clear-cut and isolated. Investigations in one field have frequently resulted in treatment procedures in other diseases whose connection with the original goal seemed remote.

Convulsive disorders have long been a mystery to medical science. Because the seizures are terrifying and arouse abhorrence, epilepsy has become secreted in the dark closets of those unfortunate families where it has occurred. Tradition has flung the cloak of tainted heredity about it.

Recent research indicates that convulsions may result from many causes. The prevalent confusion often leads to the emphasis of treatment being directed toward the control of symptoms with little effort toward establishing the underlying pathology.

For some years the International League Against Epilepsy has been active in encouraging research, which in the United States has been undertaken chiefly in the East. Recently a group of influential people throughout the West became interested in promoting research directed toward the discovery of the underlying factors that induce convulsions.

The interest of the group is predominantly based upon the existence of this dread disease within their family circle. They feel that alteration of the present discouraging outlook can only come through the organization of a systematic program of investigation. Thus through their efforts in cooperation with members of the medical profession whose work brings them in close touch with convulsive disorders the Society for Research in Convulsive Disorders was born.

The goal of the new Society is primarily one of creating interest and the collection of funds that will advance research into the origin of convulsive disorders. With the recent establishment of the Minnesota Medical Foundation, it is planned that finances collected by the group will be donated to the Foundation to be devoted to specified research projects.

The non-professional members of the Executive Board are sponsoring the raising of funds and creating public interest in the program, particularly among those whose lives have been saddened by the occurrence of this disease within the family. The medical members are concerned with the direction of scientific investigation through the granting of subsidies that will encourage further studies.

The outline of the program has been submitted to the Executive Board of the Minnesota State Medical Association, which has approved of the aims of the Society. The cooperation of the individual medical practitioner will be sought, for through him parents of children with convulsive disorders can learn of the work of the Society and have an opportunity to participate. Literature and pamphlets, available through the International League Against Epilepsy, with which the Society is affiliated, will be distributed to those members of the Society interested in receiving them. This is but a minor service to accelerate education and to offer encouragement and concrete suggestion to the daily management of these unfortunates. The real purpose of the Society must remain the accumulation of funds that will make the promotion of research possible.

Memberships in the Society are of four classes:

1. Active—$5 per calendar year.
2. Contributing—at least $1.50 per calendar year.
3. Sustaining—trust fund in any amount in excess of the annual dues of active members.
4. Honorary.

The medical members of the Board of Directors of the Society are: Dr. W. A. O'Brien, Dr. Gordon R. Kamman, Dr. H. W. Woltman, Dr. D. E. McBroom, Dr. Charles G. Ferrari and Dr. Irvine McQuarrie.

Non-professional members of the Executive Board are: Mrs. H. H. Creamer, president; W. A. Gordon, vice-president; M. E. Souther and Vincent Johnson.

Further information concerning the program of the Society may be obtained from Mr. James Norton, secretary, 823 Twenty-second Avenue South, Minneapolis, or the medical members of the Board of Directors.

Future Meetings

NORTH DAKOTA STATE MEDICAL ASSOCIATION MEETING
Minot

SCIENTIFIC PROGRAM
Tuesday, May 7, 1940

Morning

8:30—Registration.

9:00—Mayor Sandberg. Address of Welcome.

9:15—Dr. H. A. Brandes. President's Address.

9:30—Symposium: "Essential Hypertension."

9:30 to 10:00—From the Standpoint of Otolaryngology: Dr. Walter Camp, clinical assistant professor of ophthalmology and otolaryngology, University of Minnesota Medical School.

10:00 to 10:30—From the Standpoint of Ophthalmology: Dr. Thomas Allen, assistant professor of ophthalmology, Rush Medical School, Chicago.

10:30 to 10:45—Exhibits.

10:45 to 11:45—From the Standpoint of the Internist: Problems of Essential Hypertension — Dr. Charles N. Hensel, St. Paul, Minn.

Afternoon

2:00 to 2:30—Dr. R. C. Webb, assistant professor of surgery, University of Minnesota Medical School: "Hernia".

2:30 to 3:00—Dr. Paul A. O'Leary, professor of dermatology, University of Minnesota Medical School: "The Eczemas."

3:00 to 3:15—Exhibits.

3:15 to 3:45—Dr. Chester A. Stewart, clinical professor of pediatrics, University of Minnesota Medical School: "Convulsive Disorders in Children."

3:45 to 4:15—Dr. C. W. Schoregge, Bismarck, N. D.: "Simple Mastectomy vs. Radical Mastectomy in Carcinoma."

Demonstration of First Aid in Case of Fractures—Fracture Committee of American College of Surgeons. *Exhibition Hall.*

Wednesday, May 8, 1940

Morning

9:30 to 10:00—Dr. John L. McKelvey, professor of obstetrics, University of Minnesota Medical School: "Vascular Disease as Related to the Pregnancy Toxemias."

10:00 to 10:30—Dr. Monte C. Piper, Mayo Clinic, Rochester: "Chronic Infections of External Genitalia."

10:30 to 10:45—Exhibits.

10:45 to 11:15—Dr. F. E. Foley, assistant professor of urology, University of Minnesota Medical School: "The Choice of Operation for Bladder Neck Obstruction."

11:15 to 12:00—Economics: "The Work of the National Physicians' Committee"—John M. Pratt, executive director, Chicago.

Afternoon

2:00 to 2:30—Dr. Cedric Northrup, superintendent, North Dakota State Tuberculosis Sanitarium: "Role of the Private Practitioner in Detecting Pulmonary Tuberculosis."

2:30 to 3:00—Dr. Gordon Fahrni, associate professor of surgery, University of Manitoba Medical School, Winnipeg, Man.: "Thyroid Disease."

3:00 to 3:30—Dr. A. W. Adson, professor of neurological surgery, Mayo Foundation, Rochester, Minn.: "Early Skull Fractures."

3:30—Distribution of prizes.

SPECIAL PROGRAM

Ladies' Entertainment

Informal Reception at home of Dr. and Mrs. A. D. McCannel, Monday, May 6, at 8 P. M.

Banquet (semi-formal) at Episcopal Church Dining Hall, Tuesday, May 7, at 6:30 P. M.

Breakfast at Minot Country Club, Wednesday, May 8, at 10:00 A. M.

FRACTURES

Demonstration of First Aid in Case of Fractures—Fracture Committee of the American College of Surgeons. *Exhibition Hall.*

SEPARATE MEETING

North Dakota Society Obstetrics and Gynecology—*Recreation Hall, Trinity Hospital,* 12:30 Tuesday noon.

MINOT COUNTRY CLUB

Entertainment and Informal Supper (Smörgåsbord). Evening of social relaxation.

Golf. At Minot Country Club. Guests of local Medical Society.

NORTH DAKOTA HEALTH OFFICERS' ASSOCIATION
Sixteenth Annual Conference

Masonic Temple

Minot, May 6, 1940

PROGRAM
Dr. W. A. Wright, *President,* Presiding

Morning Session

Addresses of Welcome: (1) President, Advisory Board of Health, Dr. John Moore. (2) President's Address—Dr. W. A. Wright.

Reading of minutes of last meeting—Dr. M. M. Williams.

Appointment of committees.

"Recent Developments in Communicable Disease Control"—Dr. R. B. Radl.

Preliminary report on pneumonia control program—Dr. L. W. Larson.

"Proper Collection of Laboratory Samples"—Mr. Melvin E. Koons.

"Rural School Sanitation"—Mr. Lloyd Clark.

AFTERNOON SESSIONS

"Public Health Nursing"—Dr. F. G. Hubbard.

"Responsibilities and Duties of Health Officers"—Dr. D. R. Gillespie.

"Recent Advances in Treatment of Gonorrhea and Syphilis"—Dr. A. R. Gilsdorf.

"Venereal Disease Control Plan" — Dr. Frank I. Darrow. Films.

"Infant Mortality in North Dakota"—Dr. Russell.

"Infant Morbidity and Mortality"— Dr. Chester Stewart.

Discussion.

Reports of Resolutions and Nominating Committees.

SOUTH DAKOTA STATE MEDICAL ASSOCIATION MEETING

Watertown

PROGRAM

Monday, May 20, 1940

MORNING

9:00 o'clock—Scientific cinema.

10:00 o'clock—Dr. R. K. Ghormley, Dept. of Orthopedics, Mayo Clinic, "Choice of Bone Graft Methods in Bone and Joint Surgery."

Dr. J. V. Sherwood, superintendent South Dakota State Sanatorium, "Collapse Therapy in Tuberculosis by Means of Artificial Pneumothorax."

Dr. Raymond Bieter, Department of Pharmacology, University of Minnesota, "Serum and Specific Chemotherapeutics of Pneumococcus Infections."

AFTERNOON

Dr. R. K. Ghormley, "Non-operative Fracture Treatment."

Dr. H. D. McEwen, Department of Chemistry, University of South Dakota, Vermillion, "Some Recent Advancements in Our Knowledge of Vitamins."

Dr. Bieter, "Newer Drug Theapy."

4:15—Golf tournament.

Tuesday, May 21, 1940

9:00—Scientific cinema.

10:00—Dr. Louis A. Brunsting, Section of Dermatology, Mayo Clinic, "Helps in Treatment of Common Diseases of the Skin."

Dr. Stoesser, Department of Pediatrics, University of Minnesota, "Preventive Allergy in Infancy and Childhood."

Dr. R. G. Allison, Department of Radiology, University of Minnesota, "X-ray Therapy."

12:30 to 2:30—Round-table discussions led by Brunsting—"Eczema", Allison—"X-ray Diagnosis", Stoesser —"Prevention and Treatment of Diseases in Childhood."

Dr. F. W. Haas, Yankton State Hospital, Yankton, South Dakota—"Insulin and Metrazol Treatment of Mental Diseases."

Dr. O'Brien, Department of Pathology and Preventive Medicine, University of Minnesota—A clinical subject.

4:15—Second meeting of the House of Delegates.

7:00—Banquet. Dr. O'Brien will be the principal speaker at the banquet.

Wednesday, May 22, 1940

MORNING

9:00—Scientific cinema.

10:00—Dr. J. W. Duncan, Department of Surgery, Creighton University, Omaha, Nebraska—"Diagnosis and Treatment of Carcinoma of the Breast."

Dr. C. B. Wright, Department of Medicine, University of Minnesota—A medical subject.

Dr. Waugh, Section of Gynecology, Mayo Clinic—"Endometriosis".

AFTERNOON

Dr. Duncan —"Diagnosis and Treatment of Perforated Peptic Ulcer"; Dr. Wright, a medical subject, and Dr. Waugh, "Leukorrhea and Trichomoniasis."

MONTANA STATE MEDICAL ASSOCIATION MEETING

June 18, 19, 20, 1940

The following physicians will take part in the scientific program.

N. Logan Leven, clinical assistant professor of surgery, University of Minnesota; attending surgeon, Ancker Hospital. Titles—(1) Problems in Biliary Tract Surgery, (2) Skin Transplantation.

Walter A. Fansler, clinical associate professor of surgery, University of Minnesota. Titles—(1) Diagnosis and Treatment of Carcinoma of Bowel, (2) Office Treatment of Anorectal Disease.

William A. O'Brien, associate professor of pathology, preventive medicine, and public health; director, Department of Postgraduate Medical Education, University of Minnesota. Titles—(1) Cause and Prevention of Newborn and Premature Deaths, (2) Changes in Morbidity and Mortality Problems Incident to Aging of the Population.

Cecil J. Watson, associate professor of medicine, director, Division of Internal Medicine, University of Minnesota. Titles—(1) Treatment of Heart Failure, (2) Jaundice Considered from the Standpoint of Diagnosis and Pathologic Physiology.

Ernest M. Hammes, professor of nervous and mental diseases, University of Minnesota; chief, Neuropsychiatry Service, Ancker Hospital. Titles—(1) Craniocerebral Injuries, (2) Modern Treatment of Psychiatric Disorders.

Societies

TRANSACTIONS OF THE MINNEAPOLIS CLINICAL CLUB

Stated Meeting
Thursday, February 8, 1940
The President, James K. Anderson, M.D., in the Chair

THE SURGICAL MANAGEMENT OF PTOSIS OF THE LID

Walter H. Fink, M.D.

In considering the subject of ptosis we should keep in mind that there are, from the etiological standpoint, essentially two types—congenital ptosis and acquired ptosis. It may be further classified into non-surgical and surgical. The non-surgical type is moderate in degree and both the cosmetic effect and action of the lid are not impaired. In the surgical type, the function of the lid is impaired sufficiently to cause difficulty in using the eye. In addition the cosmetic effect is unfavorable.

From the surgical standpoint we are primarily concerned not with the cause of the ptosis but rather with the state of the superior rectus muscle because our choice of operation or procedure depends to a great degree upon whether or not the superior rectus muscle functions normally. If it does, many

Case II.

Case I.

operators elect an operation which utilizes this muscle to support the drooping lid. If it is paralyzed as frequently is found to be the case along with the levator muscle to the upper lid, we employ a procedure which is independent of the superior rectus. This may be an operation such as the Blaskovics in which a piece of the levator to the lid is resected or the Reese operation in which an attachement is made between the lid and the frontalis muscle. For functional and cosmetic results, these methods are not always satisfactory.

Most operators prefer to employ the first method in which the lid is attached to the superior rectus muscle provided, of course, that this muscle is not paretic. This method not only gives better cosmetic results but simulates the normal action of the lid. There are two methods of doing this operation. The motais method is the one in which the central third of the superior rectus muscle is cut and attached to the upper border of the tarsal plate. The other method is the Jamison in which the entire muscle is folded and attached to the tarsal plate. The later method has proved very satisfactory because of more firm attachment is obtained and over a broader area. The rectus

Case III.

muscle is not cut, consequently not weakened. If found necessary the suture can be cut and the tissue reverts to the preoperative state. An over-correction can be modified.

The three cases presented illustrate the Jamison method. The first case is that of a man 55 years of age who was born with a high degree of bilateral ptosis. Due to a promotion in which it was necessary to talk before groups he was obliged to have the condition corrected. This was done with satisfactory results.

A second case is that of a young woman who had a unilateral congenital ptosis of marked degree. Operative procedure resulted in a good functioning and cosmetic result.

The third case, a unilateral acquired ptosis. It came on suddenly following an acute infection. After one year, as the condition did not improve, the Jamison operation was done. The result was satisfactory both functionally and cosmetically.

In these operations there are certain risks, the chief one is the exposure keratitis which develops if the cornea is not kept moist. One satisfactory method is to make an air-tight shield of a used X-ray film and fasten it on with adhesive. After ten days, a celluloid attachment can be placed on the glasses which fits snugly against the face. This can be worn comfortably all day and night and facilitates the care of the eye.

Conclusion

Surgery offers excellent results in pronounced cases of ptosis of the lids. The Jamison method is ideally suited for the cases where the superior rectus is not involved.

ROENTGEN OBSERVATION IN ACUTE OBSTRUCTION OF THE COLON

Abstract

LEO G. RIGLER, M.D.

In the case of acute obstruction of the colon, as in acute small bowel obstruction, roentgen examination may be of great value. In the ordinary case, a film of the abdomen with the patient in supine position may be sufficient to give a great deal of information. In other instances, it may be necessary to do a barium enema examination. The latter is often unsatisfactory for this type of case, but in some instances it may be of great importance in finally establishing the diagnosis. In some cases, upright films may also be of some value in order to demonstrate fluid levels.

From the information obtained in this fashion may be demonstrated the following points:

1. Whether or not obstruction is present by the presence of gas in the large bowel. It must be borne in mind, however, that spastic conditions of the colon may occur which produce marked amounts of gas simulating obstruction.

2. The distinction between obstruction in the small and large bowels may be determined by the situation of the gas present.

3. The point of obstruction in the colon can often be made out by the end of the column of gas.

4. The diagnosis of a specific type of obstruction, acute volvulus of the sigmoid, is often possible. In these cases, there is a characteristic enormous distension of the sigmoid with gas, but showing much larger quantities of fluid within it than is the case in any other type of obstruction. The sigmoid flexure rises well over to the right side and films in the upright or lateral decubitus position may reveal these great quantities of fluid which are characteristic.

5. Repeated X-ray examinations, when conservative treatment is used, are extremely important to determine the degree of distension of the cecum because of the possibility of perforation.

6. Perforation of the colon can be readily made out by films made in the supine position, because the shadow of the outer as well as the inner wall of the bowel will be shown.

These points will apply regardless of the source of the obstruction and whether it be due to a carcinoma, diverticulitis, pressure from an extra-colonic mass, or some other type of inflammatory stricture. Repeated examinations with films which can be made at the bedside, are of great value in assisting the treatment of acute obstruction of the large bowel.

(Films were shown).

Discussion

Dr. RUSSELL W. MORSE: "I think this is a very excellent demonstration of these conditions. The striking thing is that volvulus of the sigmoid and volvulus of the proximal part of the colon may result in a dilatation of the bowel which is more marked than with any other obstructive lesion.

"I would like to ask Dr. Rigler for a little clarification of the term 'acute'. In many of these cases which have been shown there has been some obstruction over a long period of time. Those individuals with carcinoma have probably had partial obstruction. Those individuals with volvulus have most likely had recurrent attacks of volvulus and I think that this recurrence of attacks with partial obstruction is the thing that permits the bowel to reach this marked degree of distention without rupturing."

Dr. MALCOLM HANSON: "I would like to make this one comment. This very interesting presentation demonstrates very clearly the value of films of the abdomen. In many instances because of the information obtained from the preliminary films, it will be unnecessary to administer a barium enema. In reviewing seventy cases of intussusception, we noted that in most instances we had been able to determine the presence and location of the obstruction on the flat film of the abdomen."

Dr. H. W. CHRISTIANSON: "I cannot discuss this paper from an X-ray standpoint, but as a proctologist I would like to say a few words regarding the importance of making a proctoscopic

examination whenever there is any bowel irregularity such as constipation, diarrhea, or bleeding from the rectum.

"I saw a patient sometime ago who was to be operated on for obstruction. The X-ray diagnosis was carcinoma of the recto-sigmoid. I did a proctoscopic examination and found an impaction caused by bran. The mass was very firm and almost simulated a calcified substance and the roentgenogram did have the appearance of a carcinoma. I merely mention this to emphasize the value of a proctoscopic examination.

"In some cases of obstruction I have seen barium given by mouth and I think this is definitely contra-indicated in any of these cases."

Dr. O. J. Campbell: "I enjoyed the showing of these films. I think it is indeed fortunate that we can tell so much about a flat plate because I think all of us have had experience with cases showing incomplete obstruction who have been completely obstructed after barium has been given in the form of a barium enema."

Dr. R. S. Ylvisaker: "I would like to ask if these plates were taken with the patient lying on the back or on the abdomen?"

Dr. Leo G. Rigler: "They were practically all made lying on the back. Many were made at the bedside, some of them not. If made on admission they were sent to the X-ray Department on their way to bed. We prefer to do that. The colon is, of course, out of proportion in size. Dr. Wangensteen has insisted for a long time on our putting a nickel on the umbilicus and knowing the distance, he can make a rough calculation of the distortion by comparison with the size of the nickel on the film. That is very rough because you don't know how close the colon is to the film, but after you have seen a great number of cases one can easily determine these things. There are many objections to rolling the patient over, aside from the objection that you are disturbing the patient; for the pressure that is exerted tends to distribute the gases very irregularly.

"We refrain from giving barium by mouth, except in error, in cases of suspected small or large bowel obstruction. We do give barium enemas but with the thought in mind when we are giving them that if we find an obstruction we try to keep from going beyond it. I appreciate it is not a good thing, but it occasionally becomes necessary.

"The question of whether an obstruction is acute or chronic is a matter of definition. The patient suddenly gets very acutely ill. These people have had little attacks, have had difficulty for a period of time but when we see them the story is that for the last three days they have not had a bowel movement and have become more and more distended. The last three days they have been bedridden. It isn't acute in the sense that the lesion has begun acutely but the present situation is acute and requires immediate attention. It doesn't mean that the entire dilatation is necessarily acute but undoubtedly it has become more marked in the last two or three days."

Remarks on Showing Fluoroscopic Motion Pictures

Dr. Leo G. Rigler: Through the kindness of Dr. William H. Stewart of Lenox Hill Hospital, New York City, and also of the Eastman Kodak Company, I am privileged to show you this evening, some motion picture films which were made from fluorescent screen examinations of intra-thoracic organs.

Efforts at motion picture reproduction of the fluorescent screen image have gone on for many years, in fact since 1897, but with relatively little success. This is owing to the very low actinic effect of the type of light given off by the X-ray fluoroscopic screen. Through a combination of a very rapid screen, high exposure, very sensitive film, an exceptionally fine lens, and a great deal of very hard work, Dr. Stewart and his associates have managed to produce some rather good films. These exhibit, in motion picture form, the same observations which can be made in the fluoroscopic room, but they permit us to study these motions of the heart, of the diaphragm, the act of swallowing, the process of gargling, the movements of the knee joint, and other such dynamic processes at our leisure. We hope that further work in this field will enable us to obtain suitable copies of such films which will be of great value for teaching purposes.

THE INCIDENCE OF PULMONARY RADIATION FIBROSIS

Inaugural Paper

Cyrus O. Hansen, M.D.

Fibrosis of the lungs, when it appears as a sequellum to radiation therapy directed to the thorax is an embarrassing and distressing complication. Its incidence as stated by various authors varies from nothing to eighty per cent of cases treated. In view of the wide difference of opinion concerning its frequency and to evaluate its importance as a complication, I have attempted to review the pertinent literature on the subject and have reviewed a series of our own cases.

When a dose of radiation, either by the roentgen ray or radium, is given to the lungs certain changes may occur. The nature of these changes may grade from slight transient reactions that are barely discernible to permanent pathology, the essential feature of which is replacement of the normal lung structure with more or less dense fibrous tissue. It is also obvious that we cannot avoid irradiating the lung. We are called upon to treat malignancies involving the mediastinum, the esophagus and the lung which are overlaid by lung tissue which must be traversed to reach the pathology, and still more commonly we must give treatment to malignant breast lesions, where while the carcinoma is more or less on the surface it is still impossible to give an adequate dose without delivering an appreciable amount of radiation to the lung underlying.

Modern methods and techniques as well as mechanical development of apparatus have all converged on the idea of improvement of the depth dose. Higher voltages, higher outputs to enable the use of greater tube skin distances and heavier filtration to remove all but the most penetrating rays have been the aims and while these improvements have led to better effects on deep seated tumors, except where the lungs have been carefully considered it has been somewhat at their expense.

Prior to the advent of 200 kilovolt therapy in about 1920 there are almost no references in the literature to pulmonary damage, and the few that can be found are somewhat inconclusive. Quadrone in 1905 reported two cases of pseudo-leukemia that developed pleural effusions and he suggested the possibility of a radiation factor, however, one of his cases had a complicating pulmonary tuberculosis and in the light of more recent observations on proven cases, pleural effusions are rarely seen so his observations are of doubtful significance.

The first definite report of the characteristic findings of radiation fibrosis is generally ascribed to Groover, Christie and Merritt of Washington, D. C., who in 1922 reported before the Southern Medical Society on the use of more penetrating radiation which was followed in some cases by the lung changes which we now positively ascribe to this agent. Subsequently in 1923 the same authors reported before the American Roentgen Ray Society an amplification of their first report and in the discussion it was brought out by other men that they had observed the same clinical phenomena in their practices.

In 1922 Hines reported the first microscopic changes as seen at autopsy when he reported a definite increase in the fibrous tissue content in the lungs of two patients. His description deals with lungs that were extensively involved by metastatic tumor and consequently his work has been criticised in that fibrosis in this case is the response of the lung not to the radiation alone but to the combination of tumor treatment, as it is common knowledge one of the theories of radiation healing of tumors is the isolating effect by fibrous tissue formation. True radiation fibrosis is by definition only to occur in normal lung.

Clinically and roentgenologically the diagnosis of pulmonary radiation change is not easy. In both cases the picture is definite and constant, but the fact that the patient is a proven carrier of malignancy puts both the clinician and the roentgenologist in the differential dilemma of whether his observations have the etiological basis of metastases or of therapy.

Clinically the first manifestations are a persistent, dry hacking cough which may appear toward the end of the series of treatments especially if the protracted method is used, but more commonly the cough does not appear for eight to ten weeks following the last treatment. The patient usually comes to the office complaining of a chest cold that he cannot throw off. The other complaints are tightness in the chest and sometimes

a mild dyspnea. Physical findings are negative or minimal; if present they are the signs of decreased aeration, with suppression of breath sounds, and a few moist rales. Later and in more severe cases, decreased expansion, mediastinal shift and elevation of the diaphragm may be found. Pleural findings are infrequent. Occasionally there will be a slight elevation of the temperature and I believe if this is found it is evidence of infection and permanent change is more likely.

The findings described are of course the first evidence of pulmonary injury and need not lead to permanent fibrosis, in fact the majority of cases will reach a plateau in symptoms which may persist for several months and the whole picture will completely fade out without evidence either clinically or roentgenologically of ever having been present. This is the so-called pleuropneumonitis of Desjardins to which Groover, Christie and Merritt prefix "roentgen".

In the patients not so fortunate, dyspnea on exertion persists which may partially compensate but is permanent to some degree, fortunately pain is never a prominent symptom, either in the early or late stages.

The roentgen findings are also definite and would be interpreted without difficulty without the everpresent shadow of metastases in the background, as it is, the differential diagnosis is as difficult as anyone is called upon to make and usually observation over a period of several months is necessary. The first manifestations are usually seen as a diffuse haze over the involved area, which is probably a reflection of a mildly edematous lung. As the process progresses a fanlike spread from the hialus becomes apparent and patches of density may appear so that the whole picture may closely simulate an influenzal pneumonia. In due course of time retraction of the lung begins with shifting of the mediastinum to the affected side and elevation of the diaphragm. The most positive differential point rests on the fact that after reaching a peak the process begins to subside and compensation for the insult inflicted begins. The other obvious differential point is that except in cases where both lungs are irradiated, a roentgen pneumonitis is unilateral while metastases are almost invariably bilateral.

The residual findings are fibrotic strands through the involved area, permanent mediastinal shift, retraction of the chest wall and at times evidence of pleural adhesions.

Necropsy checks of these findings are scarce. Downs in 1936 reported on the largest number which covered 70 cases where the thorax had had intensive irradiation. His thesis was that pure roentgen or radium treatment on normal lung did not produce fibrosis without the addition of other factors such as metastases or infection; he did find one case showing marked fibrous tissue proliferation in the periphery of the lung, pleural thickening and rib necrosis, which seemed secondary to radium applied in the axilla.

Engelstad of Oslo describes a case of carcinoma of the esophagus coming to post three months following one moderately heavy protracted series of treatments. He found definite patchy fibrous infiltrations through the lung fields, with leucocytic and lymphocytic infiltrations and large numbers of macrophages in and about the alveoli.

From the experimental side Davis in 1924 in a thesis for a Master's degree studied the effects of radiation in a series of rabbits and dogs and gives autopsy findings in 12 animals, the dosage used is not completely transposable to modern terms, but was heavy, probably much heavier than the average therapeutic dose. His gross findings are tabulated as follows:

1. Pleurisy—one rabbit only.
2. Pericarditis—one rabbit only.
3. Reddish blue discoloration of the lungs.
4. Non-expansion of the lungs when inflated.
5. Areas firmer on palpation.
6. Increased resistance to cutting.
7. Cut surfaces show the smooth normal markings obscured. Appear more like chronic passive congestion or hypostatic pneumonia.
8. Cardiac changes in all but two dogs.

Microscopically he found

1. Thickening of the subserous areolar tissue.
2. Thickening of the alveolar septae, some cases the alveoli were compressed or obliterated.
3. Occasional blood vessel changes, thickening of the pars media.
4. Increased connective tissue about the bronchi and blood vessels. Demonstrated by Van Giesen stain.
5. Early changes were like marked edema, the air spaces filled with coagulum and desquamated epithelium. Marked congestion. Blood vessels packed with erythrocytes. No excess leucocytes.
6. Microscopically the auricular wall showed changes.

Engelstad in a monograph covering a series of 116 rabbits of which 15 were kept as controls, used varying dosages and techniques, from single massive doses to protracted fractional ones and using various voltages between 65 kilovolts and 175 kilovolts. He divided his dose classification into three types:

1. Subepidermiziden. Dosages in the neighborhood of 1700 *r* usually given in one sitting. If fractionated, the dose was increased. In 28 animals only slight changes were observed in the lungs. This dose as the title suggests produced little or no change on the rabbit's skin. This dose corresponds most to the generally applied therapeutic dose.

2. Epidermiziden. Dosages up to 3000-4500 *r* in one sitting. This uniformly produces epidermitis in the rabbit. With this dosage he uniformly gets a cycle of change in the rabbit's lung.

3. Lethal doses. Doses up to 21,000 *r*.

In the rabbit the lung changes occur following the Epidermiziden doses uniformly and regularly, four stages are described.

1. An initial stage which appears with the early skin reaction and shows degeneration of the lymph follicles, increased mucus production in the bronchi, hyperemia and leucocytic infiltration. This stage may begin as early as two hours after irradiation.

2. A latent stage of two to three weeks duration.

3. The main reaction. Degenerative changes of the bronchial epithelium and lung stroma as well as more or less acute inflammatory reaction in the form of peribronchial, perivascular and bronchopneumonic infiltration, this reaches its height in one to two months and slowly recedes. With the acute inflammatory reaction appear alveolar macrophages and giant cells.

4. A regenerative stage with fibrous proliferation and sclerosing processes, occasionally calcium deposition and proliferation of the bronchial epithelium. In six months the process comes to rest with more or less permanent damage.

From the above it would seem that radiation fibrosis is an entity that can be definitely seen, recognized and even predicted if one were to know the dose that was given, as it was also proven in the rabbit series that the quantity and time distribution were the only factors that gave definite differences in the results. Further Evans and Leucutia in 1925 state categorically that a single dose in humans of less than 100 per cent S.E.D. produces no change, doses of 130 to 140 per cent S. E. D. produce infiltration with clearing in six to nine months and doses larger than 140 per cent produce permanent fibrosis. They also state that repetitions of radiation produce "loci minoris resistentiae" and if repeated doses are given 80 to 100 per cent get permanent changes.

Clinically, however, these figures do not work. Engelstad in human clinical practice observed 21 cases of fibrosis in a series of 386 breast cases or an incidence of 5.4 per cent. In cases of carcinoma of the esophagus the incidence was higher, being 20.4 per cent.

Downs in his series of 70 cases of carcinoma of the breast coming to autopsy which had been treated in various places by various men and techniques found only one case which he was willing to call pure radiation fibrosis. He found other evidences of fibrosis but only with a complicating factor, usually metastases.

Burton Lee while he does not give figures states in regard to radium treatment of the breast, "Pulmonary fibrosis following interstitial irradiation of the breast is of infrequent occurrence and of insignificant importance."

In our own experience, of 150 cases of carcinoma of the breast treated on the 200 kilovolt therapy we have seven patients who have fibrosis in a seemingly normal lung or an incidence of 4.6 per cent.

In cases treated on the 400 kilovolt machine the findings are inconclusive as the majority of the cases already show pulmonary

changes. It is a definite clinical impression that breast cases treated at this higher voltage do definitely show an increased incidence and so for the past three years we have avoided any excessive radiation to the lungs whenever possible. Against this are notably two cases of isolated metastatic malignancy, one ovarian, the other sarcoma, who have both lived for over two years and with repeated treatment show little or no fibrotic change. Metastatic malignancy from breast in the lung, however, almost uniformly develops marked sclerotic changes.

In conclusion it is my opinion that roentgen pleuropneumonitis, and fibrosis, is of rather infrequent occurrence in the normal lung, especially if due care is taken in the selection of techniques to avoid unnecessary radiation of pulmonary tissue. It is probably unwise to use voltages over 200 kilovolts for postoperative prophylactic treatment and not more than one heavy series, or two lighter series should be used. In the other intrathoracic lesions the fields through which radiation is directed should be chosen so that a minimum of lung is irradiated. Complications are present in any therapeutic method and where the possible therapeutic benefits outweigh them a certain incidence must be accepted—our problem is to keep this incidence as low as possible.

(Lantern slides of representative cases).

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Discussion

Dr. Malcolm Hanson: Not infrequently do we see a small, non-symptom-producing amount of pulmonary radiation fibrosis following the X-ray treatment of the breast. With the present method of therapy, however, it is relatively rare that fibrosis becomes extensive enough to cause an appreciable number of symptoms. Also, it is remarkable the degree to which this fibrosis may and usually does clear.

Dr. Russell W. Morse: "I want to thank Dr. Hansen for his presentation. This is a subject in which we have all been interested and we have just been waiting for someone to look up the data on it. My experience with regard to fibrosis following radiation treatment of the breast lesion is in cases where we have used one series of treatments of fairly good intensity rather than several series of moderate intensity. We have had all kinds of reactions from mild erythema to local third degree reactions. The severity of the lung change will fairly well parallel the severity of the radiation in the skin and subcutaneous tissues.

"We find that the pulmonary change will occur about one month after the maximum reaction in the skin. Unless one realizes this, he is likely to pass over the pulmonary changes and then six months or a year later consider them as metastatic tumors rather than radiation fibrosis."

Dr. Leo G. Rigler: "I was going to say what Dr. Morse has said, that these patients almost always recover and while it is unfortunate it is not anything that is extremely serious with the exception of very few cases. We had one at the University, a patient with bilateral breast carcinoma, lesions in most of the bones, mediastinum, both axillae, etc. It was a perfectly hopeless situation but in the usual way we tried to prolong her life, so proceeded to irradiate her pretty extensively in various portions of the body, repeatedly and very diligently. After a considerable period of time, some years elapsing, she died, apparently in a state of exhaustion. An autopsy was held. If we had not had the original sections of the breasts and some of the glands, Dr. Bell might have suspected there was something very wrong about the situation, because he could not find any evidence of carcinoma anywhere. She had a fibrosis of the lungs and apparently died of exhaustion without any evidence of the malignancy."

Dr. J. S. McCartney: "I do not think I know as much about that as I should because as I was listening to Dr. Hansen's very excellent paper I was trying to recall some of the instances we have had presented over at the University. Our malignancies of one kind or another make up about 15 per cent of our postmortems and it may be that we are missing the fact that there is this roentgenic fibrosis of these lungs. Perhaps the individual who does the postmortem does not know about the amount of treatments that have been given or that any treatments have been given and loses sight of the fibrosis but may find the malignancy and entirely discount the question of any effect of the X-ray. Certainly there have been very few cases presented at our Tuesday meetings where the question of the effect of X-ray has been emphasized and it may be that we simply have not been informed and have not had all of the clinical data.

"I wanted to look up in our records to see what I could find but did not get the notice in time."

Dr. T. J. Kinsella: "I have enjoyed the presentation very much and wish to congratulate Dr. Hansen. There are some questions I would like to ask on the subject and a few remarks I should like to make. It seems to me that you said that the early reaction in the lung consisted of an exudate in the bronchi and alveoli. Might not this contribute to the development of the atelectasis which causes displacement early and can account for the fever in the early stage of the reaction? I think there is one case you showed which bears that out,—the one which developed pleural effusion and showed extensive atelectasis. Such displacement must be the result of the atelectasis and not fibrosis. The subsequent clearing of the process would seem to favor atelectasis rather than fibrosis as a cause for much of the displacement.

"Sometimes this radiation fibrosis does not clear up and some of these patients who develop extensive displacement of the heart and mediastinum undergo considerable permanent disability. I saw a girl recently at the General Hospital who was radiated some four or five years ago, her heart was within ¾ inch of the right chest wall, she can work and walk when she stays on a level but she cannot climb stairs or walk against the wind, and certainly has considerable disability due to the fibrosis.

"There are certain surgical implications in such a condition. If the patient has displacement enough to cause obstruction of mediastinal vessels or kinking of trachea or bronchi it may be necessary or might be advisable to relieve the condition by collapse of the chest wall. In other words, thoracoplasty might be necessary and might be of some value."

Dr. H. B. Sweetser, Jr.: "I wish to thank Dr. Hansen for bringing this subject up. It seems to me it is one that has not been discussed very much and it is very pleasing to hear it discussed dispassionately by himself and the rest of the roentgenologists.

"It seems to me it raises the question of whether your treatment is not just as severe as, or more severe than, the condition you are treating. For instance, in carcinoma of the lung, on the other hand, it is usually not a particularly rapid disease. I had one case (one should not discuss one case) of carcinoma of the lung in which I am sure that the radiation fibrosis contributed very definitely to the death of the patient. That is, the patient suffocated. She was most uncomfortable for weeks. From our clinical standpoint it raises a question.

"No doubt I am going to get in trouble but wonder whether it would not be better to take the surgical risk of removal of a portion of the lung rather than treating the patient with a most potent medium which evidently is not completely known in regard to its late results. Maybe it is known very well but it seems to me from this discussion that we have handled a very potent instrument with not as much knowledge as the clinical, general practitioner would like us to have.

"I wish to congratulate Dr. Hansen on his courage in bringing this up."

Dr. CYRUS HANSEN: "One thing, this does not occur very frequently. There is only approximately a 5 per cent incidence in breast cases. Dr. Engelstad got 20 per cent in his carcinoma of the esophagus cases. He was using the four fields. A lot depends there on just how we attack these conditions, because apparently, only the lung involved receiving the heavy dose of radiation gets this fibrosis.

"In regard to Dr. Sweetser's discussion, to oppose this case we have the case of a woman who came in almost three years ago with a large abdominal mass and secondary deposits in the lung from ovarian carcinoma. She is today entirely free of symptoms, shows no signs of fibrosis, so I think probably for every case *for* we can quote one *against*. It is a disagreeable complication.

"In the case that cleared up, she had a complication that is unusual: she had hemoptysis along with it. This isn't supposed to occur.

"In regard to Dr. Kinsella's suggestion about atelectasis being a factor, it didn't occur to me but it seems like a very logical suggestion.

"I think that this would be a very excellent problem for one of Dr. McCartney's students to write a thesis on. I was unable to find any good article from a clinical pathologist's standpoint except Downs of Philadelphia, who was essentially a radiologist."

ERNEST R. ANDERSON, M.D., *Secretary*.

Book Reviews

The Newer Nutrition in Pediatric Practice, by I. NEWTON KUGELMASS, B.S., M.A., M.D., Ph.D., Sc.D. 1155 pages, 183 illustrations. Philadelphia: J. B. Lippincott Co.

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Dr. KUGELMASS has written an extremely practical and comprehensive book on the newer knowledge of nutrition as it applies to everyday practice of pediatrics. He has welded a voluminous amount of experimental data on nutrition into workable clinical tools. An example of the completeness and excellence of the book, which may well become a classic in its field, is to be found in the third section of the volume, "Nutrition in Disease."

Here, in this section, he has arranged literally hundreds of diet tables, by years for use in treating various disease conditions at various ages. For example, there are four diets for a ten-year-old child with diabetes mellitus; there is a ketogenic diet for a six-year-old child; there is a diet for a fifteen-year-old child with nephritis; another diet for a fifteen-year-old child with nephrosis.

These tables represent the translation into the actual practice of knowledge of thoroughly up-to-date knowledge of nutrition gained by experiment.

The book is divided into three sections: the first section deals with nutritional physiology. It gives an understanding of the normal functions of the body in relation to each of the fifty essential nutrients, necessary for individualizing nutrition at all ages, types of constitution and levels of body function.

The second section outlines the established principles of nutrition in health. It gives sound advice for the advancement of "positive health" and the prevention of chronic disease. KUGELMASS believes that the standards of normality may be raised by qualitative and quantitative regulation of the essential constituents in the daily diet from birth to maturity.

Section three, with which 60 per cent of the text is concerned, takes up the matter of nutrition in disease. Most of the disorders of infancy and childhood are considered in terms of nutrient causation or involvement as a basis for nutritional therapy. While calculated diets and specific procedures are given, the author has undertaken to formulate the principles involved in applying specific foods for treatment by diet.

Plastic Surgery, by ARTHUR JOSEPH BARSKY, M.D., D.D.S.; 355 pages, 432 illustrations. Philadelphia: W. B. Saunders Co.

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This book can be recommended to both general surgeons and to those limiting their practices to plastic surgery. The broad field which Barsky covers in this comparatively small book speaks well for his ability to eliminate many unnecessary fundamentals and which are better obtained from texts for that purpose. The author shows mainly those operations which are typical for certain conditions and which have proven successful. His operative procedures, with the diagrams, are concise yet sufficiently complete to follow through. There are included chapters on the Nose, Orbit, Ears, Lips, Cheeks, Jaws and fractures of the bones of the face. The treatment of wounds, burns, frost bites, scars and keloids is discussed fully.

Operative Orthopedics, by WILLIS C. CAMPBELL, M.D., Memphis, Tennessee; 1st edition, blue cloth, gold stamped, 845 illustrations, 4 color plates, 1150 pages. St. Louis: C. V. Mosby Company, 1939. Price $12.50.

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This excellent volume meets the demand for an up-to-date comprehensive work on operative orthopedics and is written so that not only the specialist but also the industrial and general surgeon and even the general practitioner may benefit by its use. It is more than an ordinary atlas of orthopedic surgery as the author has presented and collaborated the mechanical, surgical, and physiological aspects of orthopedic practices and throughout the book has strived to evaluate their practical application.

There is a special chapter on surgical technic which deals also with the details of preparation and after-treatment. Chapters are also included on apparatus and surgical approaches and reference is made to these chapters throughout the book. The use of methods of traction and application of apparatus routinely applied are described in a special chapter. The apparatus covered consists of plaster of Paris casts, splints, braces, traction devices, and various special apparatus for inducing motion, all of which are adapted to meet the requirements of the individual case.

The subject of low back pain is covered very thoroughly with an excellent description and evaluation of operative procedures which are often advised in the treatment of sciatica and low back pain. The technic of arthroplasty of various joints is fully outlined with emphasis on adaptation for treatment. Discussion on dislocation is limited to the technics of open reduction. Eighty-nine pages are devoted to discussion of fractures with an additional 145 pages on the subject of malunion and nonunion of fractures. One of the most elaborate sections of the book is given over to the discussion of affections of the nervous system. The technic of tendon transplantation for correction of the deformity is adequately covered. There is also a complete section on discussion of the operative procedures for stabilization operations of the joints. A special chapter is devoted to spastic cerebral paralysis. Eight hundred forty-five illustrations are included to illustrate the steps in the operative procedures. A very complete bibliography is included after every chapter.

News Items

Dr. E. M. Larson, Great Falls, president of the Montana Tuberculosis association since 1934, has been re-elected for the ensuing year.

Dr. R. D. Weible has joined the staff of the Dakota clinic in Fargo, North Dakota.

Dr. H. L. Casebeer, eye, ear, nose and throat specialist, has opened an office in Butte, Montana.

Dr. B. J. Branton, Willmar, was named president-elect of the Minnesota State Medical association at the annual meeting April 22 at Rochester. He will succeed Dr. Bertram S. Adams of Hibbing.

Dr. A. R. Sorenson, Minot, North Dakota, has severed his connections with the Northwest Clinic and has opened an office with his son Dr. P. T. Sorenson.

The semi-annual diagnostic crippled children's clinic was held in Miles City, Montana, April 24.

Dr. B. H. Simons has been elected city health officer of Chaska, Minnesota.

Dr. T. D. Jones, formerly of Bowdle, South Dakota, is now in Chamberlain where he is chief surgeon in the hospital. He had practiced in Bowdle the past nineteen years.

Dr. Earl S. Porter, Lewistown, Montana, has been appointed to the state board of medical examiners.

Two new field clinics for crippled children in Minnesota have been added to the fourteen previously scheduled. Arranged by Dr. M. J. Nydahl, head of the Bureau for Crippled Children, the clinics to be held this month are: May 4, Willmar; May 11, Thief River Falls; May 25, Austin.

The first of ten North Dakota clinics for crippled children was held in Mandan April 6. Clinics are being conducted as they have been in the last three years and services are available to all mentally normal children under 21 years whose physical handicaps are of an orthopedic nature. Examining physicians are Dr. Joel Swanson and Dr. Harry Fortin, Fargo and Dr. Edward Parnall, Minot. Clinics are being held at Williston, Dickinson, Bismarck, Devils Lake, Grand Forks, Jamestown, Valley City and Fargo.

Dr. F. R. Schemm, Great Falls, Montana, addressed the Mount Powell Medical society April 15, 1940. His topic was "The Management of Edema in Heart and Kidney Diseases."

The Montana board of medical examiners recently granted reciprocity certificates to the following physicians who formerly had practiced outside the state: P. S. Cannon, Lincoln, Nebraska; R. E. Downey, Warm Springs; R. L. Eck, Lewistown; L. M. Farner, Helena; G. R. Fattic, Pueblo, Colorado; J. D. Green, Missoula; C. M. Mears, Spokane; J. E. Murphy, Whitefish, and R. M. Stuart, Denver.

Dr. J. A. Myers of Minneapolis addressed the joint meeting of the Indiana Tuberculosis Association and the Indianapolis Medical Society on April 16, 1940. His subject was "Scientific Procedures in the Diagnosis and Control of Tuberculosis."

The American Association for the Study of Goiter selected Dr. J. D. Pemberton of Rochester, Minnesota as president-elect and tentatively selected Boston for the 1941 meeting at the annual convention held in Rochester April 16, 1940.

The board of directors of the John and Mary R. Markle Foundation has awarded Dr. Cecil J. Watson, associate professor and director of the Division of Internal Medicine, University of Minnesota Medical school, a grant-in-aid of $3,600, in support of Dr. Watson's studies of the significance of the excretion of various porphyrins.

The National Tuberculosis Association has approved a grant of $500 to the University of Minnesota for a study under the direction of Dr. Arthur T. Henrici of the Department of Bacteriology for an investigation of the acidfast actinomycetes in relation to tuberculosis.

If you know of patients who have suffered injurious effects from the use of proprietary remedies containing desiccated thyroid, recommended or sold for obesity, or injurious results from indiscriminate use of desiccated thyroid in amounts of two grains or less per day, please report such cases to the office of the Journal-Lancet, 84 S. 10th St., Minneapolis, Minnesota.

Necrology

Dr. John P. Miller, 60, of Grand Forks, North Dakota, died April 18, 1940. A specialist in eye, ear, nose and throat diseases, Dr. Miller was on the staff of St. Michael's and Deaconess hospitals.

Dr. George N. Butchart, 70, pioneer physician of Hibbing, Minnesota, died April 7, 1940.

Dr. C. P. Rice, 64, of Breckenridge, Minnesota, who for many years practiced in Wahpeton, North Dakota, died April 12, 1940 at Breckenridge. He was a Spanish-American war veteran.

Dr. B. G. Morris, 59, of Beach, North Dakota, died at his home April 19, 1940. He came to Beach in 1927 from Tioga, North Dakota, and had practiced continuously since that time.

Dr. William D. Kelly, 75, of St. Paul, Minnesota, died April 7, 1940 at St. Joseph's hospital. He had practiced in St. Paul since 1887.

Dr. L. A. Sukeforth, 79, of Duluth, Minnesota, died April 7, 1940. A former Duluth city health director, Dr. Sukeforth had retired from private practice in 1924 but served as deputy St. Louis county coroner until a year ago.

Classified Advertisements

PHYSICIAN WANTED

EENT man preferred, to join clinic group. Excellent building; congenial associates; in thriving retail district 10 min. from Minneapolis loop. Attractive air-conditioned suite; Kelly-Kett and dental X-Ray with trained technician. Receptionist and phone attendant furnished. Completely equipped laboratory and operating room. Reasonable rental. References exchanged. Phone Main 0015 or address Box 672, care of this office.

PHYSICIAN WANTED

Young physician to assist established practitioner in small town. Scandinavian preferred. Fully approved and well equipped hospital. Address Box 673, care of this office.

POSITION WANTED

Experienced Kahler undergraduate nurse holding graduate's certificate Minneapolis General X-Ray course. Two years college, 1½ years O.B. and other nursing. Can type, drive car; have served as receptionist; qualified to assist in preparation of research articles, case reports, etc. Prefer city position. Phone Br. 5450 or address F. M. Davy, Apt. 35, 501 E. 14 St., Minneapolis.

POSITION WANTED

By registered nurse, now out of city. Adaptable to serve in office of doctor or dentist. My qualifications will satisfy you and I will take position in or outside Twin Cities. Address Box 674, care of this office.

OPPORTUNITY

Energetic, forward-looking physician willing pioneer northern Minnesota county seat 1400, will find good opening including purchasable building for needed hospital or clinic. District in public eye recently. Payroll town, only one doctor and dentist office. Always supported two, sometimes three. No hospital in county, grand opportunity for doctor, dentist. Most modern offices occupied many years by doctor and dentist. Thickly settled farming, dairy center. Address Box 675, care of this office.

Advertiser's Announcements

UNIVERSITY TO ISSUE VISSCHER BOOK

The University of Minnesota Press is pleased to announce the publication in late May of *Chemistry and Medicine*, edited by Maurice B. Visscher, $5.00.

The volume includes "Progress in the Application of Physical Chemistry to Medicine," "Recent Investigations in Metabolism," "Immunity and Chemotherapy," and "Nervous Control of the Organism." Fourteen papers presented at the fiftieth anniversary of the founding of the Minnesota Medical School—includes some of the country's leading authorities in this field—Best, Bronk, Burr, Cannon, Freundlich, Gasser, Green, Heidelberger, Helmholz, Long, McQuarrie, Peters, Smith, and Visscher. The volume is profusely illustrated and represents the most recent findings in this field.

VITAMIN ADVERTISING AND THE MEAD JOHNSON POLICY

The present spectacle of vitamin advertising running riot in newspapers and magazines and via radio emphasizes the importance of the physician as a controlling agent in the use of vitamin products.

Mead Johnson & Company feel that vitamin therapy, like infant feeding, should be in the hands of the medical profession, and consequently refrain from exploiting vitamins to the public.

A "DIFFERENT" DIAPER SERVICE

Pediatricians and other physicians have their attention called to the only diaper service owned and operated by a registered nurse—Baby's Diaper Service, in the lake district Minneapolis. The suggestion made by its management is that a doctor recommend the same service a hospital would demand and that the child's mother be told to accept no less in the interests of the infant.

In this "institute of diaper hygiene" each diaper is net washed in a special germicidal non-irritating formula of vitamin-D-rayed castile soap flakes and sterilized by 100 pounds of live steam at 330° F. After that it is fluffed in jets of clean, hot air in new airway dryers exclusive with this company in the Northwest, rendering it soft and extra absorbent. Special folding and wrapping deliver it to the mother spotless, sterile and dry.

It is claimed for the process that the cost is less than home methods and that it is safer from a sanitary standpoint.

AVERAGE DAILY REQUIREMENTS OF FIVE VITAMINS SUPPLIED IN ONE VIGRAN CAPSULE

A higher potency of Vigran, the five-vitamin capsule which supplies the full estimated daily adult prophylactic requirement of vitamins A, B_1, C and D, together with definite amounts of certain vitamin B complex factors, derived from a special high potency yeast, is offered by E. R. Squibb & Sons, New York.

Each of the new Vigran Capsules contains not less than 10,000 vitamin A units, U.S.P. XI; 1,000 vitamin D units, U.S.P. XI; 200 International units of vitamin B_1 (thiamin chloride); 500 International units of vitamin C (ascorbic acid); 100 gammas of riboflavin (vitamin G); 5 milligrams of nicotinic acid; and approximately 18 gammas of vitamin B_6 and 5 Jukes-Lepkovsky units of the filtrate factors. The vitamin potency of Vigran Capsules is established by physiologic assay in the Squibb Biological Laboratories.

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Pollinosis*

From the Standpoint of Preventive Medicine and Public Health

Ralph V. Ellis, M.D.
Minneapolis, Minnesota

FROM the standpoint of preventive medicine and public health the sicknesses caused by pollen have not received the attention which they deserve. Since its beginnings the science of preventive medicine has had a chief interest in the protection of mankind against the infectious or epidemic diseases. Ceaseless research has discovered the microörganisms responsible for a majority of these diseases, and we have set ourselves to the task of their control through various measures, including: (1) establishing barriers to prevent transference to susceptible human hosts; (2) eradicating the disease in the host reservoir; (3) destroying certain nonhuman host reservoirs; (4) inducing artificially a high state of resistance in the susceptible human. At times the trail has led us into the realm of the lower animals, and we have found it advantageous and necessary to enlist not only the aid of the veterinarian but also the coöperation of the animal husbandman. The problem of pollinosis leads us now to the plant kingdom and its solution may require the services of the botanist, the agriculturist, and perhaps the plant pathologist.

Although pollinosis is not in the true sense an infectious disease, it is in fact epidemic. Probably for no other human affliction can we predict with as much precision the time of occurrence, the period of duration, and the number of persons who will be affected in an epidemic. In pollinosis, as is generally the case with the infectious diseases, the etiologic agent is a single living cell. In each case the etiologic agent releases a toxic or harmful substance which, however, produces a characteristic effect only in such individuals as are susceptible to its action. In the case of pollinosis it seems definitely established that susceptibility is an acquired state for the designation of which the term allergy has received wide acceptance. However, the same idea supported by facts as well as inferences applies at least to some of the manifestations of certain of the infectious diseases. Certainly susceptibility to many of the microbic diseases is by no means universal.

Since the morbid states engendered by pollen are not reportable, the number of individuals affected is not accurately known. It has been variously estimated that from two to four per cent of the population in this country suffer from hay fever. Based on the personal history taken at the time of the entrance health examination at the University of Minnesota, five per cent of the students suffer from this condition. The incidence is approximately equal as regards the sexes. There is no reason to believe this group to be different in this connection than other groups of similar age.

The university population is comprised chiefly of persons of the late teen age or early twenties. Our series of cases, however, includes some graduate students, the age range of which is considerably higher. Of 735 students subject to pollinosis 699 were under 30 years and 36 ranged from 30 years to 62 years of age. Obviously this distribution is peculiar to the university group and in no way indicates the frequency which would be en-

*From the department of preventive medicine and public health and the Students' Health Service, University of Minnesota, Minneapolis, Minnesota.

countered in the general population. The average age of 735 students subject to pollinosis was 21.69 years. Five hundred forty-seven suffered from hay fever alone and 188 with asthma. The average age at onset for the former was 13.7 years and the average duration of the condition at the time of first examination was 7.5 years. Of the cases with asthma the average age at onset was 12.4 years with an average duration of 10.5 years per case at the time of first examination. The age at onset by five-year periods is shown in Table I, the length of duration at the time the patients were seen, Table II.

TABLE I.
Age at Onset of Pollinosis Among University Students
(735 cases)

Age at onset	0-5	6-10	11-15	16-20	21-25	26-30	31	Total
No. of cases	104	129	241	184	45	21	4	735
Pct. of total	14.1	17.6	32.7	25.6	6.4	3.1	0.5	100%

TABLE II.
Duration of Hay Fever and Pollen Asthma Among University Students at the Time of First Examination
(735 cases)

Duration in yrs.	1-5	6-10	11-15	16-20	21-25	26-30	31	Total
No. of cases	323	199	127	67	11	3	5	735
Pct. of total	43.9	27.1	17.3	9.1	1.5	0.4	0.7	100%
Pct. with hay fever alone	83.0	73.4	63.8	64.2	54.5	33.3	40.0	
Pct. with asthma and hay fever	17.0	26.6	36.2	35.8	45.5	66.7	60.0	
Total Pct.	100	100	100	100	100	100	100	

The amount of time lost and losses resulting from reduced efficiency cannot be satisfactorily estimated, but there is reason to believe that this is considerable. Most hay fever sufferers complain of inability to get a proper amount of sleep; this aggravates the irritability of temper and disinterest in the daily task. A valued and efficient employee changes status from that of an asset to become a liability to his employer. The eye symptoms are often so severe that work requiring much visual application must be suspended. When asthma develops work as a rule becomes impossible.

Concerning mortality attributable to pollen, no statistics are available. When asthma is recorded as the cause of a death, the exciting cause is not required to be reported. While the rate is probably small we do know that pollen is the responsible agent in some cases of fatal asthma.

There is, of course, no mortality resulting from hay fever alone; however, when asthma supervenes mortality is definitely increased. Dublin[1] concludes that on male risks with asthma the mortality in the aggregate is 27.4 per cent in excess of the expected by the American Men's Table and 63.7 per cent in excess by the Basic Mortality Table. A majority of those who become susceptible to pollen sooner or later develop asthma. Thommen[2] states that pollen asthma occurs in about 35 per cent of all hay fever subjects in New York and vicinity, while Huber[3] reports 54 per cent for Chicago and vicinity. In our series of University students affected by pollen, 25 per cent of the total presented asthmatic symptoms. The incidence of asthma increases with the number of attacks of hay fever. Whereas the incidence of asthma is only 17 per cent among those with a history of five attacks or less, about two-thirds are so affected among those in whom the attacks have been repeated twenty-five or more seasons. (See Table II).

Concerning the pollens which cause human illness throughout the length and breadth of our country, knowledge is by no means complete. Blackley's work which so conclusively established the proof of the etiologic role in hay fever included only the pollen of certain grasses. Evidence quickly accumulated that pollen of other plants was also involved. The presumption arose that any plant producing pollen is a potential cause of hay fever, giving origin to many erroneous notions which still prevail not only among the laity but also among physicians as well. It was not until 1917, when Scheppegrell[4] pointed out that only those plants which pollinate through the agency of atmosphere are important causes of pollinosis that any real progress was made in determining the causes. This contribution stimulated numerous botanical surveys to determine the species of anemophilous plants present in various sections of the United States and other countries. The published reports based on these surveys list the wind-pollinated plants together with the approximate periods of bloom. These reports therefore furnish information in regard to the potential sources of air-borne pollen. While these contributions are not entirely without value, the evidence concerning air pollution by the plants listed is largely circumstantial. For the U. S. A. more than 1,000 wind-pollinated plants have been enumerated. A large majority of these are generally believed to be unimportant and have been eliminated or exonrated through the application of certain postulates formulated by Thommen.[2] While these postulates have a definite value it must be admitted that such deletions as have been made from the list of possible causes has resulted from evidence largely circumstantial in nature.

There is available a method, the extensive use of which will furnish positive information concerning the plants responsible for atmospheric pollen pollution. To Airy appears to belong the credit for devising this method, which consists of exposing slides or plates coated with a sticky substance to catch pollen grains settling out of the atmosphere. By microscopy the various pollens are then identified and enumerated for a definite area of the slide surface. These data give accurate information concerning the kinds of pollen which pollute the air and in addition are a reasonably accurate index concerning the amount present.

As early as 1923 Scheppegrell[5] used the method to study atmospheric pollen pollution in New Orleans. Durham[6] deserves credit for extensive investigation of the ragweed problem by this method for a large number of cities situated in various sections of the country.

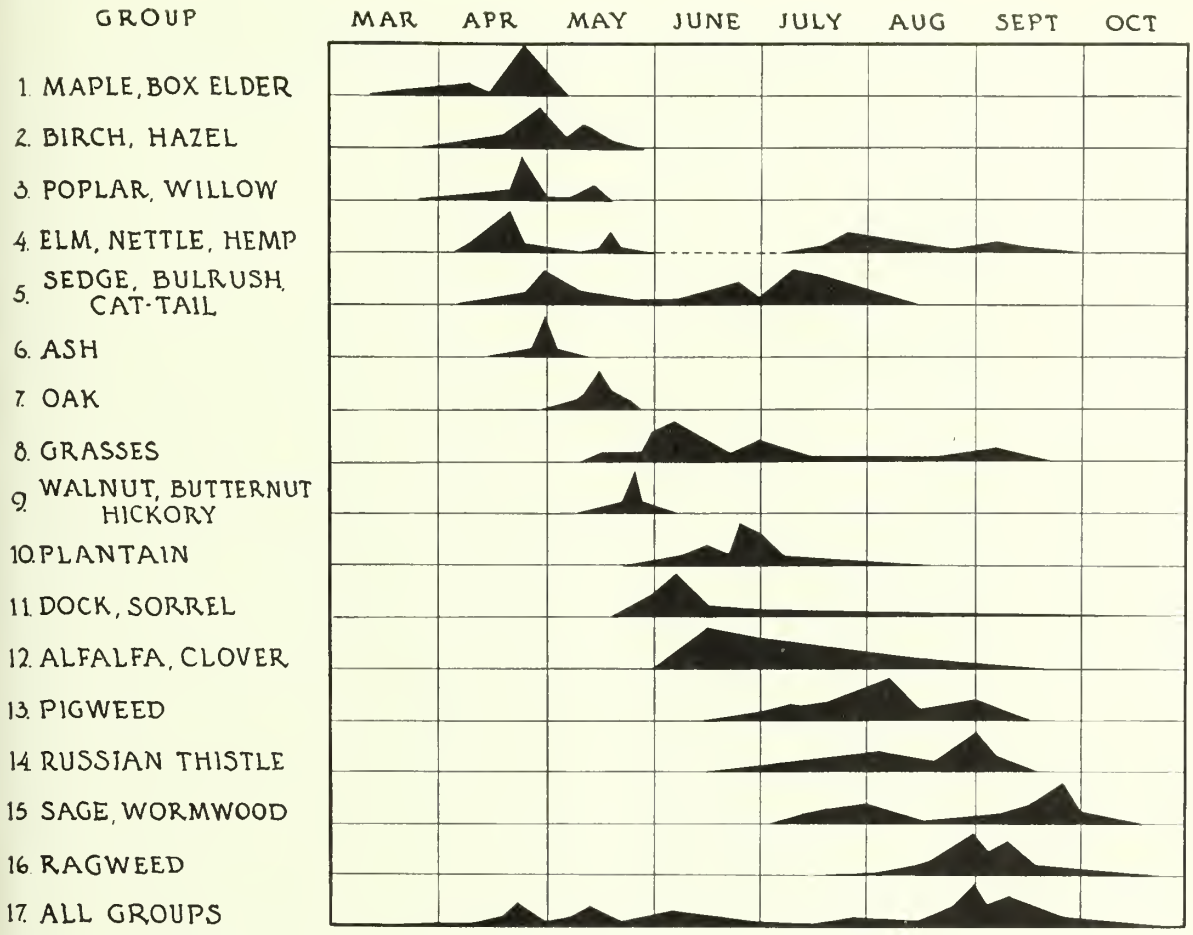

Fig. 1. Duration of pollination together with time of greatest pollen production of each group.

Relatively few additional reports of investigations carried out by this method appear in the literature and a goodly portion of these are sketchy and incomplete. Ellis, Rosendahl and Dahl[7,8] have recently reported concerning atmospheric pollen pollution for the Twin Cities and other points in Minnesota. Using the slide method daily observations were made from March 15 to frost over a period of several years. This kind of investigation obviates guesswork concerning pollen pollution of the atmosphere. The chief obstacle to a more extensive application of the slide or pollen count method lies in a dearth of competent pollen morphologists. The obvious answer is to train more individuals to do this work.

It is to be admitted that even a highly trained morphologist may not be able to differentiate the pollens of closely related species. This fortunately seems unimportant, for the pollens of closely related species appear to contain a common excitant. A person sensitive to the pollen of one species of oak, for example, reacts by skin test to the pollen of all oak species. Similar results are found with various other family groups, such as the Ambrosiaceae, Gramineae, Chenopodiaceae, etc.

The problem of the causes of pollinosis is greatly simplified when considered from this viewpoint which is amply justified by facts. The causes for Minnesota have been reduced to sixteen antigenic groups. Smoothed curves indicating the duration and period of greatest amount of air pollution appear in Fig. 1. In all except two relatively unimportant groups (Nos. 4 and 5) the pollens of all members of a group demonstrably contain a common excitant. Whether in addition to this common excitant members of a group may possibly contain specific excitants is as yet a matter of controversy. The species comprising the groups designated in Fig. 1 have been listed elsewhere.[7]

Multiple Sensitivity

Another fact which has not received sufficient consideration is that a majority of individuals suffering from pollinosis are susceptible to the excitants of two or more pollen groups. The ragweed group, for example, which without question has been justifiably emphasized as a cause of fall hay fever, in a series of 700 cases we found it solely responsible for only 3.5 per cent of cases. In an additional 39.5 per cent, cases for which ragweed was a causative factor, other causes were also important. (See Table III.)

Without accurate information concerning atmospheric pollen pollution it is impossible to make an accurate diagnosis of the causes of hay fever for the individual

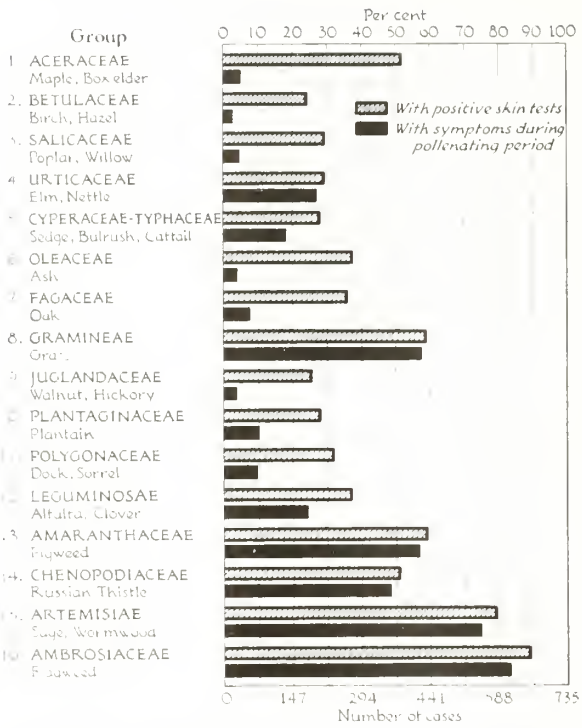

Fig. 2. Showing: (1) Lack of correlation between skin sensitivity and clinical sensitivity. (2) Relative clinical importance of various pollen groups.

patient. Patients often react positively to skin tests with pollens to which they exhibit no clinical sensitivity. The unreliability of the skin test alone is seen in Fig. 2. Obviously the period of illness for the patient must coincide with the period of atmospheric pollution by the pollen which induces a skin reaction before this has any diagnostic significance.

THE PREVENTION OF POLLINOSIS

The cardinal principles involved in the prevention are not dissimilar to those involved in the prevention of parasitic diseases and were enumerated earlier in this paper. The idea of a complete eradication of all the plants contributing to atmospheric pollen pollution is at once untenable. Certainly trees contribute much to the enjoyment and comforts of life to the majority. However, certain of the tree species produce large amounts of pollen, others relatively little. Furthermore, present knowledge indicates that the pollen of certain species is relatively much greater in toxicity than others. Since the planted trees in our largest population centers are responsible for practically all of the atmospheric tree pollen in those situations a more thorough investigation of this phase of the problem is needed. If it be found that certain species are prejudicial to the health of a certain portion of the population whereas others are not, certainly it comes within the province of public health authorities to educate or even to regulate the species of trees which may be planted.

The pollen of the grasses are in general more toxic than those of the trees. Grasses produce pollen only when allowed to head or bloom. Consequently well-kept lawns produce no pollen. Uncut waste areas and vacant lots are perhaps the most important sources. Much benefit would result from continuous cutting of these areas. The cereal crops which furnish abundant food supplies for man and livestock are grasses. However, with the exception of rye, none of these are important from the standpoint of atmospheric pollution. The forage and meadow grasses are mostly wind-pollinated and therefore more important. Where adaptable, alfalfa for economic reasons has to a large extent replaced the grasses as a source of hay and this should receive fur-

TABLE III.

Apr.	May	June	July	Aug.	Sept.	Oct.	Number	Per cent	Causes
							7	1.	Trees
							7	1.	
							28	4.	Grass
							48	7.	Weeds* (Not inc. ragweed)
							29	3.5	Ragweed
								16.5	Total
							276	39.5	Ragweed and weeds*
							161	23.	Grass and weeds
							141	20.	Trees, grass and weeds
							7	1.	Trees, weeds
							700	100.0	

*Ambrosia, Chenopod, Dock and Plantain Groups.

ther encouragement, for alfalfa, a self-pollinated plant, is relatively unimportant as a hay fever causing plant.

The remaining causes are almost entirely weeds. The beneficial results derived from the destruction of weeds causing hay fever as an idea is not of as recent origin as the attempts to control typhoid fever, tuberculosis, malaria, and other diseases. In comparison little progress has been made in the case of weed control. The education of the public to the relationship of noxious weeds to health should result in having such weeds considered from a new point of view. The eradication of these weeds may at first seem an insurmountable task, but the eradication of bovine tuberculosis was at one time probably regarded in much the same light. Yet in the relatively short span of two decades this has been practically accomplished.

Farming is essentially a battle with weeds. It is a well-known fact that in Europe the weeds are of little importance in atmospheric pollution as compared with this country. The most plausible explanation lies in their more intensive use of all available land for agricultural purposes. From an agricultural standpoint weeds are considered of so great importance that many states have enacted laws in attempts to control them. Cities have also enacted weed ordinances but in most places these are poorly enforced and in many more are wholly inadequate. Unified and concerted efforts in the form of improved legislation and machinery for enforcement by local, state, and federal authorities could not entirely fail to improve the situation.

However, for the present and undoubtedly for many years to come those who suffer must seek relief by other measures. Thousands annually seek relief by pilgrimage to areas highly touted as hay fever resorts, often with disappointment. Propaganda usually emanates from those commercially interested. Correct information based upon accurate investigation is not readily available. An area suitable for one type of case may be unsuitable for another. Complete studies in regard to atmospheric pollution throughout the length and breadth of our land will enable us in many instances (granted that the causes of his hay fever are known) to direct the patient to an area where he may expect and will obtain relief.

Another method of avoidance involves air cleaning or filtration. Modern engineering has perfected devices which efficiently remove the pollen as well as other solid matter from the air. Notwithstanding its demonstrated efficiency it has its limitations. A sufferer may so equip his own domicile that the air therein is kept pollen free, but if he be a breadwinner he cannot remain at home for the duration of the pollen season. Places where people work have not generally as yet been so equipped. Air conditioning in industrial and commercial establishments often involves only the regulation of temperature, with neglect of the importance of filtration. Undoubtedly much relief is in store for indoor workers with a further development and more extensive application of this principle. From spring to fall, however, the great outdoors offers so many attractive inducements that the relief afforded by filtered air is feeble compensation for the sacrifices entailed. Furthermore, a large portion of the sufferers by nature of their employment are obliged to carry on outside. For these the most successful method of prevention thus far devised consists of the preseasonal parenteral injection of extracts of the pollens to which they are susceptible, thereby raising the resistance to those pollens when encountered in the polluted atmosphere. Some are more successful with this method than others and considering the amount of detail involved in its correct and scientific application it would indeed be strange were it otherwise.

When each pollen is viewed as a separate and specific cause the problem of treatment is extremely complex. When viewed from the group viewpoint, as we have earlier suggested in this paper and elsewhere, and supported by certain facts, the problems of diagnosis and prophylactic treatment are greatly simplified. Results with treatment on this basis amply justify this simplification. In Table IV are given the results of prophylactic treatment of 1390 cases for the years 1935 to 1938 inclusive. The diagnostic and treatment materials were prepared in the University of Minnesota Hospitals Pharmacy on the group basis earlier set forth. The prophylactic injections were done by private practitioners of medicine not specializing in allergy. Results classified as excellent include those cases for which asthma has been completely prevented and the hay fever controlled to the extent of 90 per cent or more. Results are classed as satisfactory if the asthma has been relieved and the hay fever controlled as much as 50 per cent or more. Poor results include those with less than 50 per cent relief.

TABLE IV.

Results of Prophylactic Treatment with Group Pollen Antigens

Year	1935	1936	1937	1938
Number of Patients	143	271	456	520
	%	%	%	%
Excellent	40	59	51	46
Satisfactory	47	38.5	46.5	48
Poor	13	2.5	2.5	6

These results compare more than favorably with the published results obtained by specialists in allergic diseases. Their significance would appear to be enhanced by the fact that the diagnostic tests and prophylactic injections were all made by general practitioners or internists laying no claim to special training in allergy.

Summary

1. Illness resulting from atmospheric pollen pollution is an important problem in preventive medicine and public health.

2. Data concerning the causes of pollinosis are incomplete. Field studies are inadequate. Atmospheric

pollution should be determined with more exact methods, the accuracy and practicability of which has been amply demonstrated.

3. Positive skin tests with pollen antigens are not necessarily indicative of clinical sensitivity. Careful attention must be given to the correlation of the period of symptoms with atmospheric pollution, i. e., with exposure.

4. Specific treatment with group antigens is highly successful and greatly simplifies diagnosis and treatment.

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Bowel Obstruction at Birth*

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THE infant presenting evidence of bowel obstruction at birth or within the first few days of life, deserves the best attention of the pediatrician and the surgeon.

It is not necessary to discuss the frequency of its occurrence except to say that fortunately it is rare. Nor need we expound upon the various theories that have been suggested to explain the many types of pathology that may lead to obstruction in the newborn. It is enough that they can usually be explained on the basis of some defect or error in embryological development. The fact that most of them occur in the duodenum, close to the ampulla of Vater, or in the terminal ileum near Meckel's diverticulum strongly supports the contention, first expressed by Bland Sutton in 1889, that these anomalies occur at the sites of the most complex embryological changes.

The pathology is well understood. The literature until twenty-five years ago was almost an uninterrupted series of autopsy reports. It was not until 1911 that the first successful operation for atresia of the ileum was reported by Fockens of Rotterdam and not until 1916 that Ernst of Copenhagen first successfully operated upon an infant with atresia of the duodenum. Two types of pathology are well recognized: (1) *The intrinsic*, consisting usually of a complete gap in the continuity of the bowel, often a cord-like narrowing of the lumen, and occasionally a septum or iris-like diaphragm. (2) *Extrinsic*, having to do with external construction from peritoneal folds or adhesions, pressure of overlying vessels, or a volvulus of the midgut causing a block at the duodeno-jejunal juncture.

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Early recognition is essential to success. It, therefore, behooves the physician who first sees the baby to always consider in his differential diagnosis of congenital pyloric stenosis the possibility of an obstruction of the duodenum, especially when a tumor is not palpable and when the vomiting begins shortly after birth. The presence of bile is a valuable clue and the clinical picture of persistent biliary vomiting associated with visible gastric peristalsis and a flat lower abdomen is almost diagnostic of an obstruction just below the ampulla of Vater. If the vomitus becomes brown in color and there is generalized distention of the abdomen, an atresia of the terminal ileum is almost certain.

What chance has an infant thus afflicted with a complete or almost complete obstruction at birth to survive beyond a period of a few days, or at most a few weeks?

I. If the *obstruction* is in the *jejunum* or *ileum*, the likelihood of recovery is very small for the literature covering a period of over 100 years contains the reports of only three successful operations, Fockens of Rotterdam, 1911; Demmer of Vienna, 1921; Carter of New York, 1933. In each of these the surgeon was able to make a wide exposure, accurately locate the point of obstruction, and short circuit it with a lateral anastomosis. There is not one single instance on record where a successful outcome followed after ileostomy alone. In this group my own experience involves six cases, all of which terminated fatally:

Case 1. Infant, 1 day old, 1925. Marked abdominal distention and persistent vomiting since birth. Colon collapsed. Ileostomy under local. Death 7 weeks later. At autopsy: Atresia of terminal ileum

Case 2. Infant, 2 days old, 1929. Vomiting since birth. Marked distention. At operation complete obstruction at terminal ileum. Ileostomy. Death following day.

Case 3. Infant, 2 days old, 1929. Vomiting since birth. Distention of upper abdomen. At operation: Complete obstruction of jejunum from adhesions, which were divided. Death 4 days later from pneumonia.

Case 4. Infant, 3 days old, 1931. Vomiting since birth. Marked abdominal distention. At operation: Peritonitis. Complete obstruction of upper ileum with beginning gangrene of proximal loop. Lateral anastomosis. Death following day.

Case 5. Infant, 1 week old, 1931. Born with imperforate anus and marked distention of the abdomen. No relief from sigmoidostomy. Abdominal exploration showed complete obstruction in lower ileum. Lateral anastomosis. Death following day.

Case 6. Infant, 6 days old, 1935. Vomiting since birth. Marked abdominal distention. At operation: Complete obstruction in mid-ileum. Lateral anastomosis. Death following day.

II. If the *obstruction* is in the *duodenum,* the outlook is considerably brighter and the prospect of better results in the future is one of the reasons for the presentation of this paper. The literature, up to January 1939, reveals reports of sixteen successful operations, four of which have been contributed by members of this group, Dr. Ladd of Boston and Dr. Donovan of New York. In nine of these sixteen successful cases a gastro-enterostomy was performed. In five cases a duodeno-jejunostomy was performed, in one case a septum was actually removed and the duodenum closed, and in one case the type of operation was not stated. My own experience in this group involves eight cases, four of which have been successful:

Case 1. Infant, 3 weeks old, 1930. Vomiting of bile since second day. Marked dehydration, condition poor. Pustule in groin. Visible gastric waves. At operation: Obstruction of midportion of duodenum. Posterior gastro-enterostomy. Recovery. Five weeks later developed broncho-pneumonia. Autopsy: Anastomosis clean. Atresia 14 mm. long in region of ampulla of Vater.

Case 2. Infant, 2 weeks old, 1931. Projectile vomiting beginning soon after birth. Probable diagnosis: Congenital pyloric stenosis. Palpable tumor? Weight 5 lbs. Operation: pylorus normal. Duodenum dilated for 3 inches. Jejunum collapsed to size of goose quill. Posterior gastro-enterostomy with finest silk without clamps. Recovery. Excellent health 8 years later.

Case 3. Infant, 4 days old, 1931. Mongolian. Biliary vomiting since birth. Visible gastric peristalsis. Condition poor. Operation: Obstruction in mid-portion of duodenum. Posterior gastro-enterostomy. Death following day.

Case 4. Male, 7 years old, 1931. Picture of complete obstruction of small bowel. History of repeated attacks of partial obstruction since infancy. Operation: Volvulus of entire mid-gut on axis of superior mesenteric artery, fixed by dense adhesions, producing obstruction at duodeno-jejunal junction. Adhesions divided. Volvulus untwisted. Stormy convalescence. Recovery. Healthy 7 years later.

Case 5. Infant, 5 months old, 1935. "Blue" baby. Vomiting "off and on" since birth. Poorly nourished. Temperature 101°. Evidence of acute respiratory infection. X-ray shows huge duodenum. Operation: Lateral anastomosis under local. Death —broncho-pneumonia.

Case 6. Infant, 5 days old, 1938. Biliary vomiting beginning 2nd day. Deep jaundice. Condition poor. X-ray: obstruction 3rd portion of duodenum. Posterior gastro-enterostomy under local. Death: ten days later—broncho-pneumonia.

Case 7. Infant, 9 days old, 1938. Bloody vomiting since 2nd day becoming biliary. Dehydration. Loss of weight to 4 lbs. 4 oz. X-ray: complete obstruction in lower duodenum. Operation: Local. Duodeno-jejunostomy (ante-colic) without clamps. Entero-enterostomy. Recovery. In good health 6 months later.

Case 8. Infant, 8 days old, 1938. Biliary vomiting since birth. Visible gastric waves. Weight 5 lbs. 4 oz. X-ray shows complete obstruction in lower duodenum. Operation: Local. Duodeno-jejunostomy (retro-colic) without clamps. Recovery. In good health 4 months later.

Conclusions

1. Success in this field depends upon early diagnosis, adequate preoperative preparation, the most accurate surgical technique, and the use of the finest suture material.

2. With obstructions of the jejunum and ileum it is useless to perform an ileostomy. Wide exposure and lateral anastomosis offers only hope of success.

3. With obstruction of the duodenum above the ampulla of Vater, a gastro-enterostomy, below the ampulla or a duodeno-jejunostomy are the procedures of choice. A short-circuiting entero-enterostomy where there is narrowing at the angle of the suture line may make the difference between failure and success.

These little infants demand the most painstaking care after operation.

The Care of Severe Injuries of the Face and Jaws*

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SEVERE blows about the face may produce extensive fractures with only contusions on the surface, and widespread soft tissue lacerations may not be complicated by fractures. However, the two occur together so often that the care of the soft parts and of the bone cannot be separated, and careful consideration of the possible occurrence of fractures should be made in all patients. If it is assumed that fractures can be considered and cared for after swelling has occurred and subsided, the best chance for correct bone replacement is missed. If the true picture is recognized, simple procedures for bone replacement and fixation usually suffice. Special splints are seldom required although it is important to have someone on hand who understands the dental requirements because one of the most important functions to maintain is mastication, and this requires that the teeth occlude naturally.

The number of complications possible make the problem in severe injuries difficult, and one should be alert to make as complete a diagnosis as possible and have his findings recorded either before or at the time of operation. If tissue has been completely lost, this is of great importance in the final outcome and the extent should be noted. Skull fracture and brain injury, damage to the cervical spine and lesions of the orbit and the eye itself are very frequent and always should be looked for, recorded and treated as indicated.

Final union in upper jaw fractures may never be solid because of the thin plates of bone present or because of infection. In the lower jaw there is usually solid union but the fracture line may remain visible in the X-ray.

X-ray Examination

It is not necessary to rush these patients to the X-ray room, because manipulation might be contra-indicated if there were skull or cervical spine damage. However, when safe for the patient, complete views of all involved regions should be taken.

For the lower jaw, complete views of both sides including both condyles should be taken, because multiple fractures may be missed even at operation.

Roentgenograms of the facial bones should be taken, but are apt to be somewhat disappointing due to the superimposition of shadows in this area. The heavier ridges of bone show quite well in the antral and vertico-submental positions, but there may be many comminutions of the maxilla, ethmoid, nasal, and other thin bones that are entirely missed on the X-ray plate. Therefore, this condition has to be searched for at the time of operation.

When to do the Primary Repair

The primary repair should be done as soon as the patient's general condition permits and in the first 20 hours if possible, before swelling, organization of clots, and infection have occurred. If seen after this initial period and there is the necessity of manipulation through contaminated clots and edematous tissue, it is sometimes better to just approximate the soft parts and await the subsidence of swelling before replacing the bone fragments. However, the replacement of bone fragments should rarely be delayed longer than 7 to 10 days, because the fixation of small, comminuted chips after this time may make their accurate realignment impossible. Shock and neurological damage may necessitate delay and an intoxicated patient should not have his jaws wired together.

Type of Anesthesia

In many of these patients nerve blocks, especially deep injections of the branches of the fifth nerve,[1] are the most satisfactory for anesthesia. Occasionally field blocks or local infiltration suffice. These may or may not be combined with a basal anesthetic such as avertin. General anesthesia is to be avoided when possible, but is often necessary, especially in children. When used, the endotracheal method is almost always employed, though occasionally endopharyngeal insufflation is sufficient in very small children.

General Operative Procedures

In extensive injuries, it is often best to wait until the patient is in the operating room before manipulating the tissues simply to find out the extent of damage. There should be determination and recording of the loss or tearing of all the features and the extent of detachment of bones. The steps necessary to carry out the repair should then be determined and systematized into a definite, orderly, procedure.

Cleaning of these facial wounds is extremely important and should be done with soap and water followed by ether and saline irrigations so that local antiseptics are seldom necessary. The decision of when to clean and when to anesthetize is somewhat difficult. It is often best to clean as far as possible with the patient enduring it, and then get the local or block anesthetic in, or proceed with the induction of general anesthesia if it is necessary and safe to do so. Oil ground into abrasions is difficult to remove and may require scrubbing with a brush and the use of solvents such as ether or benzine. Bits of glass from rear vision mirrors or from completely

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a b c

Fig. 1. a, Extremely widespread soft tissue injury plus complete separation through the symphysis. b and c, Complete restoration in one operation which was done a few hours after the accident.

broken shatterproof glass are especially apt to be overlooked and for this reason it is well, if possible, to find out whether or not any glass was broken at the time of the accident.

Meticulous cleaning should constitute almost the entire debridement. The usual plan of wide excision of all torn edges should not be practised in the face. Very ragged edges may be smoothed by minimal clean excision, remembering that the loss of even 1/16 of an inch in a child's eyelid or ala may be deforming. Extreme conservatism should also be the rule in dealing with loose bone chips, as it is probably better to leave in some bone fragments that might die, than to needlessly discard any good supporting fragments that might live.

Bone replacement. If the nasal airway is occluded, it can be re-established by carefully introducing a long speculum and dilating it and then slipping through the

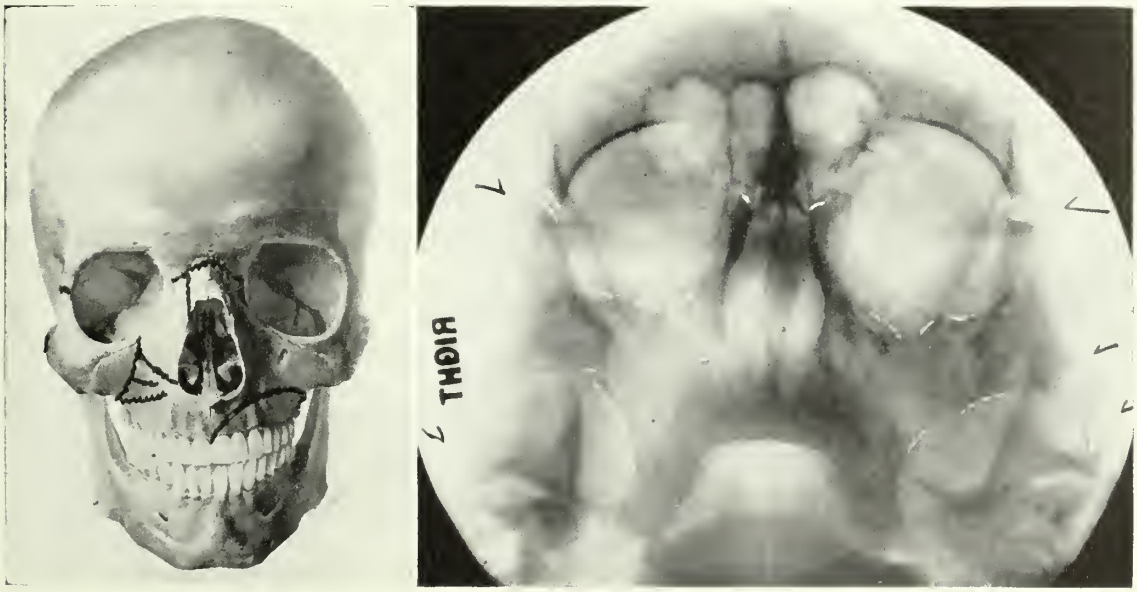

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Fig. 2. a, Diagram of frequent separations of the upper jaw, to which should be added a loosening all the way around on both sides just above the alveolus. b, Multiple comminutions of the facial bones, some of the areas having been scratched in for clearness. Separation of the zygomatic-frontal suture lines on both sides, crumpling of the zygomatic arches, and comminution about the orbital borders and antrum.

a b c

Fig. 3. Representative patient with complete facial separation. a, Patient who had suffered multiple comminuted fractures of practically all the bones of the face shown three weeks after operation which was done under basal and deep block anesthesia one week after the accident. The nose was completely loose and shattered, and, as a result of swelling, was just on a level with the cheeks. An air-way was established through both nostrils with a long speculum and maintained with rubber tubes, the palatal processes had cut through the palate in two places and these were forced back into place at the same time. The dorsum of the nose was elevated and held with a double sling of silver wire from side to side, put through the fracture lines along the frontal processes with large cutting needles and held on the side of the nose over lead plates as shown. The inner canthi were widely separated by an actual chiseling open of the face as the nose was driven backward. The canthi were replaced at the same time the nose was elevated and the fixation of the nose has helped to assure correct position and direction of the inner canthi. The orbital borders, zygoma and antrum are considered together because, as the zygoma is loosened, the border goes down and the antrum crumples under it. If the zygoma is driven backward, the zygomatic process of the temporal bone is crumpled either in or out. Restoration is done by making a small incision in the upper buccal fornix, entering the antrum through the fracture line and then replacing the orbital border, the frontal process, and the bulk of the zygoma and, if necessary, packing the parts in place by filling the antrum carefully with an iodoform gauze pack. The fragmented zygomatic process may be carried inward by external pressure, or lifted out with a small hook under it, placed either from the outside, through the mouth, or down from the temporal region as suggested by Gillies. The upper alveolus was broken in all the way on the left and was carried back into position and held with direct wires on the teeth across the fracture line and finally with fixation to the lower jaw. The lower jaw was broken through the symphysis and was held with the type of fixation shown in figure 5b; the upper jaws were used to support the lower and vice versa, although both were broken. b and c, Shows complete restoration of contour with normal expression, normal position of the inner canthi, no diplopia, normal vision, and normal occlusion. The most prominent feature of the profile, the dorsum of the nose, is restored. One operation.

meatus on each side a good-sized rubber tube; other bone replacements should then be done, such as elevation of orbits and the nose.

If the lower jaw is fractured, attention may be given to it at this time. If the patient is under general anesthesia, the individual dental wires may be placed, but the jaws should not be wired together until he is awake and has ceased vomiting.

The care of the various types of facial fractures will be considered under separate paragraphs, but it is usually best to complete as much of the bone replacement as possible before diverting attention to soft tissue repair.

Suture of soft tissues. For suturing the soft parts, new cleaning can be done and fresh instruments used if the mouth secretions can now be avoided. Surface key sutures may be used for the known points and these may have to be deep, but should never be wide, as wide suture marks can never be completely obliterated. Between these, buried No. 000 white silk sutures should be used to completely approximate all wound edges unless the skin edges are so thin that these cannot be put in. The remaining surface sutures are then placed not more than 1 or 2 mm. from the wound edges to obtain the final fine adjustment. No. 000 black silk usually suffices and may be removed in one to four days. Stay sutures may be put in from the inside of the cheek or nose. If they are needed on the outside, they should always be tied over a gauze pad to prevent cutting across the wound and leaving permanent scars.

In complicated tears (figure 1) a correct replacement may be difficult, but a start is made at some known point such as the nostril border, or the edge of an eyebrow. If none can be figured out, closure may be started in the center of the wound, and the remaining areas bisected successively until complete closure is obtained. If the final adjustment is not satisfactory, one should not be

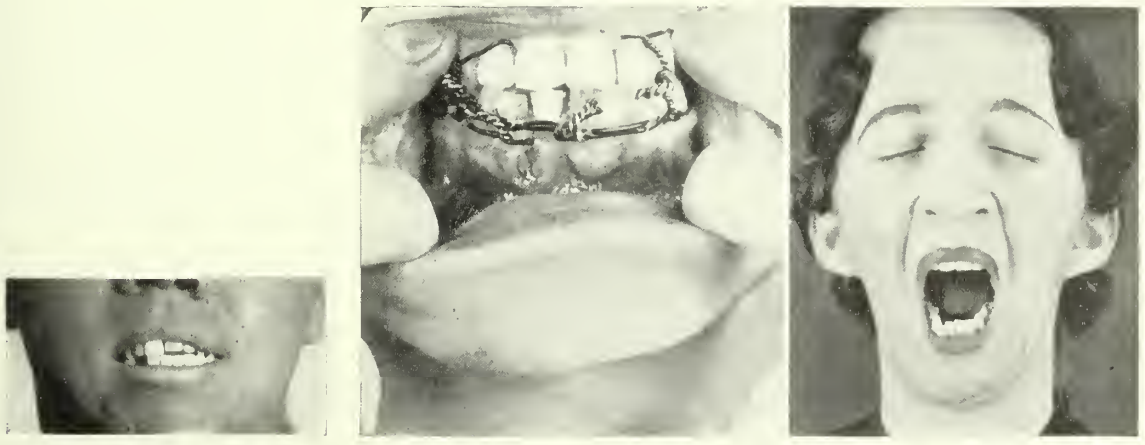
b d e

Fig. 4. a, b, Simple type of splint for elevating dental arch and face. Made by Dr. J. A. Brown for use in patient shown in d and e. The tray is filled with dental compound before it is used, and is held with a simple elastic sling from the top of the head. d, Patient with blindness in left eye, complete transverse and multiple facial fractures with almost total loss of the left upper jaw. e, Restoration of occlusion, nasal position, and of the cheek prominence with a free costal cartilage transplant. The right inner canthus is still somewhat displaced, as evidenced by the sharp curve of the tarsal border.

reticent in completely opening the wound and resuturing it. Triangular or trap-door flaps should be adjusted with particular care to avoid late deformity, especially about the lids, nose, and mouth.

Small drains may be placed advantageously, ordinary rubber bands sufficing for small wounds. If the immediate covering of the wound is of fine mesh grease gauze, it may be removed later with minimal trauma to the wound edges and sutures. A firm pressure dressing of mechanic's waste or marine sponges should be applied overall to minimize hemorrhage and swelling and, thereby, infection. The dressing should be regarded as a part of the operation and should be carried out with the same meticulous attention to detail.

Fractures of the lower jaw. The treatment varies according to the site of the fracture, but complicated appliances can be dispensed with in almost all instances. The keynote of the treatment, as in all other fractures, is accurate reduction of the fragments followed by immobilization. The patient's sensations may be of great assistance in telling when his natural occlusion has been re-established. No attempt to improve upon the patient's



a b c

Fig. 5. a, Permanent loss of occlusion in upper jaw fracture which might have been prevented by using the lower jaw for a splint by simply wiring the two jaws in occlusion. b, Method of Risdon in applying an anterior arch by putting long wires on the posterior teeth, bringing them around in front, fastening them together, and then anchoring individual teeth to this arch with finer wires. Besides this support, which is used mainly for symphysis fractures, fixation to the upper jaw with the teeth in normal occlusion is done and support applied from the chin to the vertex, if necessary. c, Functional result obtained in a patient with a fracture at the symphysis and through both condyles as well as a separation in the left upper jaw by using the fixation shown in b.

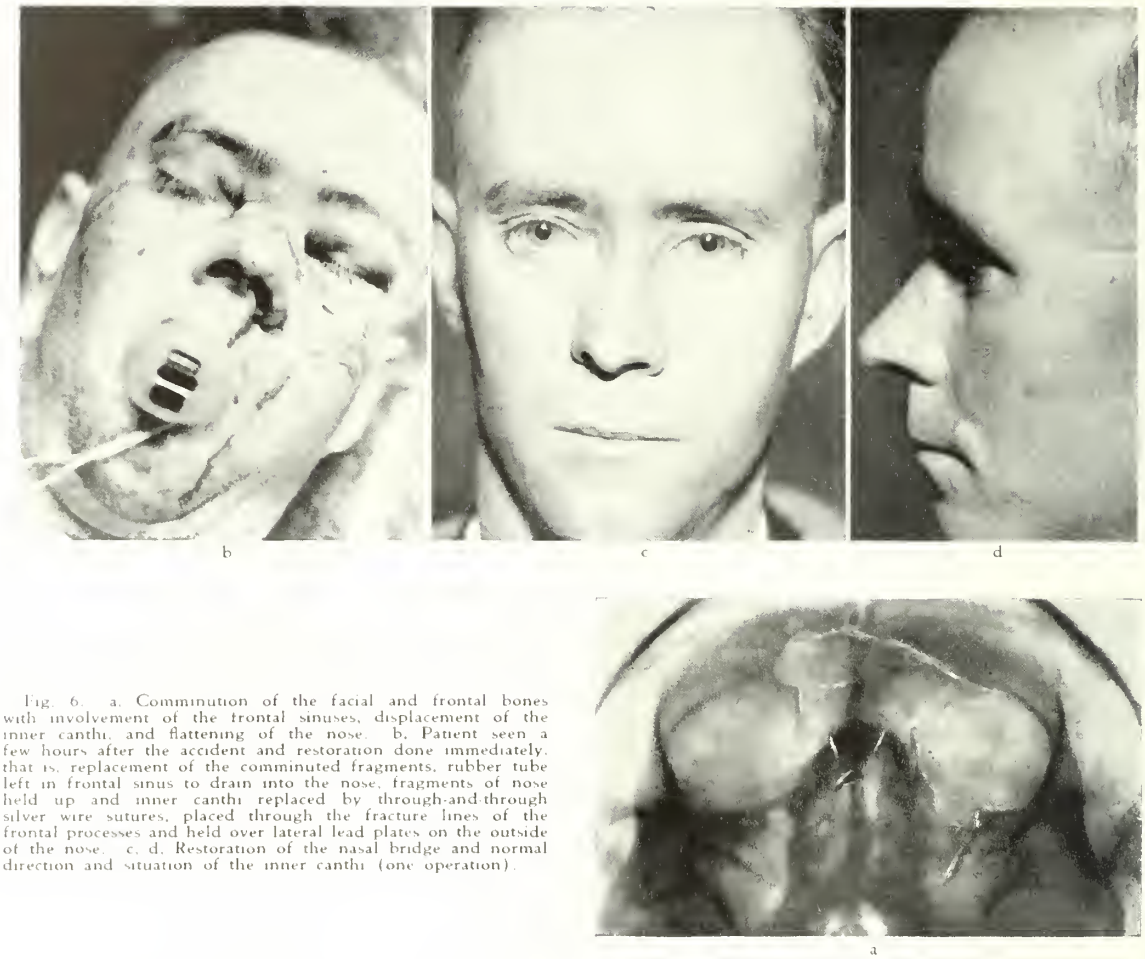


Fig. 6. a. Comminution of the facial and frontal bones with involvement of the frontal sinuses, displacement of the inner canthi, and flattening of the nose. b. Patient seen a few hours after the accident and restoration done immediately, that is, replacement of the comminuted fragments, rubber tube left in frontal sinus to drain into the nose, fragments of nose held up and inner canthi replaced by through-and-through silver wire sutures, placed through the fracture lines of the frontal processes and held over lateral lead plates on the outside of the nose. c, d. Restoration of the nasal bridge and normal direction and situation of the inner canthi (one operation).

former occlusion should be made in the treatment of these fractures.

In the majority of fractures in older children or adults with good teeth, immobilization may be accomplished by ordinary interdental wiring from the four lower pre-molar teeth to the corresponding upper pre-molar teeth. In addition, it is a good plan to have at least one set of interdental wires posterior and one set anterior to the fracture site if possible. The tooth in the fracture line should usually be left in place during the period of immobilization, even if it is a little loose. This is especially true of molar teeth, which often prevent the tendency to upward displacement of the posterior fragment in this area.

Symphysis fractures usually require a dental arch or band in addition to the above, to prevent the tendency to "rocker motion" of the fragments. The method of Risdon is an excellent one in caring for these fractures (figure 5b).

Fractures of the condyles are frequently amenable to attempts at closed reduction followed by ordinary interdental wiring. It is usually not necessary to consider open reduction or primary excision, unless the condyle is completely out of the glenoid, notwithstanding many statements which have been made to the contrary.

Edentulous jaws may require circumferential wiring of the mandible to the patient's dental plate or to his upper teeth, or direct wiring of the bone fragments.

If the soft tissues have been torn off the jaw exposing the fracture site, it is usually most expedient to do direct wiring of the fragments.

A small dependent drain should be placed directly up to the fracture site, unless one is reasonably certain that it is not compounded into a tooth socket.

Displacement of Bones of the Upper Jaw

Transverse facial fractures occur usually from heavy blows dispersed over the face. There may be a level of separation at the frontal-zygomatic suture line and at the glabella on both sides; there may be one through the wall of the antrum that may extend all the way around and involve the pterygoid region; and frequently there is a complete separation entirely around just above the dental arch. The whole face may sag down and become noticeably elongated, and the dental arch may be completely loose to the patient's own sensation and on

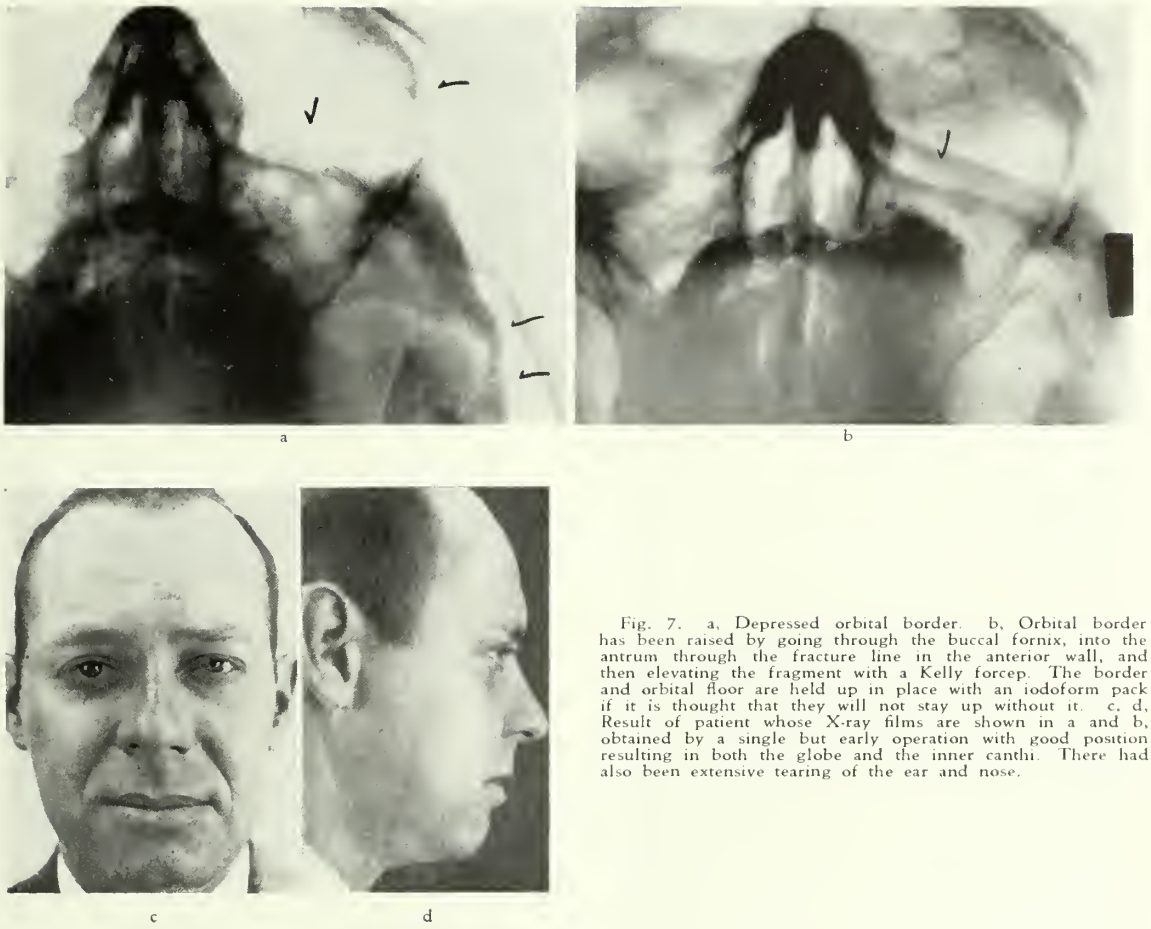


Fig. 7. a, Depressed orbital border. b, Orbital border has been raised by going through the buccal fornix, into the antrum through the fracture line in the anterior wall, and then elevating the fragment with a Kelly forcep. The border and orbital floor are held up in place with an iodoform pack if it is thought that they will not stay up without it. c, d, Result of patient whose X-ray films are shown in a and b, obtained by a single but early operation with good position resulting in both the globe and the inner canthi. There had also been extensive tearing of the ear and nose.

moving it with examining fingers (figures 2, 3, 4, 5, 6).

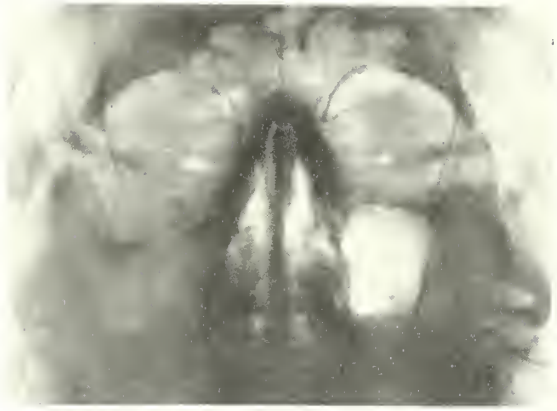
Nasal, septal, and palate fractures frequently occur along with the above separation, and these small thin bones may be comminuted into multiple pieces. The nasal structure, including the cartilages, may be completely crumbled, and there may be one or more complete lacerations through the palate caused by the disrupted bone cutting through; the nasal passages may be completely occluded also (figures 3, 6, 10).

The zygomatic bone and orbit. The zygomatic bone (malar or cheek bone) frequently receives the blow but is itself seldom broken. Instead, it is torn loose from its moorings at the frontal, zygomatic process of the temporal bone, and the maxilla. The main displacement will be according to the direction of the force; if from the front, the zygomatic process will be crumpled back and broken by the zygoma itself; if from the side, the ascending ramus of the zygoma may be tipped in and impinge on the orbital space. In nearly all loosening of this bone, the antral wall crumples, and if it should sag down too much, the orbit becomes elongated and the globe may descend so much that binocular vision is impaired (figures 3, 4, 7, 8, 9, 11). Blindness may result from section of the nerve by a loose, thin piece of bone and from intra-ocular or direct ocular damage. The extra-ocular muscles and nerves may also be torn (figure 4). The lacrymal apparatus may be impinged on if the frontal process of the maxilla is driven in.

Inner canthus displacement occurs if the nose with the frontal processes of the maxilla is crushed backward, there being an actual chiseling open of the front of the face. This deformity is as important as any other in which to accomplish an early repair, because, if left until fixation occurs, the canthi probably never will be sunken in normally again (figures 3, 4, 6, 11).

Nasal flatness goes along with the canthus displacement and the two are corrected together by withdrawing the depressed tissue and bones, molding them into their normal positions, and frequently holding them there with through and through silver wire sutures inserted under the separated frontal processes and held on the outside of the nose over lead plates (figures 3, 6, 10).

The general rule for repair is simply to replace these fragments and maintain them in position with the least manipulation possible. This replacement amounts to an open reduction, and access to the orbital border can be gained by a short incision in the buccal fornix, then into the antrum through the fracture line that is almost always present. The depressed border can then be ele-



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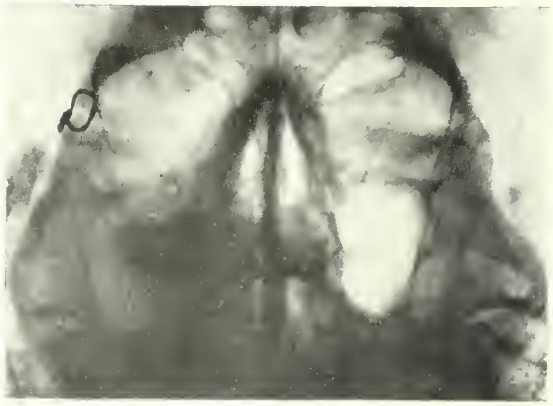

b

Fig. 8. a, Marked displacement of entire zygoma after two weeks with no hope of holding it in position from the inside of the antrum, because it is broken so far away laterally from any support. b, Zygoma replaced and held by direct wiring from ascending ramus to frontal bone; access to bone gained by opening a scar of accident. This elevation is usually not successful if fragment becomes firmly fixed out of position; then globe has to be elevated within orbit (see figure 9).

a

b c

Fig. 9. a, Loss of lateral wall and floor of orbit so that no elevation is possible. b, Patient whose X-ray film is shown in a. The main object of restoration is for eye function, as there is marked depression of the bony orbit, complete ptosis of the lid, and paralysis of the frontalis. c, Globe elevated with one block of free costal cartilage and held medially with another. With this replacement of the globe there was subjective improvement in the ease of ocular movements. Binocular vision does not always return after this procedure because of the delicate balance necessary for this function. Elevation of the lid was obtained by a fascial loop to the forehead and a second long one from the temporal fascia through the tarsus to the opposite frontalis. The upper orbital border was restored with a costal cartilage transplant put in a periosteal sling to give good fixation of the graft. All three pieces of cartilage were fresh hemografts from the mother.

vated into position with a Kelly clamp. This bone may be locked in place, but, if there is much comminution, the whole number of fragments, including the anterior and lateral walls of the antrum, may be "mulched" in position and held with an iodoform pack in the antrum, with the end left just through the opening in the fornix.

If there is derangement of occlusion, the lower jaw can be used to splint the upper by fixation of the teeth followed by the application of a bandage from the chin to the top of the head. Frequently, the closing power of the muscles attached to the lower jaw will suffice for this, and the overhead pull can be omitted (figures 4, 5).

Qualifications of Treatment

A detailed account of the care of all the fractures and other complications cannot be included here, but in the individual patient all parts have to be considered and it is not possible to consider bone or soft tissue repair entirely alone. A few further noteworthy subjects are as follows:

Where wide areas of soft tissue have been lost, as good a closure as possible should be made, with an accurate notation of the estimated loss for future reference in repair. If necessary, simple closure of skin to mucosa can be done.

If orbital borders are left down too long there may be such derangement of the ocular muscles that binocular vision may never be attained, even though the globe is later raised.

Late lip scars often become so hard that it may be thought that a foreign body has been left; this is apparently due to the glands that are present, and is occasionally relieved by radiation.

If the late deformities are studied, the requirements of early care may be made more clear. Wide suturing,

a b c d e

Fig. 10. a, Complete depression of the nasal dorsum from injury without loss of tissue. b, c, Complete restoration of dorsum by chiseling free the depressed bone and cartilage and holding it forward on a mattress wire sling. d, e, Depression following injury plus loss of tissue so that free cartilage transplant is necessary for elevation as in e.

a b c

Fig. 11. a, Depression of frontal area, deformity of lid and inner canthus. b, Result of "backing" tissue down into lid from forehead in V-Y procedure through old scars. c, Result of fastening tarsal border to frontalis muscle for elevation of lid, and of filling the bony depression with free fascia.

infection, misplacement of flaps, failure to accurately replace bone fragments, and keloid formation seem to account for most deformities (figures 4d, 9, 10, 11). However, some secondary repairs are necessary in almost all extensive injuries, and this possibility should always be considered from the start with the patient or some responsible relative.

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Intra-Ocular Malignancies*

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THE three most important intra-ocular malignancies are melanomata, retinocytoma and carcinoma. Melanomata, the most frequent, is found in adults; retinocytoma in the early years of life; and carcinoma is metastatic from some other part of the body.

Melanomata is the most important neoplast of the choroid. It is a rare disease. Statistics show that it occurs in one of three thousand patients. It occurs chiefly in persons past the age of 40, without any known cause and usually in eyes otherwise normal. Rarely does this disease present itself in both eyes. The first symptom noted is a disturbance of vision, usually in a peripheral part of the field. A small neoplasm at or near the macula may attract the patient's attention earlier than one situated in front of the equator. It is important to stress that the common symptom of poor vision is significant although it is usually treated lightly and thought of only in connection with glasses. In the past year, I have had occasion to see three patients with intra-ocular malignancies, who came in because of failing vision in one eye. Because this symptom is thought of in reference to glasses, I think it is important to point out that failing vision should be given greater consideration as it is one of the earliest symptoms of intra-ocular malignancy. Distortion of objects, and flashes of light are also among the early symptoms. Later the symptoms of secondary glaucoma become evident. Sudden loss of sight from an intra-ocular hemorrhage or rapid extension of the retinal detachment occurs.

Ophthalmoscopic examination reveals a retinal detachment which in the early stages is sharply circumscribed with its edges elevated. The tumor may be seen through the retina as a slate gray or dark gray mass when it is still adherent to the retina. More often the retina is so far elevated by fluid that the tumor cannot be seen. Transillumination of the globe reveals an area corresponding to the tumor through which the light is not transmitted. If the tumor is near the posterior pole, it is necessary to pass the tip of the transilluminator back to this region through a conjunctival incision.

The next stage is that of extra-ocular extension by permeation of the peri-vascular lymphatics in the sheaths of emissary vessels such as the venae vorticosae and the anterior and posterior ciliary vessels, the sheaths of ciliary nerves, the lamina cribrosa and the optic nerve. Extra-ocular extension may also occur by direct infiltration of the sclera and invasion of Tenon's capsule and the tissues of the orbit. In later stages when secondary glaucoma has developed, the cornea and lense are often so opaque that a view of the fundus is impossible. In every case of glaucoma in which the fundus cannot be seen, the presence of intra-ocular tumor may be suspected.

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Prognosis. When the eye is excised early in the progress of the disease and before there is invasion of the sheath of a ciliary vessel or extra-ocular extension, the prognosis as regards life is good. Even in apparently early cases, however, metastasis may already have occurred. When enucleation is performed late, metastasis has often occurred, though this may not be determinable by clinical means. Those who have extra-ocular extension die of metastatic deposits from six months to two years after removal of the eye. Metastasis occurs particularly in the liver, lungs, shafts of long bones, sternum, vertebrae and skull. Death results from malignant cachexia.

If extra-ocular extension has occurred, this can be recognized in the anterior part of the eyeball by the presence of a dark gray or brown mass under the conjunctiva and attached to the sclera. Extra-ocular extension through the posterior part of the eyeball may give rise to proptosis but at a later date this becomes less evident owing to a reduction of the intra-ocular pressure and subsequent shrinking of the eye.

The three cases I wish to report presented the typical findings of early involvement. The patients came because of visual failure and the eyes were removed with no evidence of extension.

Local recurrence is exceedingly rare unless signs of extension are present at the time of enucleation. If a large extension is already present, the much more disfiguring operation of orbital evisceration, followed by radium, is indicated.

Differential Diagnosis. The following must be kept in mind: (1) A simple detachment of the retina; (2) a retinal cyst may be differentiated by transillumination; (3) a tuberculous mass will present signs of inflammation, a hazy vitrous or overlying retina; (4) detachment of the choroid and choroidal hemorrhage.

Treatment. Simple enucleation is the only form of treatment advised when the diagnosis of melanomata has been made. If performed early, the patient has a good chance of life. The only contradiction to enucleation is the presence of metastasis as determined by general examination, which should include roentgenograms of the chest. When the only eye is involved the patient may refuse enucleation and a trial of radium applied by the insertion of radium seeds into the tumor (Foster Moore) may be made. Radium or roentgenotherapy after enucleation is not necessary unless obvious extension into the orbit has occurred.

Retinocytoma (glioma retinae) is the only important neoplasm to affect the retina. It resembles in no way the slow-growing true gliomata of the brain and optic nerve and since its cells are primitive retinal cells of a stage before differentiation into glia or other cell types occurs, the name retinocytoma or retinoblastoma is a proper one. The disease occasionally shows a marked

familial or hereditary character, occurring in several generations of the same family or in several offspring of the same marriage. In about 10 per cent of the cases both eyes are affected. The disease is not common, intra-ocular malignant melanomas being about ten times as frequent. Infants or children below the age of 5 are usually affected. There is some evidence that the actual beginning of the neoplasm is in many cases before birth, though it is seldom recognized until a late stage. A few cases are on record in which older children, up to the age of 12, were affected.

Symptoms. Often the first symptom is the deviation of the eye, due to lack of vision. Examination at this stage reveals one or more white or gray masses attached to the retina and often protruding into the vitreous. Growth is usually rapid and if deviation does not occur, the first sign may be a yellow reflex.

As the disease progresses, the whole posterior segment of the eyeball becomes filled with the tumor, and the yellowish or pinkish mass pressing forward to the posterior surface of the lens gives the characteristic cat's eye appearance. Soon the anterior chamber becomes shallow, and a severe and painful secondary glaucoma is often the result. In later cases the sclera is penetrated and a large extra-ocular mass may be seen. Extension back along the optic nerve occurs early with involvement of the brain and death. Usually one eye is involved at first, but the second eye is often involved later, usually by an independent neoplasm.

The most common portal of extension of the tumor out of the eye is through the optic disc. Such extensions are found in about one-third of all cases reaching the amaurotic cat's eye stage. The growth extends along the optic nerve, and in about 10 per cent of all cases reaches the intra-cranial cavity in spite of enucleation. Metastasis takes place primarily in the lungs, retroperitoneal lymph glands, and the long bones. Involvement of the skull, liver, and other organs is less frequent. Death may occur from cachexia, from intra-cranial extension, or from intestinal obstruction as a result of the abdominal growths.

The diagnosis is often confused with pseudoglioma. In pseudoglioma are included those cases presenting the typical clinical appearance of glioma in which, on enucleation, the mass behind the lens is found to be inflammatory rather than neoplastic.

Treatment. Enucleation is imperative. When the second eye is involved either before or after removal of the first, irradiation is usually preferred to double enucleation. Immediate enucleation should be performed in any case in which no certain evidence of metastasis can be discovered. In order to eliminate this possibility not only a careful general examination, but also roentgenograms of the long bones and of the lungs are required. When metastases are already present, nothing is to be gained by enucleation unless the eye has become unmanageably painful. Radium treatment often produces a temporary shrinkage of the metastatic growths, but up to the present, has not been reported as resulting in a cure in cases reaching this stage.

In those cases in which bilateral tumors exist, the parents often prefer to risk the child's life rather than to consent to bilateral enucleation. In such cases, the eye containing the larger tumor may be removed, while the other eye may be treated with radium. The latter may be applied externally or if the tumor is well circumscribed, minute radium needles may be inserted into it.

Local recurrence is exceedingly rare unless signs of extension are present at the time of enucleation. If a large extension is already present, the much more disfiguring operation of orbital evisceration is indicated.

Carcinoma occurs in the choroid by metastasis, usually from tumors of the breast and stomach. It is often bilateral. The clinical picture is the same as that of sarcoma, except that growth is less rapid and death from other metastases often occurs before the stage of glaucoma is reached. A careful history and search for a primary tumor elsewhere is indicated in every case of suspected intra-ocular tumor. A history of operations for malignancy is often given. Enucleation is advised only when symptoms of glaucoma develop.

I wish to stress the importance of early recognition of intra-ocular malignancies. This condition is the problem of the general physician as well as the oculist because frequently it is the former who is first consulted by the patient. When a patient complains of failing vision in one eye, it is important to think of malignancy, as failing vision is frequently the earliest symptom.

DISCUSSION

Dr. WALTER E. CAMP: I think Dr. Fink is to be congratulated on these interesting cases he has had and also upon the splendid way he has presented them. The history of the nomenclature of tumors of the choroid is interesting. When these tumors were first described they were called sarcomata, leucosarcomata and melanosarcomata, depending upon the absence or presence of pigment. About fifteen years ago, Dr. Mary Knight, working at the Mayo Clinic described the origin of these tumors from the pigment epithelium and called them melano-epithelioma. Within the past year Dr. Georgiana Theobald, of Chicago, described their origin from the Swann sheath cells of the perforating ciliary nerves. If this is true they again would be classified as ectodermal tumors and not sarcomata.

One of the interesting things about these tumors is that they very frequently occur in blind eyes. Any eye which has been blind for years due either to injury or disease, which suddenly becomes painful should be looked upon with suspicion for this tumor. If the eye is blind enucleation should be done early because you may many times find an intra-ocular tumor.

In regard to retinal blastomata, these were formerly called gliomata, but they are not gliomata. Many times they have more than one focci of origin in the retina. They are very more than one focus of origin in the retina. They are very malignant and often give metastasis into the bones of the skull, the bones of the face, and local recurrences are common. That is not true of malignant melanomata, local recurrences are very rare unless the eyeball has perforated. A good many theories have been presented to explain why in malignant melanoma, five or ten years after enucleation you will get metastasis in the liver and other viscera. In all probability these are not metastasis. It is hard to conceive of tumor cells circulating in the blood and becoming implanted that late. In all probability they are independent tumors. In regard to metastatic carcinoma, these tumors reach the eye through the blood stream, they do not go by way of the optic nerve and are very often bilateral.

I think Dr. Fink's cases are very good. He has brought out the most important clinical points.

The Inter-Relationships of Health and Physical Education*

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I WAS much pleased to receive an invitation to take part in the joint session arranged by the program committee for the discussion of a topic so important as the Inter-relationships of College Health and Physical Education.

The growth in the size and influence of these two organizations is astonishing even to one like myself who has had for many years an active part in their proceedings. It is not so long ago that a group of twenty or so—many of them medically trained—attending a meeting of the College Directors' Society would represent a majority of its members; and a relatively short time has passed since a little group of four or five men met in Chicago to organize the Student Health Association.

The development of this new organization was the outcome of a feeling on the part of some of the men that the programs in the older Society were tending to lay too much emphasis upon the consideration of activity programs and allied questions, and that too little attention was being given to the specific medical and health interests and needs of college students. We felt that greater emphasis should be placed upon function, instead of structure, in physical examinations; the development of a clinical service that would correspond more closely with modern medical practice; that more attention should be given to the prevention and treatment of injuries incident to our rapidly growing program of competitive athletics; and, finally, to the recognition and treatment of personality difficulties and maladjustments which were becoming more numerous and important. Add to these factors the increasing needs for instruction, in the rudiments at least, of healthy living which for years had been carried on more or less efficiently by some of the medically trained college directors, but which tended to receive less attention as other duties became more pressing. These criticisms should not lead us to overlook the fact that Dr. Edwin Fauver called to our attention some years ago; namely, that the older generations of doctors in charge of college departments of physical education were the ones who established a medical service for students, gave instruction in the hygiene of their time and initiated the theory and practice of periodic medical examinations.

However, as colleges increased in size—some of them beyond existing provision for housing and instruction—student life became more complex; intercollegiate athletics assumed greater importance; required courses in physical training and personal hygiene tended to become perfunctory and failed to satisfy the fundamental needs of the average student; the values of intra-mural athletics were not generally recognized; and medical service in dispensary and infirmary was as a rule limited to the immediate physical condition presented by the student and had little if any concern or contact with other phases of the general program.

Efforts to satisfy the needs of the students under these changing conditions involved increases in service and staff—and it is no wonder that differentiation and specialization of personnel, functions, objectives and services gradually developed in a field that should be closely coördinated and focused upon the needs of the student as an integrated person.

The girls' institutions were, and are, better off in these respects, by reason of a greater wisdom or better luck, because their problem was not complicated by an intercollegiate athletic system. Agnes Wayman recognizes this fact in her statement:[1] "The women in physical education have been very fortunate for the most part, in not being handicapped in their planning by overemphasis upon intercollegiate competition and the exploitation of their activities for publicity purposes. They have been almost entirely free to develop their programs along educational lines."

Don't misunderstand me—I am not crying down athletics as such, nor intercollegiate competition. I have gained too much from my experience as competitor and coach in intercollegiate sports to fail to recognize and appreciate the values inherent in such activities. I *am* criticizing the intensity of their development in a relatively small group of students and the exaggeration of their importance as a part—for too many a major part—of a college experience to the virtual neglect of those students who haven't the ability to make one of the big teams.

As a consequence of the factors mentioned and others similar to them, the tendency toward a differentiation of interest, emphasis and function grew more marked in the work and development in these two organizations and even in various phases of the programs of the organizations themselves—each group in its own little orbit—in spite of efforts made to keep these various activities coordinated and focused on the individual student.

It is not difficult to understand how this dispersion came about—human nature being what it is—inasmuch as it was in principle, at least, in harmony with the programs of mental training in colleges where each department hands out its prescription and material to the student, who is left to digest and assimilate the various portions of intellectual pabulum as best he may.

It is a long way from this condition to the concept of the ideal university represented by Mark Hopkins at one end of a log dealing with the intellectual demands

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1. A Modern Philosophy of Physical Education.

and the all-around personality development of a student at the other end of the log. It should be noted, however, that in some institutions of higher learning efforts to correlate the work of various departments in a given field are meeting with gratifying success. The purpose of this symposium is—I take it—to discuss and formulate a basis for a similar development in our own special fields to the end that the work of the various specialists in health and physical education may be coördinated so that their efforts will be as sharply focused on the needs and capacities of the individual student, as if these various services were rendered by one person.

Now, it appears to me that the foregoing discussion points clearly to the necessity for the re-establishment of a coöperative relationship among the different phases of health and physical education so that the results of their joint efforts may be even more useful for the average student. But there is another reason that makes this recommendation even more important; that is, the necessity for a coördination of efforts made on behalf of the student who is emotionally immature when he comes to college and is subject to personality difficulties of one sort or another.

Now this is not a new problem. It deserves, however, to be given particular attention because the proportion of students handicapped by conditions of this type has increased with considerable rapidity during recent years, and particularly because they frequently appear in students who are intellectually talented—but overconscientious and sensitive.

Reliable studies of young persons during the past twenty years or so indicate that there is an increase in the number of adolescents who are unequally developed; i. e., physically and intellectually they correspond with chronological age, while emotionally they are untrained and immature. Students of personality are of the opinion that the underlying cause for the existence in physically sound persons of emotional instabilities, undesirable attitudes, indifference, combativeness, and other signs of maladjustment have their roots in childhood. These characteristics may exist in varying degrees, may persist throughout life—serving as points of weakness under stress and strain—or they may be replaced by more desirable qualities in a different environment under more favorable influences and as a result of a *process of re-education*. I emphasize—*re-education!*

In any event, the responsibility for the development of these traits is generally attributed to the profound changes that have commonly taken place in family life and relationships. It is important to realize that this phenomenon is quite as apparent in families that are comfortably well off as it is in the very rich or the poor, and is even more marked in the girl than in the boy.

For many generations, parents of all classes were in a position to fulfill their functions as natural educators of the child's emotional life; while the school teacher furnished the systematic training of the child's understanding and intelligence. In other words, these two processes went along side by side. But as the family life has changed under modern conditions, the influence of the family has lessened, and more responsibility has fallen upon the school to recognize and provide for the needs in the emotional training of the child. General education has not yet fully realized this need—nor is it equipped to satisfy it.

In addition to these general changes, there are other specific factors in early life that tend to interfere with normal emotional control; i. e., over-protection by either or both parents; deprivation of initiative; "broken" family; financial troubles; or such conditions as: physical inferiority or handicap, endocrine disturbance, stammering, etc.

These factors serve as the ground-work of personality problems: emotional immaturity, anxieties and tensions, feelings of inferiority, introspection, intolerance of criticism, irresponsibility, evasiveness, lying and inability to face unpleasant facts.

Such types of personality react badly under pressure of academic or social competition, family or financial difficulties. These stresses commonly find their expression in worry, introspection, insomnia and procrastination, or body protests such as eye trouble, digestive or cardiac upsets, asthma or other symptoms for which no physical cause can be found.

For such persons the modern college presents a brand new set of problems and responsibilities. The boy or girl who comes directly from the well ordered, closely supervised life of the "prep" school, or the student who has lived under home influences while attending day school, finds himself abruptly confronted by freedoms and responsibilities with which he is quite unfamiliar. His program of courses is much broader. His ability to make wise choice is undeveloped, and unless he is unusually fortunate he has not yet decided upon his major line of interest among the many possibilities that are available. This new situation calls for planning, decisions and self-guidance that furnish opportunities for mistakes that may represent serious handicaps to his progress. However wisely he may plan his program, he still is confronted with a heavier load of work assignment, more independent reading than he is accustomed to, and generally is lacking in experience in digesting what he reads and in taking useful notes on lectures.

Add to these problems the necessity for the wise use of leisure time, and it becomes obvious that the youth who has not learned how to budget his time and energy is in great need of help and guidance, particularly during his first year—and in some cases well along through his course. These conditions, though touched upon in barest outline, represent a very severe test of the character and judgment of the student and the ability to plan and work effectively without undue emotional stress and strain.

These emotionally immature students stand these experiences badly and unless the underlying reasons are recognized early and adequate treatment made available, the result may be a real mental breakdown—or at best loss of confidence and a crippled personality struggling against heavy and uncorrected handicaps.

In the course of the past fifty or seventy-five years, carefully controlled studies of individuals—young and

mature—have furnished us with a reliable body of knowledge about physical growth and development and about physical health and its modifying factors. These studies have been supplemented by the development in recent years, to which I have referred, of a better understanding of inter-relationships of physical, mental and emotional factors in an individual. In other words, the development of a concept of the wholeness and unity of the personality.

Every function, coördination, attitude or faculty that we possess is developed to its capacity in only *one way*, and this is by suitable activity and experience. The most effective way to correct emotional instabilities, lack of confidence, fears and apprehensions in the face of emergencies is by guarded explanation, encouragement, and the opportunity to take part in suitable physical or social activities in competition or coöperation with others. In other words, the situation is *not satisfied* by an *examination* and a *diagnosis* — this situation calls for wise and active guidance in a program of training for the development of, and experience in, the ability to initiate and maintain *consistent effort* in study or in other activities. (Significantly enough in this connection, the Greek word for "effort" comes from the same root as the word "athlete".)

I am aware of the fact that studies along these lines are already being made in some institutions, but I am inclined to think that their importance is not *generally* recognized and that their value as a basis for the formulation of objectives and procedures in our work is not fully realized.

Here is a field of education generally unrecognized and neglected that is quite as important for the happiness and success of the individual as his intellectual attainments. Also, it is a field in which the doctor, the athletic coach, the leader of physical training and the student advisor can by teamwork and coöperation make a contribution to the training and development of the individual that will equip him for competition in a highly competitive society. Finally, there is the invaluable factor in the college situation that is composed of the combination of a stimulating new environment and a youth whose patterns of life, emotions, attitudes and behavior are still plastic.

Never again in the life of the individual will there appear an opportunity so favorable for the identification of personality difficulties and their modification by wise supervision and direction.

Nowhere is there such a multitude of hurdles for the well adjusted student to take in his stride, or for the less stable to balk at or stumble over. And, by the same token, no one so fortunate as the college doctor, who is in a position to observe the student from day to day in his reactions to these situations—and to judge whether or not his advice and the program being conducted by his associates in dealing with the case are proving effective.

No sensible person will attempt to tell another who is trained in a field of work how to run his job. So I make no attempt to discuss the details of an effort to coördinate the services of these two organizations in their attack on this problem. In the nature of things these will vary according to the types of cases recognized and the staff personalities involved.

I do, however, direct the attention of these two organizations to this educational problem of paramount importance and emphasize the necessity of coördinated effort for its solution.

No one else in the educational set-up has really recognized the situation or could deal with it objectively; and no other group is so favorably located and so well equipped as the members of these two groups before me to recognize these personality problems and to deal with them intelligently and effectively.

Paranasal Sinusitis*

Factors in Management and Prognosis

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THE management of an individual with paranasal sinusitis may consist of the correction of a single obvious factor or it may require a well planned medical or a technical surgical procedure. Sinusitis occurs in acute, subacute, or chronic forms which necessitate a thorough examination and careful evaluation of the problem so that a satisfactory outcome may be expected.

During the past two or three decades important contributions to the knowledge of anatomy, physiology, allergy and surgery have done much to clarify the question of management of a patient with sinusitis. Recent advances in the field of immunology and chemotherapy have materially aided in the care of the individual with the acute form.

Anatomy. The nose and paranasal sinuses cannot be practically dissociated. The middle turbinate, which is part of the ethmoid labyrinth, occupies a crucial position in the nasal cavity. Below the middle turbinate are the openings of the frontal, maxillary and anterior ethmoid sinuses; posteriorly and above are the ostia of the posterior ethmoid group. In close association is the sphenoidal sinus ostium. The nasal septum, which divides the nose into its two cavities, may be thickened, irregular, or deflected. Such irregularities by pressing on the middle turbinate may interfere with the ventilation and drainage of these sinuses on the obstructed side. In the upper jaw the molar and premolar teeth which may have roots extending into the maxillary sinus may be the cause of infection in that sinus.

Physiology. Certain aspects of nasal physiology are worthy of brief review to afford a clearer conception. The primary functions of the nose concern its ability in supplying moisture to the inspired air and the heating of it. The nose also serves as a filter for bacteria, pollen, and dust. It has been estimated that two quarts of water are given off by the nose in a 24-hour period. The nasal cavity is lined with ciliated columnar epithelium. The direction of the ciliary activity is downward and backward. The gradient of increasing activity is in these directions and also is found to be very active around the sinus ostia. The cilia are covered by a protective layer of mucus. Twenty-eight to 33°C. have been found to be the optimum temperature for ciliary activity. Drying increases the viscosity of this layer of mucus which results in a retardation of the ciliary activity. Chilling likewise diminishes the sweeping and cleansing functions. Certain drugs such as zinc, cocain, and adrenalin have deleterious effects on the movement of the cilia.

Allergy. Allergy of the nose is a complex clinical entity. The manifestations are both varied and variable. Allergy may manifest itself primarily in the nose or equally in the nose and sinuses. Unless the symptoms are severe or the individual is unusually solicitous about his nasal health, he will not likely be seen in the earliest stages. The presence of allergy in the nose may invite infection, and by the existence of allergy the infection which does occur may be, and often is, unduly prolonged.

Surgery. Amputation or partial removal of the inferior turbinate was formerly practiced. This procedure is seldom if ever resorted to at the present time by rhinologists. It has been shown, however, that removal of the middle turbinate may be done without too severely affecting the normal nasal physiology. Endonasal operations were formerly used almost exclusively for attacking all grades and locations of chronic sinus infection. The mutilating and deforming Killian operation which did much to cause condemnation of sinus surgery was done as a measure of last resort and often with results much to be desired. Today it is seldom necessary to do this procedure except in isolated instances. The combined external and internal approach of the ethmoids and associated sinuses with ligation of the ethmoidal and sphenopalatine arteries permits the operative field to be under direct view of the surgeon's eye. The incision is essentially the same as used for a dacryocystectomy. Tedious after-care and long hospitalization are eliminated. The employment of endonasal procedures should be confined for attacking isolated and well defined areas of sinus infection which can be safely and adequately managed by this method.

Immunology and chemotherapy. Immunology and chemotherapy have greatly aided in the care of a patient with acute fulminating sinusitis. Transfusions of whole blood have materially decreased the morbidity and mortality from this type of sinusitis. Sulfanilamide is of value in the pneumococcic and streptococcic varieties.

The etiology of sinusitis, irrespective of any other associated condition such as tumors, syphilis, tuberculosis, practically always has its inception by bacterial invasion. Trauma, injudicious therapy (medical or surgical) during an acute rhinitis and the acute exanthemata of childhood are the essential predisposing causes in acute sinusitis. Chronic sinusitis develops when there is faulty aeration and drainage from the sinuses and the natural protective mechanism of the body, both local and general, is interfered with. Dietary (vitamin) deficiencies, endocrine imbalances are likewise important.

Classification of Sinus Disease (non-allergic)*

A. Acute "the more acute the process, the more typical are the symptoms, and the simpler the diagnosis" —Lederer.
   1. Fulminating
      a. History of head cold, followed by swimming,

*From the division of otolaryngology and the Students' Health Service, University of Minnesota Medical School. Read before the Milwaukee Oto-ophthalmic Society, April, 1938.

*The classification given was used as a basis for management of the patients whose histories were reviewed in preparation for this paper.

trauma, or injudicious therapy.
b. Examination reveals an intensely sick individual with or without pain, swelling, associated with the involved sinus. High fever, toxicity, and intracranial complications present or imminent. Red nasal mucous membranes with sero-purulent exudate.
c. Roentgen ray shows involvement of suspected sinuses.

2. Surgical
a. History of head cold, swimming, or acute exanthemata.
b. Examination reveals an intensely sick individual but with complications not present. Resistance not adequate to cope with infection unless drainage of products of infection removed. Intranasal examination reveals swollen turbinates and purulent exudate filling nasal cavity.
c. Roentgen ray shows involvement of suspected sinuses.

3. Medical
a. History of acute upper respiratory infection which preceded sinus involvement. Pain and fever present; usually little or no external swelling. Intranasal examination reveals swollen turbinates and purulent exudate in meatus associated with the involved sinuses.
b. Roentgen ray shows involvement of sinuses.

B. Subacute

The findings in this stage are essentially the same as in the acute but to a much less degree. Undoubtedly many individuals have subacute sinusitis and spontaneously recover without consulting a physician.

C. Chronic
1. First degree:
a. History of frequency of head colds and few if any symptoms in interval between colds.
b. Examination reveals few if any intranasal findings. May have a deviated septum, a localized enlargement of middle turbinate, etc.
c. Roentgen ray shows usually negative findings or, if positive, confined to one and not over two sinuses.

2. Second degree:
a. History of continuous but slight symptoms.
b. Examination showing slight to moderate intranasal findings.
c. Roentgen ray shows involvement (definite but not marked) in at least one sinus; often present in two.

3. Third degree:
a. History of continuous and definite symptoms.
b. Examination reveals moderate to marked involvement of turbinate structures.
c. Roentgen ray shows moderate to marked involvement of two or more sinuses.
d. Those in whom previous management has given no relief or temporary relief.

4. Fourth degree:
a. History of continuous and marked symptoms.
b. Examination reveals marked intranasal findings (enlarged turbinates filling the nasal cavity and often covered with mucopus and crusts).
c. Roentgen ray shows involvement of all sinuses on one or both sides.
d. Those in whom previous management has had no effect.

Allergy may exist and its presence will, of course, alter the pathology accordingly.

General Comment

As was stated, the function of the nose is to warm and moisten the air and filter bacteria. When infection is present, either as an acute or chronic process, the indiscriminate use of vasoconstrictors to "drain and ventilate" the paranasal sinuses coincidently permits more air to pass through an already infected nasal cavity; this is not rational treatment if the patient is still allowed to breathe cold, or hot, or dry air. What would be said of our colleague, the cardiologist, who after making a diagnosis of myocarditis prescribed strychnine instead of digitalis and permitted his patient to climb stairs and play eighteen holes of golf? If more emphasis would be placed upon obtaining an environment of proper temperature and humidity, there would be less need for unnecessary use of vasoconstrictors.

As in any other organ of the body, all stages and grades of disease may be found in the nose and sinuses. The patient does not primarily consult us for relief of sinus disease but because of very definite and annoying symptoms which interfere with his health, often his wealth, and his pursuit of happiness. As specialists in rhinology we are supposed to search for, find, and correct the causes which interfere with his well-being.

A patient affected with sinus disease falls into one of two classes, either acute or chronic. If an acute process exists, pain, and symptoms associated with a sudden and abrupt cessation of nasal function exist. In chronic sinus disease there is usually an insidious retardation of nasal function and the symptoms are those referable to a gradual impairment. In other words, a candidate for any sinus infection may have subsisted on an inadequate diet, and he may have had one or more of acute exanthemata of childhood. Frequent and severe acute respiratory infections may be a factor. He may have suffered undue or prolonged expose during the height of an acute coryza. During this time he may have employed too much or too strong nasal oils or perhaps blown his nose too severely. He also may have had at some previous time an acute attack of sinusitis which was not recognized and was therefore inadequately managed. Deviations of the nasal septum and dental root infection in the upper jaw must likewise be kept in mind.

If an acute process is present, a sudden break of one or several links in the chain of the protective mechanism has occurred. If a chronic process exists there has been a gradual weakening of the various links. In either instance, impairment to cessation of functions is the result and not the cause of the trouble.

The duty of the rhinologist to the patient with acute sinusitis is to find those broken links as quickly as possible and reforge them. He should assist only in removing any over-accumulation of infection. The loss of function will automatically return. In one with a chronic process he must strengthen those weakened links which can be strengthened through one means or another. Some links such as age, locality and certain co-existing diseases can never be strengthened for obvious reasons. The disease process can often be removed which will materially add to the health of the patient.

In a normal healthy individual the chain of protective mechanism is sufficiently strong to withstand the development of sinus infection. If an acute infection of the sinuses does occur, however, it is due to a sudden introduction of a virulent organism as in a scarlet fever or influenza epidemic. Trauma, severe chilling, and exposure may likewise be responsible. In the chronic stages of the disease a gradual weakening of one or more links has occurred and an insidious increase in the amount of the disease are the important factors.

Factors in acute sinusitis. During the four-year period, 1934 to 1937, inclusive, in which a study of sinusitis was made there was a notable absence of patients with acute sinusitis who required surgical intervention. No patient who presented himself at the inception of the acute attack required surgical interference. The University of Minnesota Hospital is not a city-receiving hospital, yet during this time, as near as can be estimated, not less than four hundred patients with some form of acute sinusitis were seen either in the dispensary or in the Students' Health Service. Manipulative procedures such as infracting the middle turbinates and the surgical removal of obstructing bullar cells or anterior ends of middle turbinates, ephedrine-saline displacements, sodium chloride irrigations were not employed as a general rule. Only when the peak of the acute infection had been safely passed were a few of the more conservative measures resorted to. Rest, partial to absolute, depending upon the severity and progress of the infection, silver protein tampons, steam inhalations, and hot compresses, and nasal suction constituted the main forms of management. Throughout the entire period of acute sinusitis, the patient was cautioned not to blow the nose but to draw the secretion into the pharynx and then expectorate it.

In contrast to this group which was seen at the inception or early stage of the acute process is a group of eight patients who required surgical intervention. Of these, three died and five lived. Their histories are of interest.

CASE REPORTS

Case 1. R. P., male, aged 19, was admitted with a temperature of 103°F, pulse 160 and respiration 22. He complained of pain, redness, and swelling over the left forehead. Examination revealed a swelling which involved the left frontal and parietal area. A cellulitis of the periorbital tissues likewise existed. Purulent exudate filled the left nasal cavity. Further questioning revealed the edema had been present for 24 to 36 hours. The symptoms of acute sinusitis had developed several days previously after the individual had been swimming. Operation consisted of incision and drainage in the nasofrontal area. Death occurred within twelve hours from admission. Autopsy report: acute cerebral edema, thrombosis of the jugular bulb, bilateral purulent sinusitis, and edema of the scalp.

Case 2. E. M., male, aged 22, gave a history of swimming when he very likely had a head cold. Eleven days before admission the patient developed pain in chest and a cough with bloody expectoration. On admission there was edema of left forehead and the left eye was closed. The history also revealed irrigations and intra-nasal treatments. Operation consisted of simple incision and opening into frontal sinus at nasofrontal region. The opening revealed pus under pressure, osteomyelitis of posterior plate of frontal sinus and dura covered with infected granulation tissue. A brain abscess existed. This was opened and drained on four separate occasions. The patient ultimately died from multiple brain abscesses.

Case 3. G. A., female, aged 40, gave a history that six years ago she had had multiple dental extractions in the upper jaw. From that time she dated her nose and head trouble. A few days before admission she had a severe head cold and expectorated bloody sputum. When first seen, she was extremely ill and had complete blindness of her left eye. Examination showed a complete occlusion of the left nasal cavity with swelled turbinates and mucopus. A conservative external ethmosphenoidectomy was used because of the intense inflammatory reaction in the turbinates. It was done earlier than normal for two reasons: first, so that adequate drainage could be established as the patient was rapidly losing ground, and second, as an attempt to save the vision. However, the patient became progressively worse and died three weeks later. Autopsy showed multiple emboli and an old infarct of the lung.

In the five patients who lived, surgical treatment consisted of conservative drainage procedures in four. One of these had several small blood transfusions. Another patient had intranasal treatment which was directed to an old sphenoid infection. When the disease had reached a sub-acute stage, opening and drainage by an external ethmo-sphenoidectomy was done with prompt recovery.

In each of the patients who died there existed more pathology than that of acute sinusitis. In other words, the infection was so virulent and the individual's immunity so low that no resistance was offered to the process. Supportive measures, especially small blood transfusions as pointed out by Gill, would have been worthy of use earlier in the disease. The blood is given not so much for the red blood cell value but for the immune bodies which are introduced. Chemo-therapy, likewise, should have a definite place in the management. Sulfanilamide has been generally accepted for use in streptococcic infections. The important factors in the management of acute sinusitis are namely: (1) To avoid any procedure which may accentuate the infection. The body is endeavoring to resist and ultimately overcome the bacterial invasion. Any extensive surgical procedure may break down the barriers which are in the formative stage. This would in turn give impetus to the extension of the infection. A minor rhinological procedure done with impunity in a chronic stage may provoke a fatal extension of the infection if done on a patient who is in the throes of an acute sinusitis. (2) To supply the body with immune substances. There is a rapid drain of the protective substances in acute sinusitis. Conservation of them is enhanced by rest. Optimum temperature and humidity relations are important for this permits the nasal mechanism to relax normally. If

the infection is fulminating, one may know that the supply is unavailable or exhausted. Replacement is imperative. The use of small blood transfusions will do much to aid the patient. (3) To remove the products of infection only when over accumulated. The blood stream and natural sinus ostia can remove a considerable amount of the inflammatory debris. If the accumulation is too great and these avenues of escape are impaired, necessary drainage procedures, but conservative in type, are indicated.

CHRONIC SINUSITIS: FIRST AND SECOND DEGREE

Factors of temperature and humidity and relation of allergy. During the winter of 1937-1938 a group of twenty-two students in the Health Service of the University of Minnesota were studied by this writer. Their complaints were those of impaired nasal function, viz., nasal stuffiness, post-nasal discharge, and frequency of head colds during the winter months. All had roentgen ray studies, white blood counts with differential smears and sedimentation times. At least eight clinical examinations were made on each individual. In this group of twenty-two, ten were found to be allergic and twelve nonallergic. In the allergic group of ten, the post-nasal discharge varied from moderate to profuse. Eight had nasal stuffiness to obstruction. Five had negative roentgen rays of the sinuses. Of the remaining five, three had bilateral ethmoid and unilateral maxillary involvement. The other two had bilateral ethmoid and bilateral maxillary involvement. Without a single exception all studied in rooms with an inadequate means for humidification and therefore the humidity was at a minimum. All except one slept with the windows open during the winter months.

In the nonallergic group of twelve, the post-nasal discharge varied from moderate to profuse; nine had nasal stuffiness. Four had negative roentgen rays; four had early involvement of two or more sinuses which was not marked. All of the twelve had slept with their windows open in the previous winter months. However, two had discovered for themselves (the two with positive roentgen rays) that they were better with the windows closed while sleeping. All twelve had no means or minimal means for humidification and all studied in warm, dry rooms. As is to be expected, the four with no roentgen ray evidence of infection and the four with unilateral single sinus involvement received the most relief, yet the other four felt they had been distinctly benfited.

These twenty-two students were advised to keep their windows closed while sleeping which would eliminate to a certain degree the lower temperatures. They boiled at least one quart of water in their bedrooms every night so that they would be sure the humidity was relatively higher. In the four nonallergic patients with bilateral sinus involvement, mild silver protein and glycerine intranasal packs and suction was the only other treatment given at intervals.

The results may be summarized as follows:

In the allergic group, the improvement of symptoms could only be classified as slight; only one felt he had received definite improvement. Obviously then, even with atmospheric corrections, allergic management is a primary factor. In the nonallergic group, all felt that they had received from moderate to definite improvement. Four were completely relieved.

CHRONIC SINUSITIS: THIRD AND FOURTH DEGREE

A. *Factor of allergy.* There were seventeen patients who had allergy associated with chronic sinus disease of such nature and extent that in our opinion sinus surgery was indicated. The histories of all indicated they had allergy coexisting and undoubtedly preceding the sinusitis.

Of the seventeen, five also had bronchitis or bronchiectasis. Thorough exenteration of the disease process in the sinuses and treatment of the chest problem by iodized oil instillations together with allergic management, brought about improvement. Two of these who had asthma obtained variable relief. Two of the seventeen manifested no general symptoms of allergy. Thorough exenteration of all diseased tissue gave complete cures as evidence by several follow-up examinations.

Five patients had bronchial asthma associated with sinusitis. Four were improved and one was not. All had allergic management.

Three patients who had sinusitis apparently on a basis of food allergy were operated. The results were good in the one who adhered to his dietary restrictions. Two did not respond for follow-up examinations and treatment.

Of the remaining two, one had obesity and hypothyroidism. Sinus surgery, diet, and thyroid therapy improved her materially. One, a 69 year old woman, was miserable with complete nasal obstruction and postnasal discharge. Bilateral Caldwell-Luc operations and conservative intra-nasal ethmoid exenteration gave improvement.

Patients with advanced sinusitis and allergy require dual management. When a patient has sinusitis which is of both infective and allergic origin, that is, when it has reached the irreversible stage and a chronic infective pansinusitis of a third or fourth degree is present, thorough sinus surgery is indicated. Afterward allergic management must be continued if the patient is to forestall a repetition of the trouble.

B. *Factor of surgical anatomy.* In those patients with a third or fourth degree chronic sinusitis whose complaints are entirely referable to the nose and sinuses and no other disease exists, a good prognosis may be given. This can only be realized when the surgical anatomical problem is recognized and adequately managed. In other words, if the patient has developed a definite chronic pansinusitis or a localized chronic sinusitis of the frontoethmoidal or maxillary areas, adequate, clean, and thorough surgery is indicated. This should not convey the meaning of radical. Because of the intricate anatomy of the ethmoid labyrinth and its intimate association with the other sinus openings, it is held by many that it is not anatomically possible to do a complete endonasal procedure. Periorbital cells of the ethmoid, sphenoidal alcoves and recesses, and the coincident operative bleeding obviate completeness. It has been shown that residual

islands of mucous membrane may sometimes become seats of infection which can spread and subsequently give rise to surgical failure. Repeated endonasal procedures have not been uncommon due to the anatomical inaccessibility of these distal ethmoidal cells. The residual infected tissue is notorious in acting as a focal point in continuing the infection.

In a group of forty-six patients with infective, nonallergic sinusitis there were twelve in whom the surgical anatomical problem of the sinuses was a major one. There were: one patient with supraorbital fistula and unilateral pansinusitis; three patients with bilateral pansinusitis; two patients with maxillary sinusitis with dental fistula; five patients with unilateral pansinusitis; one patient with maxillary sinusitis.

In this group of patients the chief complaints were entirely referable to the nose, with the exception of those due to drainage from the frontal sinus or dental fistulae. The complaints dated from six months to a year, in the patients with a dental fistula. The others gave histories of nasal symptoms which were present continuously and becoming progressively worse over a period of from two to ten years. All the patients were managed surgically and the endeavor was made to correct those anatomical variations which might have prolonged the sinusitis. Each one of the twelve patients showed a clinical cure. Those with fistulae showed complete healing. The symptoms of nasal stuffiness or complete nasal obstruction, post-nasal discharge, and headache, rapidly subsided after surgery. Examination of the nasal cavities revealed a smooth moist mucous membrane without crusting.

In the nine patients with pansinusitis, there were extensive periorbital ethmoid cell extensions and in four deep sphenoidal alcoves which yielded to the external fronto-ethmoidal-sphenoidectomy. Intranasal surgical management would not have been feasible because of the inaccessibility of the sinus extensions by the intranasal route.

C. *Factor of sequelae.* If a diagnosis of sinus disease is made and to it is attributed the cause of another disease process, one must be guarded as to the amount of help which will be obtained if the sinuses are operated upon. If a too liberal prognosis is made and the other process is not or cannot be managed, sinus surgery will be deemed a failure by the patient, his family, and often his family physician. The rhinologist may still hold or maintain that infection has been eliminated from the nose and sinuses.

Five of the group of forty-six had chest involvement ranging from bronchitis to bronchiectasis. All had complete surgery on the involved sinuses. Two did not return for follow-up examinations. The three who did and who were subsequently treated with iodized oil instillations into the bronchi, showed definite improvement. Each had a gain in weight, diminished cough and a lessened amount of expectoration.

D. *Factor of associated disease.* If a patient can have adequate management of both the sinusitis and the other lesion or disease process, he will obviously improve. In a group of seven patients two had diabetes mellitus. Before surgical exenteration of the sinuses was attempted, the diabetes was treated by the department of internal medicine. Convalescence from surgery was uneventful. Three patients had dietary problems. One of the three who was definitely underweight and malnourished had extensive chronic sinusitis. Diet improved the general health to a moderate degree but had much more effect when the sinus infection had been eliminated. The remaining two had respectively, gastroenteritis and cholecystitis. Both were improved with internal medical help but more so after sinus surgery. If sinusitis had been considered as the sole etiology, undoubtedly no appreciable help would have been realized, even though surgical management had been thorough. There was one patient who had a hyperplastic and purulent sinusitis following an attack of scarlet fever, two years earlier. Conservative treatment gave only palliative relief. Bilateral external-fronto-ethmoidectomies were employed and rapid recovery ensued.

There were five patients in whom the sinus disease ante-dated a second but not obviously related problem. The subsequent problem became so great that although the nose and sinuses were essentially clean and clear postoperatively, no beneficial general effect could be considered to have been derived from the surgical management. These five patients had, respectively, arthritis and prostatitis, cirrhosis of the liver, neurasthenia (following an earlier removal of testicle) and two were emotionally unstable, as diagnosed by the department of neuro-psychiatry. These five patients were still sick, although it was felt they were improved or cured as far as the sinus infection was concerned.

E. *Disinclination.* There is that group of patients who have definite complaints and present clinical and roentgen ray evidence of sinusitis. A program of management, either medical or surgical, is outlined for them. For some reason they do not elect to continue their treatment which has just begun or has only partially been completed. They may present themselves months or years later at the same clinic or some other institution or office for care. Many of them are quick to condemn any help that was offered and will not coöperate. They feel that the sinusitis should be cleared up within a short time. Often another problem is present for which sufficient opportunity of study is not afforded. Little can be done for this group although this should not deter us from assisting those who will be helped.

Summary

An individual with any form of sinusitis can not be successfully managed unless a careful examination and an evaluation of the existing problem is made. A knowledge of the anatomy and physiology of the nose and paranasal sinuses is essential. Allergy should be considered as a possible factor. A patient with acute sinusitis should be treated conservatively, for the most part. In the early stages of chronic sinusitis, temperature, humidity, and allergy may be pertinent factors. Surgical anatomy plays an important role in those patients with chronic sinusitis who require surgery. Sequelae of sinusitis and coincidental disease may offer problems which demand especial care if the patient is to be materially benefited.

The Relationship of Physical Education to Health Service*

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IT is with some fear and trembling that I attempt to suggest new ideas or perhaps better, call attention to old ideas. It is only those with research ability, of which company I am not a part, who can really offer new ideas. In fact this is almost as difficult as appearing in the pulpit, which, I think, to most physical education men is akin to a bull in a china shop. To attempt to represent our physical education group in this joint meeting with the American Student Health Association one finds himself in a difficult position, regardless of how much he appreciates the honor. But speaking as one who may be called the captain of the second team, I am sure my fellow members would approve when I say our organization appreciates the opportunity and honor of this joint meeting. From this association we know that we cannot help but absorb valuable motives and ideas from you and we hope that you may at least learn to know us better and have more confidence in what we are trying to accomplish.

There are many varied relationships between the student health service and physical education in our colleges. In some, we find them organized under one department; in others, they are two separate departments with full time men in both departments; in others, they are linked with the local medical units. Regardless of the plan, a close coöperation between the health and physical education units is very necessary for the best results. Nowhere have I read or heard the proper relation stated better than Dr. Shailer Lawton has done in Nash's book, *Interpretations of Physical Education.* Although it will not be new to most of you, may I quote part of Dr. Lawton's Introduction on Nature and Scope of Health Examinations:

"The physical educator is eager to learn from medical science. Medicine and her handmaidens may learn from the new profession of physical education. These two professions are after all mutually dependent and interrelated in that they are both striving to bring life and that more abundantly, to the greatest possible number. The physical educator is working with groups and he applies his remedies through action. The physician works largely with individuals except in the field of public health. The physical educator is engaged in teaching young men and women to find themselves and to become better, more rounded and permanently mature adults, who, though age may overtake them, will never lose the buoyancy, flexibility and spontaneity of youth.

"The physician should aid the physical educator to recognize border-line disease states so that preventive measures may be taken when such can be the most effective. The physical educator, on the other hand, is eager to identify such conditions in order to turn them over to properly qualified medical authorities for appropriate treatment. The physical educator is not primarily interested in the therapy of disease. He desires to deal with the health machine. He must, therefore, know when such a machine is threatening to pass beyond his proper and chosen scope. The ones to teach him are properly experienced, trained and qualified physicians.

"The entire profession of physical education will be grateful to each and every one of the physicians who have here shared with us knowledge which both professions should have in common."

This seems to me to represent the ideal that should exist between physician and physical educationist. This requires an entire lack of any "high hat" point of view on the part of the physician, or an envious, jealous point of view on the part of the physical educator. They should both recognize that the other is really striving for the same thing, viz., more abundant life for the greatest number. The physician works through the medium of the individual; the physical educator through the medium of the group.

From the physical education directors' point of view, it seems to me that we must recognize in the medical field the better trained profession at the outset. A training of from seven to ten years puts them in a higher bracket than those who have had from four to eight years above the secondary school level. Quite often I believe that you will find men with great analytic ability who have not gone on with advanced training, because they have been called into service with, perhaps, a too meagre preparation. On the other hand, as in other phases of education and other professions you find medical men in positions on account of training rather than ability. In the final analysis, however, the physical educator is in the proper frame of mind if he recognizes the superior training of the medical man to make final decisions in individual cases. In fact, he should not feel an inferiority complex in this because our good physician recognized the possibility of a specialized opinion in a particular field.

A recent personal experience bears out this point. After one of the early football games in our college our football captain developed a disposition at times to headaches with accompanying nausea. At times he seemed to be absolutely normal. Our college physician found no symptoms from external examination, but insisted on a careful examination by a neurologist. Here a spinal fluid test showed increased fluid pressure with xanthochromic findings. On account of this indication of hemorrhage he was dropped from the squad and given a period of rest, which has resulted in an apparently complete recovery. If in individual cases our

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physicians appeal for higher opinions, the physical educator should not hesitate to do likewise without a feeling of inferiority.

Although we may take the position that our group approach is the better for society in general, we must recognize that in the matter of health the right of the individual is supreme. In this the physical educator must also recognize that most of our departments are too poorly manned to give the individual the attention that the physician demands. Our program *might* be set up so that we could give some of this individual attention demanded by the physician, but usually a lack of funds leaves our departments equipped only to meet the many group responsibilities and unable to do the individual service of which we are capable. A physical education program of general required physical education, intramurals, teacher training, and intercollegiate athletics does not leave much time for our small staffs to do individual corrective work. We give most of our time to the large group, while the physician is interested in assisting some to get back into this class after illness. In our zeal for our work, sometimes, I am sorry to admit, with the selfish motive to see a boy used on an athletic team we err in advancing our group idea at the entire expense of the right of the individual. No doubt this is too often the case; we neglect danger signals. Sometimes this is done knowingly, but for the most part it happens from a lack of proper consideration.

May I dare to call attention to the fact that some of us feel at times that the college physician is overly cautious in favor of the individual at the expense of the group. Even the physician is not always free from a possible truthful criticism of being selfish at times, particularly if he is a practicing physician. In my opinion mother love quite often works a serious hardship on a boy. I think that it could be proven that in the desire to keep some mothers sweet and friendly, physicians have certified to weaknesses in boys which exist only in the mother's mind. Modern life with its culture and inventions for modern comfort is tending to soften our race. An excuse for a boy to assist him in side-stepping active physical participation with a group is to weaken the boy socially as well as physically. I am sure that medical ethics often embarrass our college physician when he receives some such excuses from family physicians. I feel that one very much over-used excuse is in the matter of sinus difficulty in bathing and using the swimming pool. One would think to hear some of our local ear, eye, nose, and throat physicians' discussions that we never had any such difficulty before our swimming pool was built.

Thus, in many cases this relationship calls for the very close coöperation between the college physician and the teacher of physical education. I believe that the physical educator cannot know too much in some of the more common matters well understood by the physician. There is no reason why a physical educator should not have studied and continue to study in the fields of Physics, Physiology, Biology, Chemistry, Anatomy, Physiology of Exercise, Hygiene, Psychology and Sociology. From these studies he should learn to recognize certain difficulties which are to be referred to the physician; and he should gain an understanding of the medical point of view. On the other hand, I feel that physicians should be able to learn some things from the same knowledge concerning the physical educator's point of view. For example, it has been my experience that few physicians have given much attention to the mechanics of some of the joints, otherwise they would not apply adhesive tape in such hap-hazard, cover-all manners as I have seen them do many times. Have they not learned much in cases, such at Potts fracture, from the man who was desirous of returning the injured boy to the group drill as soon as possible?

To achieve this close coöperation is again a case of using our heads, as in the old limerick:

"We are born with two ends,
One to think with, the other to sit on,
Our success depends on which we use more,
A case of heads we win, tails we lose."

Tuberculosis in Nursemaids*

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WE recognize cases of active pulmonary tuberculosis as a distinct public menace. When these are found in the transient workers who are employed among us as domestics, they present an even greater danger because these people often obtain work as nursemaids and in that capacity come into immediate contact with those who are perhaps the least resistant to direct infection of this type. Two such cases have been referred to this office within the last few months by private patients who were intelligent enough parents to investigate the health of those they employed to care for their children in their own homes.

Case 1. May 4, 1939—A. C., white, female, age 22, presents an interesting background. Active pulmonary tuberculosis had been first diagnosed in 1932 when the patient was still at home. Her mother died of the same disease and had undoubtedly infected the daughter. The girl had "cured" at a sanatorium for six months and had been discharged only two months after her sputum became negative. She subsequently obtained work selling magazines which took her all over the United States. Recently she found employment in the house of a woman nine months pregnant for whom she planned to serve as nursemaid. Fortunately, she was sent in to her employer's physician for examination and was found to have pulmonary tuberculosis, moderately advanced (b) with positive sputum. She was then isolated in Minneapolis pending arrangements for her care in her home state.

Case 1.

Case 2.

Case 2. August 8, 1939—A. Z., white, female, age 22, was sent in to this office by her employer because she had a persistent, racking cough and the appearance of poor health. There was no family history of tuberculosis. The patient had been a nursemaid for a three months old child, eating and sleeping in the same room as the infant for eight weeks. The examination revealed the patient to be 25 pounds underweight and acutely ill with a temperature of 101.6 Fahrenheit. Unwittingly, she had served as a particularly dangerous source of infection through her uncontrolled coughing and raising while working in this household. The diagnosis read, pulmonary tuberculosis far advanced, bilateral with cavitation, and sputum positive for tubercle bacilli. This girl left town and the Minnesota Public Health Department was asked to follow up this open case.

These two case histories sharply point out the need for strict health standards among domestics and nursemaids. It is true that the educational campaign of the Hennepin County Tuberculosis Association has made many people sufficiently tuberculosis conscious to insist that their domestic help be free of disease but the individual physician himself must protect the families in his

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care, and through them the community, by urging physical examination of these employees.

Here lies an extremely valuable field of service in tuberculosis case-finding in which the family doctor should serve as key man. Repeated emphasis on this necessity of checking the health of employees should result in the earlier diagnosis of tuberculosis and in the prevention of exposure to infants and children from this source of infection. To this end, an annual health certificate declaring freedom from syphilis, gonorrhea and tuberculosis should be a requisite for the position of nursemaid.

Abscesses of the Neck*

With Case Reports

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ABSCESSES of the neck may have a stormy onset. Examples of this type are those developing from a peritonsillar abscess, infection of the lateral pharyngeal glands or Ludwig's angina. The diagnosis from such beginnings is not apt to be missed, as the discomfort of the patient keeps the possibility of complications constantly in the mind of the physician. The case which begins as a mild attack of tonsillitis or pharyngitis and apparently clears up, but the septic temperature, associated with chills, still persists, is much more likely to go undiagnosed than wrongly diagnosed. In any infection of the upper respiratory tract, the possibility of a complication directly from this area must be constantly kept in mind.

I have included in this discussion a partial report of the cases seen in the last ten years at the Quain and Ramstad Clinic. The total number of cases with their localization is as follows:

Floor of mouth—Ludwig's angina	11
Pharyngomaxillary space	9
Submaxillary fossa	32
Parotid gland	12
Tracts along the carotid sheath	3
Retropharyngeal space	7
Total number	74

Ludwig's Angina

Ludwig's angina may be located above or below the mylchyoid muscles. If above, it points in within the mouth and incisions should be made here; while if below, it points in the submental region and should be opened externally.

Abscesses located in the base of the tongue often rupture spontaneously from within or may be opened through the laryngoscope. These cases are very similar in type to the more serious cases of Ludwig's angina. Three cases, not included in this report, ruptured spontaneously while under treatment with hot compresses, awaiting the time when surgery would be indicated.

Pharyngomaxillary Space

The pharyngomaxillary space is bounded laterally by the parotid gland, ramus of the mandible and the internal pterygoid muscle with its strong fascia. The medial wall is formed by the superior constrictor muscle. The anterior boundary is the pterygomandibular raphe. The posterior wall is formed by the prevertebral muscles, the stylohyoid and the stylopharyngeus with their attachments to the styloid process. The roof and the floor are continuous with the carotid sheath space.

This space may be involved from a primary infection in the tonsils or pharynx. Three cases of abscess in the pharyngomaxillary space in this series were immediately preceded by a peritonsillar abscess. (Cases 1 and 2). As soon as the infection passes through the pharyngeal constrictor muscle, it becomes a pharyngomaxillary abscess. Inflammation in the parotid or submaxillary space not infrequently extends into the pharyngomaxillary space. Trismus is one of the most important early signs of involvement of this space. When this develops in the course of an upper respiratory infection or from infection in the parotid or submaxillary region, we must think of involvement of the pharyngomaxillary space. Swelling of the lateral pharyngeal wall appears early and is frequently overlooked as the swelling often does not show increased redness. It may also become infected following extraction of a tooth, especially a lower third molar. (Case 3).

Submaxillary Space

The submaxillary space may become infected in the following ways: (1) It may be infected from the mouth through the submaxillary duct. This infection is often associated with calculi in the duct. One patient with a submaxillary abscess which was drained externally passed a stone from the duct after returning home following

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his discharge from the hospital. No X-ray had been taken to determine the presence of a calculus. (2) It may be infected secondarily from infection of the lymph nodes contained in it. (3) Most of the abscesses in the submaxillary space are of dental origin, either from an abscessed tooth or following extraction. These cases, if not drained early, are apt to extend into the pharyngomaxillary space or around the carotid sheath. If sepsis continues after drainage of the abscess, the carotid sheath should be inspected immediately. If blood cultures are positive, ligation and resection of the internal jugular vein should be done at once. This should also be done if, in the absence of a positive blood culture, the sepsis continues.

Parotid Space Infection

The infection may begin as an acute inflammation of the gland, with a sudden onset of pain and swelling. These cases are nearly always secondary to injury, or following an operation.

Another group of cases are the result of inflammation extending up the duct, from occlusion of the duct due to a stone or other foreign material.

One case developed a swelling of the parotid gland three days after having this side of the face frozen. When seen ten days later, he had a parotid abscess. Following incision and drainage he made an uneventful recovery.

Tracts Along Carotid Sheath

Carotid sheath infection originates from infection in any or more than one of the other spaces, or from their contained lymph nodes. One of the cases reported developed from a submaxillary abscess, which, in turn, was of dental origin. All cases of infection in this area do not go on to thrombosis or septicemia. This is shown in Case 1.

Once the diagnosis of abscess is made, the probability that surgery may be necessary at any time must be kept constantly in mind. One cannot always wait for fluctuation to be apparent as the abscess may be so situated that fluctuation is a sign elicited too late, if at all, because the thick layers of deep cervical fascia are not readily broken through to admit it to the surface. A fatal septicemia, mediastinitis, or meningitis, may supervene. Therefore, the possibility of fluctuation may be only revealed at autopsy.

Too often the diagnosis is not made until the patient reaches the autopsy table, when a more complete study and earlier surgery might have saved the patient. Many of these cases die of a septicemia from infection of the internal jugular vein which went to autopsy unrecognized. The cavernous sinus may be involved by a retrograde thrombosis through the pterygoid plexus of veins.

Infection in the pharyngomaxillary, submaxillary and parotid spaces, as well as an abscess in the floor of the mouth or in the base of the tongue, can all be drained by Mosher's method of approach to deep pus in the neck. This gives the operator an excellent exposure and puts him in a position to adequately drain all of the infected spaces including the carotid sheath.

Retropharyngeal Space

Retropharyngeal abscess is, for the most part, a disease of infancy and childhood. (Case 5). It is seen in adult life in only a small percentage of the cases, because the retropharyngeal glands atrophy early in life. The cases found in adult life are usually due to trauma of the cervical vertebrae from external force or to a foreign body, such as a fishbone. Tuberculosis is also a cause of abscess in this location.

The most common etiological factor in children is an upper respiratory tract infection, tonsillitis, pharyngitis, cervical adenitis and sinusitis. It may be a complication of a suppurative otitis media or the exanthems.

The condition of the patient, especially in infants and children, is quite toxic. The abscess usually causes a fatal termination by an edema of the larynx, rupture of the abscess flooding the larynx and trachea with pus, or a generalized septicemia. The cause of death may be, but is less likely to be, due to a mediastinitis, a meningitis, cavernous sinus thrombosis or a brain abscess.

The breathing is more difficult, if the patient lies on the back. Consequently, the patient prefers to sit up or lean forward. This increased difficulty is, undoubtedly, due to the fact that the soft palate falls backward in the reclining position, thus further increasing the obstruction to respiration. An infant attempts to nurse with very little success, as it is unable to get sufficient air while nursing and the act of swallowing the milk causes extreme pain. If torticollis is present it will be toward the same side. When present, it causes the patient marked discomfort. External swelling of the neck may be of a very slight degree, often scarcely distinguishable, especially if torticollis is present. This condition is, in most cases, quite promptly relieved after the abscess has been successfully opened. (Cases 6 and 7).

A correct and early diagnosis is of utmost importance, and yet the condition is very often not recognized. It rarely happens that the patient arrives at the clinic or hospital with the diagnosis made by the referring physician. This is probably accounted for by the fact that several other conditions give the same symptoms that are found in a retropharyngeal abscess, such as dyspnea of varying degree, dysphagia, refusal of food, and regurgitation.

It must be differentiated from laryngeal obstruction, foreign body, diphtheria, enlarged thymus and other acute throat infections, digestive upsets or disease of the cervical spine, any of which may be the cause of difficulty in swallowing or refusal to take food.

A lateral roentgenogram should be made of the neck as this will clearly visualize the presence of the abscess and also show the extent of the involvement of the retropharyngeal space.

The abscess must not be opened prematurely before the abscess has localized. Before fluctuation is present, treatment should consist of hot irrigations and hot compresses to the neck. Care must be taken to guard against dehydration by the administration of intravenous fluid or hypodermoclysis.

The technic of opening the abscess is variable. Some advocate a general anesthetic, while other condemn its

use. Some advise incising the abscess with an ordinary scalpel, but never a pointed one; others advise a blunt forceps introduced into the abscess and withdrawn with the points spread. Still others advise a simple withdrawal of the pus by aspiration through a large caliber needle.

My experience with a general anesthetic is confined to two cases, both of which nearly ended fatally. The first was a girl two and one-half years of age who was rather hard to handle. Gas-oxygen was being administered and had scarcely gotten well under way when respiration suddenly ceased. An airway was immediately introduced and carbon dioxide and oxygen together with artificial respiration finally restored the breathing. The abscess was then incised with no further difficulty. The second case, a girl about the same age as the first, arrived a few weeks later. Thinking the difficulty in the first case might have been due to laryngeal obstruction, a child's Jackson laryngoscope and a bronchoscope were on the operating table. Gas-oxygen was again administered with a repetition of the experience encountered in the previous case. The laryngoscope was immediately introduced and the larynx was found entirely free of any sort of interference with the breathing. Artificial respiration was of no avail. The bronchoscope was quickly introduced and carbon dioxide and oxygen given through the bronchoscope. We were again fortunate in establishing normal breathing. The abscess was then opened. Both children made uneventful recoveries. After this sad experience with my first two cases of retropharyngeal abscess, I have never tried to use a general anesthetic.

The patient is wrapped tightly in a sheet and placed in the prone position and the table tipped so that the feet are at a considerably higher elevation than the head. With the head firmly held by an assistant, the tongue and epiglottis are elevated by a flat, curved, tongue depressor. This brings the abscess and larynx into direct view, and the larynx is seen to be at an elevation sufficiently above the abscess to make the aspiration of pus extremely unlikely. The abscess is then incised, the length of the incision depending upon the size of the abscess, and the contents removed by suction. If there has been no extension of the abscess into the other spaces, this should suffice for an uneventful recovery. Occasionally, the spread of infection makes it necessary to open the abscess externally.

Case Reports

Case No. 1. R. D., Male, age 43. About January 15, 1938, the patient was examined by his doctor, who made a diagnosis of peritonsillar abscess, right side. The physician did not think the abscess was ready to be opened and placed the patient on local treatment. Two days later the patient reported by telephone that he felt better and thought the abscess had ruptured. However, the swelling did not entirely disappear in the throat. The patient gradually developed swelling at the angle of the jaw on the right side. The doctor made an attempt to open the peritonsillar abscess, but obtained very little pus. Due to the marked difficulty in opening the mouth and the patient's septic condition, he was brought to the Clinic for examination and treatment.

Examination. The entire right side of the face was markedly swollen and very hard. The swelling extended from the parotid gland to well down below the angle of the jaw. The right tonsil was very large and was pushed almost across the throat due to peritonsillar infiltration. Patient had considerable difficulty in breathing due to the enlargement of the tonsil and the peritonsillar swelling. A diagnosis was made of peritonsillar abscess right and pharyngomaxillary abscess right. The patient gave no history of chills.

The patient was immediately hospitalized and a wide incision made into the peritonsillar area. However, there was very little pus obtained from this area. A blunt forceps was introduced through the incision into the pterygomaxillary fossa with evacuation of about 3 ounces of pus. Hot throat irrigations and hot compresses were applied to the neck.

On the following morning the swelling in the neck was about the same. There was some drainage in the throat, but this was not adequate. The abscess was opened externally and about 3 ounces of pus evacuated. The abscess was found to enter the submaxillary, parotid, pharyngomaxillary fossa and carotid sheath space. The carotid sheath was opened, but was apparently intact. A soft rubber tissue drain was inserted. This drain could be seen through the peritonsillar incision in the throat.

Blood culture was taken and was negative. Culture from the abscess showed this to be non-hemolytic streptococcus.

Following this the patient made an uneventful recovery. The patient was discharged from the hospital on February 21, to return home to his physician's care.

Case No. 2. A. H., Male, age 37. The patient was seen on February 20, 1936. The patient had had a sore throat for a week. This had improved somewhat and then had gotten worse on the left side. The patient was seen by his local doctor who incised a peritonsillar abscess on the left side. However, this gave him very little relief.

Examination. Some peritonsillar infiltration was present. This was incised with the discharge of a very small amount of pus. The following morning the patient was no better. The swelling in the pharynx was still quite marked, although the peritonsillar incision was well open.

Forceps were then introduced through the incision into the pterygomaxillary fossa. Upon withdrawal of the forceps, about 20 cc. of pus was evacuated. This gave him very prompt relief and he was discharged from the hospital two days later.

Case No. 3. S. K., Male, age 24. The patient was seen on November 1, 1938. Two weeks previously he had had an impacted left third molar removed. He had had considerable swelling and some drainage in this area ever since. He had marked difficulty in opening his mouth.

Examination. The left tonsil was very large and was pushed out to the midline of the pharynx, although there was no inflammation of the peritonsillar tissue. In the socket from which the tooth had been removed, there was some discharge of pus. When this was wiped away, pus reappeared on pressure made over the angle of the jaw.

A blunt forceps was then introduced along this tract. The blades were spread and withdrawn, enlarging the opening, and about 1 ounce of pus was released. Following this the patient felt much better and was able to open his mouth more easily. He was discharged from the hospital on November 6, 1938.

Case No. 4. Mrs. J. J., age 36. She was seen on January 14, 1935. The patient was sent into the Clinic on January 14, 1935, because of a hemorrhage following the opening of an abscess by her local physician. She thought she might have had scarlet fever because she had a severe sore throat about Christmas time and all of her children had scarlet fever.

At this time there was some swelling of the glands on the left side of the neck. Pain and swelling increased until she could hardly get her mouth open. On the morning of admission the doctor made an incision within the mouth which resulted in a profuse hemorrhage. He packed the incision which controlled the bleeding somewhat, and sent the patient immediately to the Clinic.

Examination. Temperature 101. Pulse 120. Respiration 20. Patient appeared very sick. Blood pressure 96/70. She could only open her mouth about one-half inch. There was no hemorrhage at the time she was seen here. There was marked

swelling and induration of the entire left side of the anterior cervical region.

She was sent immediately to the hospital and given a transfusion of 500 cc. of citrated blood. The following day she felt somewhat better. She had no further bleeding. The blood pressure rose to 110. Hot compresses were applied to the left side of the neck and face. She continued to show some improvement. She was able to open the mouth much better until the 18th when she again had some bleeding, although this was not severe. Packing was removed from the mouth and profuse bleeding immediately encountered. The external carotid artery was then ligated. The abscess was opened externally with evacuation of about 1½ ounces of pus.

On the following day her general condition seemed to be better. However, she developed a paralysis of the right side with some loss of speech. There was flaccid paralysis of the right arm with absence of reflex; knee kicks were absent on both sides; Babinski present; positive ankle clonus. She had a slight chill and with the presence of the paralysis, it was thought advisable to ligate and resect the internal jugular vein. Another 500 cc. of citrated blood was given intravenously.

Following this the patient seemed to show some improvement. Two days later she was able to move the right leg, but there was no movement in the arm. She was taking nourishment better and made some attempts to talk. At no time was there a positive blood culture obtained. She showed gradual improvement and had no further chills. Function in the arm and leg gradually returned. The discharge from the abscess gradually subsided. The speech was the last to show any signs of improvement. By the first of March she was able to talk fairly intelligibly.

On February 25 she developed some tenderness in the left thigh. It could not be determined at this time whether there was any bone or joint involvement. By March 1 this tenderness showed a definite localization in the upper and outer thirds of the left thigh. No bone or joint involvement present. The following morning this abscess was drained. She was discharged from the hospital on March 10. There was still some drainage from the leg. Her speech was practically normal. She had good use of her extremities.

Case No. 5. A. S., Male, age 10 months. He was seen on April 28, 1935. On April 23, 1935, swelling was noted in the left submaxillary region. It was also noted that the patient had a markedly sore throat with gradually increasing difficulty in breathing up to the time of examination. Recently he had had periods when he gasped for breath and became cyanotic. Patient was sent in with a diagnosis of quinsy, left side.

Examination. Marked swelling of the lateral pharyngeal wall left side which crowded the left tonsil well anteriorly and laterally.

Without any anesthetic the abscess was opened with evacuation of a large amount of pus. By evening the patient's general condition was very good. He was taking fluids very well. The pharynx was flat and the tonsil had returned to its normal position.

The patient was discharged from the hospital on the 30th. The pharynx had almost entirely healed up.

Case No. 6. Male, age 39. He was seen on March 10, 1937. Patient had had a sore throat for the past week, which gradually became worse. The patient reported that he had had quinsy fifteen years ago.

Examination. Some peritonsillar swelling on the right side. Uvula was quite edematous. It was thought that the abscess was not ready to be opened. Hot wet packs were applied to the right side of the neck and hot throat gargles given. Following this there was less swelling in the peritonsillar region, although the uvula was still markedly edematous and the patient felt no better. On the 12th the peritonsillar inflammation had almost entirely subsided, although the patient felt no better. The uvula was still quite edematous. A more complete search for the cause was made and a retropharyngeal abscess was found when the soft palate was retracted.

Incision of this gave immediate relief. He was discharged from the hospital two days later.

Case No. 7. Male, age 29. He was seen on December 22, 1938. The patient came in complaining of pain on swallowing and stiffness of the neck. On November 14, the patient was in an automobile accident and had injured his neck. He thought he had almost completely recovered from this and was again back at his usual occupation, when he noticed swelling beginning in the right side of the neck, high up under the angle of the jaw. He continued at his work as this did not bother him greatly at first. However, the swelling gradually became more marked and the difficulty in swallowing became greater. When he reported at the Clinic, he had marked torticollis and had definite pain on swallowing.

Examination. Throat, hypopharynx and postnasal space were reported as negative. There was some swelling of the glands below the angle of the jaw on the right side, but no tenderness on palpation. The only tender place on palpation was posterior to the sternocleidomastoid muscle. Due to the neck findings, it was thought that his trouble was, undoubtedly, in the cervical spine due to his injury. He was sent in for X-ray of the cervical spine and soft tissues of the neck. X-ray examination of the spine was negative, but X-ray of the soft tissues showed a retropharyngeal abscess on the right side. He was again examined and a swelling was noted in the right side of the nasopharynx. This extended down about to the level of the soft palate. This swelling was not marked and there was no change in the color of the membrane over the swelling.

The soft palate was retracted and a large caliber needle inserted upward and laterally. Thick pus was aspirated. He was then sent to the hospital and a retropharyngeal abscess opened. This gave him prompt relief, both from his dysphagia and the torticollis. He was discharged from the hospital two days later.

REFERENCE

1. Mosher, H. P.: Submaxillary fossa approach to deep pus in the neck, Tr. Am. Acad. Ophth. 34:19-36, 1929.

The
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ATMOSPHERIC POLLEN POLLUTION AND THE PUBLIC HEALTH

Public health concepts have extended considerably in recent years. Although public health activities originally were restricted to the control of the communicable diseases, at the present it appears to be generally recognized that it is the responsibility of those charged with the protection of the public health to control morbidity as well as mortality from *all causes* in so far as this is humanly possible. Activities designed to control the incidence and severity of diseases due to pollution of the atmosphere have not developed to the extent that these deserve. Large numbers develop susceptibility to the effects of air-borne pollen. The incidence of pollen disease among students at the University of Minnesota is about 5 per cent. Hay fever is the most common manifestation, but a majority of those who become allergic to pollen eventually develop bronchial asthma. The latter definitely reduces usefulness and shortens life expectancy. The most important sources of the disease-producing pollens are weeds which are allowed to propagate in neglected areas. And, so far as numbers of persons affected are concerned, the neglected areas within and adjacent to the larger centers of population are of greatest importance. Koessler and Durham reported that 38 per cent of the total area of Chicago was permitted to run to weeds, and this is probably fairly representative of American cities in general. Most cities have ordinances relating to weed control, but these are poorly enforced in most places.

The education of the public to the relationship of noxious weeds to health should result in having such weeds considered from a new point of view. Revision of ordinances for weed control to place the responsibility therefor directly upon public health officials and providing powers for effectual enforcement would go far in reducing the amount of atmospheric pollution by these noxious agents, and consequently the severity of the disease which these cause. It is not improbable that a reduction in the incidence of new cases would also be effected.

R. V. E.

SULFANILAMIDE IN TRACHOMA

When a new therapeutic agent of low toxicity is made available, it is promptly tried out, not only for those diseases for which it was intended but for a host of other ills. Often it is used, entirely empirically, on diseases far removed from those for which the drug was originally intended. Most often such attempts are barren. Occasionally, to the surprise of everyone, favorable results are obtained.

Such is the case with sulfanilamide. It is a well established fact that sulfanilamide was originally intended to be used against streptococci, its capacity being chiefly that of a bacteriostatic agent. Certainly when this information was set forth little if any thought was given to the greatest single cause of blindness—trachoma.

For years, trachoma has left its mark among the people of the world. It is so common in Egypt it has been named "Egyptian Ophthalmia." Much of the blindness found among American Indians can be traced directly to trachoma. For years treatment of this disease has been manifold, the only consistency lying in the poor results obtained.

With the introduction and wide use of sulfanilamide, in the course of events, it was tried on trachoma—a shot in the dark, one might say. The results were amazing. Lacrimation and photophobia promptly disappeared. Vision improved, pannus diminished and the sufferer could again see.

True, the patient with old chronic trachoma, whose vision was permanently impaired, could not be made to see better. Here the damage was done. Still he was promptly made more comfortable and his vision sustained at its present level.

From all over the world the literature was flooded with results of the use of sulfanilamide on trachoma—all consistently good.

Patients treated with sulfanilamide are given the drug by mouth, locally and preferably by both routes. In the University of Minnesota Eye Clinic such patients are given ambulatory treatment. This consists of sulfanilamide grains 40 per day by mouth supplemented by soda bicarbonate grains 20 to 40 per day. Hemoglobin and leucocyte counts are checked. A blood sulfanilamide level of five to ten mg. per cent is considered adequate. In addition, sulfanilamide is dusted in both cul-de-sacs. It is felt that by combining local with systemic use of the drug, results are more rapidly obtained.

It has been found here that the best results are obtained in two to three weeks. Often there is relief of symptoms in the first 24 to 48 hours. With the low concentrations of the drug used here, no untoward reactions have been seen.

Certainly the last word has not been said regarding sulfanilamide. If, in the final analysis, it proves of no value for anything else, its ability to relieve trachoma justifies all the work done on it. As yet it is too soon to make any definite documentation. However, if the results already obtained in the treatment of trachoma are sustained for a period of time sufficient to consider them permanent, trachoma will be eradicated.

FRANCIS M. WALSH.

AIR CONDITIONING

Air conditioning has become a growing modern industry. Refrigeration was first used to keep perishable foods from spoiling. It is now used in homes, offices, shops and stores, hospitals, operating rooms, and theaters. We frequently hear comments from those who experience a short or long stay in places so equipped. Some merely tell of their personal discomfort in changing from one atmosphere to the other, especially on coming out of air conditioned buildings. Apoplexy has been reported as occurring to persons shortly after they left air conditioned theaters.

The science of engineering is making rapid strides to correct any harmful effect of improper air conditioning. It was first thought that it was a matter of mere temperature reduction, but it has been found that the humidity plays a great factor; and to adjust this with the changing audiences has proved a difficult task.

The latent heat units become accumulative on the surface of the human body in the form of moisture when the humidity is high and evaporation cannot take place. Thus, humidity on the skin serves as a form of heat insulation. When the patron of an air conditioned theater is a woman, her lighter clothing removes, in a measure, this factor; while a man, who usually wears heavier apparel, retains this surface moisture and is in greater danger of apoplexy when he reaches the higher temperature of the atmosphere outside. Statistics show the frequency to be greater among men, which is doubtless explained by this difference in dress. The heat regulating mechanism in the back of the brain is no different in the two sexes.

We put refrigeration in theaters because we found it more comfortable, but we forgot that the people were in there for only a few hours. Only evaporation cooling can be effective cooling without harm. Engineers have been flirting with a relative humidity of 40 to 60 per cent, and the customary percentage has been nearer the higher mark. The opinion now among air conditioning engineers is that 40 per cent is better for the human system than the higher range.

A. E. H.

Future Meetings

62nd Annual Scientific Session
MEDICAL ASSOCIATION OF MONTANA
June 19-20, 1940
Hotel Baxter, Bozeman, Montana

MEDICAL ASSOCIATION OF MONTANA

President—Harold W. Gregg, M.D., Butte; President-elect—J. I. Wernham, M.D., Billings; Secretary—T. F. Walker, M.D., Great Falls; collaborating with the Program Committee: J. J. Malee, M.D., Anaconda; P. E. Kane, M.D., Butte; E. H. Lindstrom, M.D., Helena.

Councillors—S. A. Cooney, M.D., Helena; P. E. Kane, M.D., Butte; M. B. Hesdorffer, M.D., Missoula; L. G. Dunlap, M.D., Anaconda; R. D. Knapp, M.D., Wolf Point; L. T. Sussex, M.D., Havre; J. I. Wernham, M.D., Billings; A. D. Brewer, M.D., Bozeman; J. H. Garberson, M.D., Miles City; E. A. Weldon, M.D., Lewistown; E. D. Hitchcock, M.D., Great Falls; F. B. Ross, M.D., Kalispell.

Arrangements and details of meetings completed through the coöperation of the Gallatin County Medical Association.

President's Message

To the Medical Profession of Montana:

The Officers and the Council of the Montana State Medical Association want you to come to Bozeman for the Sixty-Second Annual Meeting. Never in the sixty-two years of its existence have so many grave problems faced our association and the medical profession as a whole. Remember that if you are a registered practitioner of medicine in Montana you are welcome, whether or not you belong to the State Medical Association. Also remember that if you are a member of the State Medical Association, whether or not you are a delegate, you have the privilege and duty of expressing yourself on the floor of the House of Delegates.

Our scientific program will be excellent. Our fellowship will be such as only Montana can know.

Come to Bozeman.

Harold W. Gregg, M.D.

Entertainment

Tuesday, June 18

1:30 P. M.—Meeting of House of Delegates.

8:00 P. M.—Doctors and their ladies will be entertained at a "Rodeo Smoker" at the Hotel Baxter.

Wednesday, June 19

Noon—Minnesota Alumni Luncheon at the Gallatin Gateway Inn.

Ladies' Tea and Bridge-Luncheons Wednesday and Thursday at the Gallatin Gateway Inn and Bozeman Country Club by the Gallatin Medical Society Auxiliary.

Scenic trips are scheduled for the ladies on Wednesday and Thursday.

Golf privileges extend to visiting doctors and their families at the Bozeman Country Club and the Valley View Golf Club.

Wednesday, June 19—7:00 P. M.—Banquet, Hotel Baxter (Main Dining Room). Principal address by L. LARSEN, M.D., Bismarck, North Dakota, president of the American Society of Clinical Pathologists, secretary of the North Dakota State Medical Association. Entertainment by "a glittering galaxy of Gallatin's Gorgeous Gals." Toastmaster: E. R. Grigg, M.D., Bozeman, Montana.

Speakers and Subjects

N. LOGAN LEVEN, M.D.

Clinical assistant professor of surgery, University of Minnesota; attending surgeon, Ancker Hospital, St. Paul; staff member, St. Luke's, Midway, Miller, St. Joseph's and Children's Hospitals.

Wednesday, 8:30 A. M.—"Problems in Biliary Tract Surgery."

Thursday, 11:00 A. M.—"Skin Transplantation."

WALTER A. FANSLER, M.D.

Clinical associate professor of surgery, University of Minnesota; associate surgeon in charge of division of proctology, Minneapolis General Hospital; consulting proctologist, Glen Lake Sanatorium; proctologist, Northwestern, Asbury, St. Barnabas, Abbott and St. Mary's Hospitals, Minneapolis.

Wednesday, 9:45 A. M.—"Diagnosis and Treatment of Carcinoma of Bowel."

Thursday, 3:00 P. M.—"Office Treatment of Anorectal Disease."

WILLIAM A. O'BRIEN, M.D.

Associate professor of pathology, preventive medicine and public health; director, Department of Postgraduate Medical Education, University of Minnesota.

Wednesday, 11:00 A. M.—"Cause and Prevention of Newborn and Premature Deaths."

Thursday, 2:00 P. M.—"Changes in Morbidity and Mortality Problems Incident to Aging of the Population."

CECIL J. WATSON, M.D.

Associate professor of medicine; director, Division of Internal Medicine, University of Minnesota.

Wednesday, 2:00 P. M.—"Treatment of Heart Failure."

Thursday, 8:30 A. M.—"Jaundice Considered From the Standpoint of Diagnosis and Pathologic Physiology."

ERNEST M. HAMMES, M.D.

Professor of nervous and mental diseases, University of Minnesota; chief, Neuropsychiatry Service, Ancker Hospital; consulting neuropsychiatrist, Gillette, St. Joseph, Miller, Mounds Park, St. Luke's and Midway Hospitals.

Wednesday, 3:00 P. M.—"Craniocerebral Injuries."

Thursday, 9:45 A. M.—"Modern Treatment of Psychiatric Disorders."

GREAT NORTHERN RAILWAY SURGEONS' ASSOCIATION

Preliminary Program

1940 Meeting at Davenport Hotel Spokane, Washington Friday and Saturday, June 28 and 29

"Treatment of Lacerations of the Hands and Face"—Dr. Thomas L. Hawkins, Helena, Montana.

"Fractures of the Fingers"—Dr. Ernest D. Lamb, Klamath Falls, Oregon.

"Gross Ocular Findings and Their Relation to Employment"—Dr. Carroll Smith, Spokane, Washington.

"Diagnosis and Treatment of Intracranial Hemorrhages Complicating Head Injuries" — Dr. J. W. Lynch, Spokane, Washington.

"Emergency Care and Transportation of Fractures of the Cervical Vertebrae and of the Dorsal and Lumbar Spine"—(Moving Pictures).

"Compression Fractures of the Spine"—Dr. H. E. Wheeler, Spokane, Washington.

"Protruded Intervertebral Discs"—Dr. E. A. Addington, Spokane, Washington.

"The Treatment of Burns"—Dr. H. W. Power, Conrad, Montana.

"Some Roentgenological Problems and Aids in the Surgery of Trauma"—Dr. R. G. Allison, Minneapolis, Minnesota.

"Traumatic Injuries to the Urinary Tract"—Dr. D. G. Corbett, Spokane, Washington.

"Sarcoma of the Tibia"—Dr. Fred F. Attix, Lewistown, Montana.

"Emergency Care and Transportation of Fractures of the Long Bones"—(Moving Pictures).

"A Treatment of Fractures of the Upper End of the Tibia Involving the Knee Joint"—Dr. R. C. Webb, Minneapolis, Minnesota.

"Treatment of Fracture of the Neck of the Femur"—Dr. Norman R. Brown, Spokane, Washington.

The Golf Tournament for the Association golf cup and other prizes will be held Friday afternoon, June 28, at the Spokane Country Club.

The annual Banquet will be held Friday evening at 7:30 P. M. at the Davenport Hotel, Spokane.

On Saturday afternoon at 2 P. M. there will be a specially conducted tour of the Grand Coulee Dam for members and visitors.

Members of the medical profession are invited to attend all meetings.

News Items

The North Dakota State Medical Association elected the following officers at the annual meeting held in Minot, May 6: Dr. C. J. Glaspel, Grafton, president; Dr. F. W. Fergusson, Kulm, president-elect; Dr. A. R. Sorenson, Minot, first vice-president; Dr. F. I. Darrow, Fargo, second vice-president; Dr. L. W. Larson, Bismarck, secretary; Dr. W. W. Wood, Jamestown, treasurer; Dr. A. P. Nachtwey, Dickinson, delegate to the A. M. A., 1941; Dr. C. E. Stackhouse, Bismarck, alternate delegate, 1941; Dr. J. H. Moore, Grand Forks, speaker of the House of Delegates. District medical society councillors (3 year term) are: Dr. W. C. Fawcett, Starkweather, District 2; Dr. P. G. Arzt, Jamestown, District 7; Dr. G. B. Ribble, LaMoure, District 8; Dr. A. E. Spar, Dickinson, District 10. Nominations to North Dakota Board of Medical Examiners: Dr. W. A. Gerrish, Jamestown; Dr. A. D. McCannel, Minot; Dr. W. A. Wright, Williston.

Dr. O. J. Mabee, of Mitchell, South Dakota, is the new president of the South Dakota State Medical Association, elected at the annual meeting May 21 in Watertown. Other officers are: Dr. B. M. Hart, Onida, president-elect; Dr. N. J. Nessa, Sioux Falls, vice-president; Dr. C. E. Sherwood, Madison, re-elected secretary and treasurer; Dr. S. M. Hohf, Yankton, chairman of the medical council. District medical society councilors re-elected include Dr. William Duncan, Webster, District 12; Dr. R. V. Overton, Winner, District 10; and Dr. J. L. Stewart, Nemo, District 9.

Dr. Russell W. Morse, Minneapolis, has been elected president of the Hennepin County Medical society to succeed Dr. James A. Johnson who will become chairman of the executive committee. Other officers are Dr. C. A. McKinlay, first vice-president, and Dr. Kenneth Phelps, second vice-president. Dr. James K. Anderson and Dr. Paul F. Dwan were named to the executive committee.

Dr. Hjalmar Mortensbak, of Hanska, Minnesota, is the new president of the Redwood-Brown medical society.

Dr. Charles A. Arneson, Bismarck, North Dakota, was elected president of the North Dakota Health Officers association at a conference in connection with the annual convention of the North Dakota State Medical Association. Dr. V. D. Ferguson of Edgeley was named vice-president and Dr. Maysil M. Williams of Bismarck was renamed secretary-treasurer.

Dr. C. P. Farnsworth, formerly of Chamberlain, South Dakota, is now practicing in Rapid City.

Dr. E. A. Hackie, formerly of Jamestown, North Dakota, is now practicing in Valley City. He has opened offices in the quarters of the late Dr. E. Q. Pray. Dr. Hackie has been a physician at the state hospital at Jamestown for the past two years.

Dr. W. T. Ferris of Chamberlain, South Dakota, has moved to Sterling, Illinois.

Dr. Royal C. Gray, assistant clinical professor of nervous and mental diseases at the University of Minnesota, has been elected a member of the American Psychiatric association. The announcement was made by Dr. C. C. Burlingame, chairman of the association's committee on public education.

Dr. J. A. Myers, professor of preventive medicine, University of Minnesota, gave several talks at the thirty-sixth annual meeting of the National Tuberculosis association at Cleveland, June 3.

Arrangements have been completed for the annual dinner of the Minnesota Medical Alumni Association at the American Medical Association meeting in New York City. Dr. Louis A. Hauser is the local chairman, assisted by Drs. Orville Chancellor, Ernest W. Lampe, John A. Time and L. S. Ylvisaker. The dinner will be held at six o'clock Wednesday evening, June 12th, at the Brauhaus Restaurant, 207 E. 54th Street, New York. The price of the dinner will be two dollars. Reservations may be sent to Dr. Hauser. The evening will be informal and the time has been set at six o'clock for the convenience of those who have other engagements later in the evening.

Dr. Charles E. McLennan of the department of obstetrics and gynecology, University of Minnesota Medical School, has been awarded a Fellowship by the Commonwealth Fund, for a year's study with Dr. E. M. Landis of the University of Virginia on problems concerning the toxemias of pregnancy.

Dr. Herman J. Holte, formerly of Seattle, Washington, is now practicing in Badger, Minnesota.

Dr. Reed M. Nesbit, head of the division of urology at the University of Michigan, will inaugurate the Franklyn R. Wright Lectureship on behalf of the Twin City Urological Society with a lecture on Hypertension in Unilateral Renal Disease. The lecture will be given at the University of Minnesota.

Dr. R. S. Ahrens has resigned his position as assistant superintendent of the Fergus Falls State hospital, Minnesota, and has joined the Lemley Clinic at Rapid City, South Dakota.

Dr. Albert I. Balmer has opened an office in Pipestone, Minnesota. Since last July he had been associated with Dr. E. F. McElmeel in that city.

The Michael Reese Hospital, Chicago, is offering a full-time intensive course in electrocardiography August 19 to August 31, 1940. Dr. Louis N. Katz, director of cardiovascular research, will conduct the course which is offered to the general practitioner. Further information may be obtained from the Cardiovascular Department of Michael Reese Hospital.

The 69th annual meeting of the American Public Health Association will be held in Detroit, Michigan, October 8-11, with the Book-Cadillac Hotel as headquarters. The Michigan Public Health Association, the American School Health Association, the International Society of Medical Health Officers, the Association of Women in Public Health, and a number of other allied and related organizations will meet in conjunction with the association. The Michigan committee on arrangements is headed by Mr. Abner Larned of Detroit. Dr. Henry F. Vaughan, health commissioner of Detroit, is executive secretary.

The old autopsy house where Osler worked at Blockley has been restored as the Osler Memorial Building, and will be dedicated on the grounds of the Philadelphia General Hospital, at Curie Avenue, near 34th and Pine Streets, Philadelphia, Pennsylvania, at 2:00 P. M. on June 8, 1940. Original furnishings, including the necropsy table, have been collected. The painting by Dean Cornwell, N.A., of New York, entitled "Osler at old Blockley," later to be hung in the building, will be on exhibition during the celebration.

There are facilities in the building for the housing and preservation of relics of old Blockley, as well as Osleriana. The committee would welcome any addition to this collection.

A cordial invitation is extended to those who are interested, and especially those who are planning to attend the American Medical Association Convention in New York City June 10th to 14th.

Plans for a Pan-American Congress of Ophthalmology to be held at the Hotel Cleveland, Cleveland, Ohio, October 11-12, have been announced. The congress will be sponsored by the American Academy of Ophthalmology and Otolaryngology, an organization of more than 2,500 specialists in diseases of the eye, ear, nose and throat, which will hold its annual convention immediately preceding the Pan-American gathering.

The congress is open to any ophthalmologist who wishes to register. Non-members of the Academy of Ophthalmology and Otolaryngology may register regardless of attendance at the Academy meeting proper.

ATTENTION SECRETARIES OF DISTRICT SOCIETIES

Space is at your disposal in The Journal-Lancet for advance notices and reports of meetings of your society and personal news items concerning members of your society. County and district secretaries are invited to forward such material to The Journal-Lancet, 84 S. 10th St., Minneapolis.

Necrology

Dr. Charles J. Plonske, 68, Faribault, Minnesota, died May 16, 1940. He had practiced in Faribault for 23 years and was president of the Rice County Medical society.

Dr. Kee Wakefield, 97, physician who practiced 50 years in Hutchinson, Minnesota, and later lived 19 years in Minneapolis, died May 8, 1940, at the home of his son in Ellendale, North Dakota.

Dr. F. F. Slyfield, 54, of Duluth, Minnesota, died May 2, 1940. Active in civic affairs, Dr. Slyfield had lived in Duluth since 1916.

Dr. Thomas Zeien, 77, Lindstrom, Minnesota, died April 8, 1940. Dr. Zeien had practiced in Lindstrom for 50 years.

Classified Advertisements

POSITION WANTED

Senior medical student from excellent school, out of school this year because of illness last fall wants work with physician. Ranking student, conscientious, hard-working. Prefer assisting with patients but can also do general office and lab work or research. Address Box 669, care of this office.

EXCEPTIONAL OPPORTUNITY

for beginning or established physician to share suite of offices with another physician or dentist. Individual treatment room or laboratory, in new office building located in very best residential retail section. Address Box 653, care this office.

PRACTICE FOR SALE

In western Minnesota, shopping center 5000 population. Either general or specialist. Address Box 670 care of this office.

POSITION WANTED

Experienced Kahler undergraduate nurse holding graduate's certificate Minneapolis General X-ray course. Two years college, 1½ years O.B. and other nursing. Can type, drive car, be receptionist. Address Box 676, care of this office.

FOR SALE

$7500 for an all-electric home—with attached apartment—the rent of which pays the tax and heating cost. This is a good location for a doctor—and can be bought on payment plan if desired. 3552 Colfax Avenue South. A. N. Bessessen, owner (retired M.D.).

EENT SPECIALIST WANTED

Well trained young man, preferably with eye, ear, nose and throat experience wanted. One who can take full charge of this specialty in a small, well established group. Exceptional opportunity for right man. North central city, 20,000 population. Address Box 678, care of this office.

NURSE AVAILABLE

Doctor's office nurse seeks position in busy office. Twelve years experience with one doctor. Qualified for simple laboratory and X-ray work, bookkeeping, typing, ether anesthetics for major surgery. Meets the public well. Will work in city or town. Address Box 677, care this office.

PHYSICIAN WANTED

Eye, ear, nose and throat man preferred, to join clinic group. Excellent building; congenial associates; in thriving retail district 10 min. from Minneapolis loop. Attractive air-conditioned suite; Kelly-Kett and dental X-ray with trained technician. Receptionist and phone attendant furnished. Completely equipped laboratory and operating room. Reasonable rental. References exchanged. Phone Main 0015 or address Box 672, care of this office.

Advertiser's Announcements

SQUIBB ENTERS BULK LAXATIVE FIELD

A palatable, flavored preparation of cleaned karaya gum granules has just been placed upon the market by E. R. Squibb & Sons, New York, under the name of Granaya. A companion product, Granaya with Cascara, is also available.

Gum karaya, like many vegetable gums, has the property of absorbing water, expanding to many times its original size and assuming a gelatinous consistency. It is said to be superior to both psyllium and agar in the amount of water it is capable of absorbing and the resulting gelatinous mass has most desirable physical properties in softening the intestinal mass which does not become gluey or rubbery.

Granaya is particularly useful in spastic and in other forms of chronic constipation. It is also useful pre- and postoperatively, and for constipation associated with such conditions as hemorrhoids or pregnancy. Physicians will find that by prescribing Granaya and giving instruction in proper diet and hygiene, normal elimination may be restored in many patients. In some patients, a single dose every second to seventh day will suffice. Where Granaya does not achieve the desired result, Granaya with Cascara is recommended.

Granaya offers a number of advantages in the treatment of chronic constipation. It is bland and harmless; it does not produce mucosal irritation. It is not habit forming. It is gentle in action and easy to take. It does not exert deleterious effect upon the absorption of food or fat-soluble vitamins. There is no leakage.

Squibb is supplying Granaya and Granaya with Cascara in bottles of 4 and 10 ounces and 1½ lb.

THE SUMMER-TIME USE OF MEAD'S OLEUM PERCOMORPHUM

During the hot weather, when fat tolerance is lowest, many physicians have found it a successful practice to transfer cod liver oil patients to Mead's Oleum Percomorphum.

Due to its negligible oil content and its small dosage, this product does not upset the digestion, so that even the most squeamish patient can "stomach" it without protest.

There are at least two facts that strongly indicate the reasonableness of the above suggestion: (1) In prematures, to whom cod liver oil cannot be given in sufficient dosage without serious digestive upset, Mead's Oleum Percomorphum is the antiricketic agent of choice. (2) In Florida, Arizona and New

Mexico, where an unusually high percentage of sunshine prevails at all seasons, Mead's Oleum Percomorphum continues increasingly in demand, as physicians realize that sunshine alone does not always prevent or cure rickets.

Mead Johnson & Company, Evansville, Indiana, invite you to send for samples of Mead's Oleum Percomorphum for clinical use during the summer months to replace cod liver oil.

MENIERE'S SYNDROME

A recent analysis of 186 cases of Meniere's syndrome (*J.A.M.A.*, 114:130, 1940) led to the conclusion that treatment by medical measures was of definite value. The review further suggests that reduction of the sodium content of the body by diet is helpful and that administration of potassium salts (potassium nitrate) offers additional relief. In another investigation (*J.A.M.A.*, 114:125, 1940) 48 patients were observed over eighteen months and all were treated with potassium chloride and a normal diet, without sodium restriction. Clinical improvement over the period of observation has been impressive. From 6 to 10 Gm. of potassium chloride were administered daily.

Both the chloride and the nitrate salts of potassium are available in "Enseals" (Enteric-Sealed Tablets, Lilly). This coating is a mixture of oils, waxes, and fatty acids, developed to permit "timed" disintegration and particularly well adapted to administration of chemicals which may conceivably be poorly tolerated in the stomach.

SURGICAL SUPPORTS TO ORDER

Mrs. Esther K. McDowell, formerly of the Krauter organization and now operating her own shop in the Meyers Arcade, Minneapolis, offers custom built supports for men, women and children. She has specialized in corsets for fifteen years, twelve years of that time having been devoted to the making of surgical garments in the Twin Cities.

A part of the service is the availability of an experienced designer on call for appointments with your patient at hospital or home.

The JOURNAL LANCET

Minneapolis, Minnesota
July, 1940

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Transactions of the South Dakota State Medical Association

Fifty-Ninth Annual Session
Watertown, South Dakota
May 20, 21, 22, 1940

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ANNUAL MEETING OF THE COUNCIL OF THE SOUTH DAKOTA STATE MEDICAL ASSOCIATION

First Meeting of the Council
Sunday, May 19, 1940—7:30 P. M.

The first meeting of the Council was called to order by Dr. S. M. Hohf, chairman, at the Lincoln Hotel at 7:30 P. M., Sunday, May 19, 1940. Roll Call: The following were present: Drs. J. C. Shirley, O. J. Mabee, B. M. Hart, C. E. Sherwood, W. A. Bates (seated for Aberdeen District No. 1 in place of J. D. Whiteside), W. G. Magee, D. S. Baughman, C. E. Robbins, G. E. Burman, J. H. Lloyd, W. E. Donahoe, S. M. Hohf, R. B. Fleeger, Wm. Duncan and J. F. D. Cook.

The minutes of the January 15, 1939, Council meeting were read and approved. Report of the Secretary and Treasurer was given and referred to the Auditing Committee for checking. The Committee on Arrangements presented the printed program as their report. Same was accepted. The Secretary reported that various items that he had been directed to take care of at the last Council meeting had been done.

At this time Mr. Cohen of the JOURNAL-LANCET appeared before the Council and brought greetings to the Association from the Editorial Board. He suggested that the Association use the JOURNAL-LANCET more and that some man from the profession in South Dakota be selected to edit a special issue of the JOURNAL-LANCET in the near future similar to that edited by the Montana Association this last year. He also suggested that much of the material transmitted to the members by the Secretary through news bulletins might be printed in the JOURNAL-LANCET. General discussion ensued and Dr. Shirley moved that the JOURNAL-LANCET be used more in the future in transmitting information to the profession. This motion was seconded by Dr. Robbins and after general discussion, was passed. Dr. S. M. Hohf suggested that it might be of interest if we endeavored to get more South Dakota news in the American Medical Association *Journal*.

Dr. Duncan suggested that under new business we should think along the line of support of candidates for the legislature who had been of assistance to us during session the last year. Dr. Hohf discussed the possibility of legislation to make post mortem examinations more readily available. After general discussion by the Council, no action was taken.

The Secretary presented a bill of $27.50 for mileage. Moved by Dr. Robbins, seconded by Dr. Magee that it be allowed. *Motion carried.*

The chairman appointed the Auditing Committee as follows: Drs. Baughman, Lloyd and Donahoe.

There being no further business, the meeting was adjourned.

C. E. SHERWOOD, M.D.,
Secretary-Treasurer.

Report of Secretary-Treasurer

Your secretary has endeavored to keep the membership acquainted with the work of the State Association. To that end, periodic mimeographed News Bulletins have been published and mailed. There have been eight bulletins sent out, containing excerpts of principal actions of the Council and other news items of interest to the profession at large.

A voucher system for presentation of bills against the Association has been installed, as well as a duplicate remittance blank for the district secretaries. The Constitution and By-laws of the Association was edited and a new and up-to-date edition was published and a copy mailed with one of the news bulletins to every member.

A radio broadcast of medical topics was started the first Sunday in November and has continued each subsequent Sunday. Your secretary has for the most part had fine coöperation from the membership in procuring these papers, only occasionally has he had to prepare a paper at the last minute for presentation.

A rather persistent and energetic attempt on the part of the officers of the Association, by correspondence with district society officers and through means of the bulletin to the profession at large, has met with a rather good response as far as membership is concerned.

The following is an analysis of membership by districts with a comparison to last year's figures:

	May 18, 1939	May 18, 1940	Dec. 31, 1939	*Honorary* May 18, 1940
District 1	34	35	36	1
District 2	22	19	24	2
District 3	22	23	24	2
District 4	12	15	14	---
District 5	14	16	14	1
District 6	22	23	28	4
District 7	44	50	53	3
District 8	32	35	38	2
District 9	34	52	53	21
District 10	6	6	6	---
District 11	8	9	8	---
District 12	10	16	15	---
Totals	260	299	313	36

Number of Physicians Deceased	12
Number of Physicians in State	500
Number of Physicians in State (V.A., C.C.C., etc.)	41

South Dakota State Medical Association
Financial Statement
May 18, 1940

Receipts—		
Balance on hand April 22, 1939	$2,346.19	
Back Dues (1939 Dues, 82 members)	820.00	
1940 Dues (299 members)	2,990.00	
Miscellaneous Receipts	3.00	
Float	.10	
Total		$6,159.29
Disbursements—		
Alonzo Ward Hotel (guests)	$ 66.68	
Alonzo Ward Hotel (banquet)	29.87	
Railroad expense (speakers)	349.85	
Journal-Lancet	499.13	
A. M. A. Delegate	75.00	
Salary, Secretary-Treasurer	1,100.00	
Retainer, Attorney Goldsmith	225.45	
Expense, Travel, Secretary	9.04	
Printing and Supplies	238.45	
Telephone	47.67	
Postage	131.35	
Badges	16.15	
Bond	5.00	
Council dinners	31.84	
Council mileage	326.90	
Refund	8.50	
Flowers	5.15	
Miscellaneous convention expense	11.26	
Float	.70	
Total		$3,177.99
Balance on hand May 18, 1940		$2,981.30

Legislative Fund

Receipts—		
Balance on hand April 22, 1939	$ 530.71	
6/24/39 Third District	15.00	
3/30/40 Interest	6.15	
5/1/40 Watertown District	48.80	
5/6/40 Watertown District	12.00	
Total		$612.66
Disbursements—		
5/23/39 D. S. Baughman (telephone)	$ 2.20	
Balance on Hand, Savings Account, May 18, 1940		$610.46

Second Meeting of the Council
Tuesday, May 21, 1940

The meeting was called to order by Chairman Hohf. Those present were Drs. J. C. Shirley, O. J. Mabee, B. M. Hart, W. G. Magee, D. S. Baughman, C. E. Robbins, G. E. Burman, W. E. Donahoe, S. M. Hohf, R. B. Fleeger, Wm. Duncan, J. F. D. Cook. Attorney Karl Goldsmith was also present.

The minutes of the previous meeting were read and approved. The auditing committee presented their report. It was moved by Dr. Baughman, supported by Dr. Hart that this report be approved. *Motion carried.*

Dr. Baughman discussed autopsy and sending of bodies to the State Medical School. General discussion ensued. Mr. Goldsmith was directed to check up on the law and inform the Council as to the present status.

General discussion on matters of coöperation between the medical profession and the Christmas Seal organization was held and the chairman appointed Dr. Baughman, Dr. Duncan and Dr. Cook as a committee to present this to the House of Delegates at the meeting to be held in the afternoon, May 21, 1940. The meeting adjourned to meet again tomorrow morning at 8:30 for a short session.

C. E. Sherwood, M.D.,
Secretary-Treasurer.

Third Meeting of the Council
Wednesday, May 22, 1940

The third meeting of the Council was called to order by Chairman Hohf at the Lincoln Hotel at 8:30 A. M., Wednesday, May 22, 1940.

Roll call: The following were present: W. A. Bates, D. S. Baughman, C. E. Robbins, G. E. Burman, S. M. Hohf, R. B. Fleeger, J. F. D. Cook, N. J. Nessa, J. C. Shirley, O. J. Mabee, B. M. Hart and C. E. Sherwood.

The minutes of the previous meeting were read and approved.

Nominations for chairman were declared in order. The motion was made by Dr. Cook, seconded by Dr. Hart that Dr. Hohf be nominated. *Motion carried.* Dr. Baughman moved that the nominations cease and that the Secretary be instructed to cast a unanimous ballot for Dr. Hohf. *Motion was seconded by Dr. Burman and carried.*

The next vote to be taken was for secretary-treasurer for a three-year term. Moved by Dr. Baughman, supported by Dr. Burman that Dr. C. E. Sherwood be elected for the three-year term. *Motion carried.*

The amount of salary to be paid the secretary-treasurer was discussed and it was moved by Dr. Mabee, seconded by Dr. Fleeger that the secretary's salary remain the same. *Motion carried.*

After a short general discussion, the meeting adjourned.

C. E. Sherwood, M.D.,
Secretary-Treasurer.

HOUSE OF DELEGATES, SOUTH DAKOTA STATE MEDICAL ASSOCIATION

First Meeting

Watertown, South Dakota, May 20, 1940

The first meeting of the House of Delegates was held at 7:00 P. M. in the Lincoln Hotel at Watertown, South Dakota, May 20, 1940. President J. C. Shirley presided, Dr. C. E. Sherwood, secretary.

Roll call: Drs. J. C. Shirley, C. E. Sherwood, O. J. Mabee, B. M. Hart, W. A. Bates, J. E. Bruner, W. G. Magee, H. R. Brown, D. S. Baughman, G. E. Whitson, C. E. Robbins, T. F. Riggs, G. E. Burman, M. W. Pangburn, J. H Lloyd, B. A. Bobb, W. E. Donahoe, L. J. Pankow, S. M. Hohf, F. W. Haas, J. W. Bushnell, R. B. Fleeger, F. S. Howe, Wm. Duncan, D. A. Gregory, Lyle Hare, A. S. Rider (sitting in for E. G. Erickson) and A. Triolo (sitting in for J. C. Threadgold). Quorum present.

The secretary presented the minutes of the 1939 meeting as printed in the July 1939 issue of the JOURNAL-LANCET. Dr. S. M. Hohf moved that the minutes of the 1939 meeting be approved as printed in the JOURNAL-LANCET. *Motion seconded by B. A. Bobb and passed.*

The report of the Secretary-Treasurer was presented for approval of the House. It was moved by Dr. Gregory, seconded by Dr. Whitson that the Secretary-Treasurer's report be referred to the proper committee. *Motion carried.*

At this time Dr. J. C. Shirley, president of the State Medical Association, gave his address, which was referred to the proper committee.

Dr. Pankow raised the question as to what was to be done with the $20,000 which was left after the Farmer's Aid Corporation was abolished. General discussion ensued.

Dr. J. C. Shirley presented Mrs. A. E. Johnson, president of the Women's Auxiliary to the South Dakota State Medical Association. Mrs. Johnson gave a short talk in which she mentioned the plan for a benevolent fund and assured the Medical Association of the Auxiliary's desire to aid and assist the association in any way in which they could. She introduced Mrs. F. C. Nilsson who explained more fully the benevolent fund program and listed various ways in which the ladies have assisted the program of the Medical Association. She also expressed their desire and willingness to cooperate in any way possible in programs of the association. The matter was referred to the proper committee.

Reference committees were appointed by the President as follows: Reports of Officers: Drs. Baughman, Robbins and Lowe.. Resolutions and Memorials: Drs. Pangburn, Cook, Auld. Amendments to Constitution and By-Laws: Drs. Whiteside, Howe, Fleeger, Lloyd, Bobb. Nominations and Place of Meeting: Drs. Duncan, Burman, Rudolph, Brown, Whitson, Riggs, Bobb, Pankow, Haas, Fleeger, Quinn, Lowe. Credentials: Drs. Donahoe, Overton, Murdy.

Reports of the standing and special committees were given.

Commitee on Scientific Work. The report as submitted by J. C. Shirley was read by C. E. Sherwood and referred to the proper committee.

Committee on Public Policy and Legislation. Report read by C. E. Sherwood and referred to the proper committee.

Committee on Publications. Report read by C. E. Sherwood and referred to the proper committee.

Committee on Necrology. The report of deceased members was read by the secretary and referred to the proper committee.

Committee on Medical Defense. Report read by Dr. Pankow and referred to the proper committee. This report entailed an amendment to the By Laws of the association and was presented for the first time at this meeting as required by the By-Laws.

Committee on Medical Education and Hospitals. No report.

Committee on Medical Economics. Report read by Dr. Sherwood and referred to the proper committee.

Committee on Public Health. Report presented by Dr. Baughman, chairman, and referred to the proper committee.

Dr. Jones gave an impromptu talk regarding the tuberculosis problem which was presented in the report of the Committee on Public Health, read by Dr. Baughman, and it was his suggestion that the committee on Public Health make recommendations looking toward the providing of a place for the care of the tuberculosis cases which are a menace to the community at large, incurable and ineligible for care at Sanator.

Committee on Radio Broadcasting. Report read by Dr. Hohf and referred to the proper committee. In connection with this report Dr. Duncan offered some suggestions and brought up the question of whether or not the association was presenting the type of program the public wanted.

Editorial Committee. No report.

Committee on Medical Licensure. No report.

Committee Advisory Women's Auxiliary. This report was included in the report by the committee from the Ladies' Auxiliary and it was their suggestion that the Reference Committee give very serious consideration to the material presented by the ladies.

Allied Group Committee. No report.

Committee on Military Affairs. Report read by Dr. Sherwood and referred to the proper committee.

Committee on Radiology. No report.

Committee on Postgraduate Course. Report read by Dr. Sherwood and referred to the proper committee.

Committee on Spafford Memorial Fund. Report of this committee was the same as last year, no additional award having been made.

Committee on Army Medical Library and Museum. Read by Dr. Sherwood and referred to the proper committee.

Committee on Ophthalmology and Otolaryngology. Read by Dr. Sherwood and referred to the proper committee.

Committee on Orthopedics. Dr. Sherwood read the report as submitted by Dr. Van Demark, chairman, and referred to the proper committee.

Committee on Social Security. No report.

Amendments to the Constitution were presented. The proper method of voting was also brought up. Dr. Pankow moved that the vote be taken by roll call. The motion was seconded by Dr. Brown. Discussion ensued and a standing vote on the matter was taken. The results of the vote were: 9 in favor of voting by roll call; 11 in favor of voting by ballot. Dr. Duncan and Dr. Gregory were appointed tellers. Dr. Duncan explained the purpose of this amendment to the Constitution and a general discussion was held. A vote was taken by ballot with the following results: To adopt the amendment, 9; against the amendment, 18. The amendment was defeated.

Dr. J. C. Shirley stated that Mr. Carlson, state compensation officer of the Works Progress Administration, had asked that a committee be appointed to check the distribution of the WPA injured employees. Dr. Shirley suggested that the House of Delegates pass a resolution commending Mr. Carlson of the WPA for allowing choice of physician to the injured employee. Motion made by Dr. Cook and seconded by Dr. Riggs that such a resolution be adopted. *Motion carried.*

Dr. Shirley requested that Dr. Grosvenor of Huron be accepted as an honorary member of the State Medical Association. Dr. Sherwood read the following list of honorary members as voted by the respective district societies.

Dr. M. J. Hammond, Watertown—2nd District.
Dr. C. A. Butler, Lake Preston—3rd District.
Dr. L. N. Grosvenor, Huron—5th District.
Dr. E. M. Young, Mitchell—6th District.
Dr. R. H. Nyquist, Fort Meade—9th District.
Dr. R. W. Homan, Fort Meade—9th District.
Dr. W. M. Robertson, Custer—9th District.
Dr. David Migdoll, Rouboix—9th District.
Dr. W. B. Rogers, Custer—9th District.
Dr. P. V. Ketchum, Rouboix—9th District
Dr. H R. Hill, Custer—9th District.
Dr. Martin Rudoy, Custer—9th District.
Dr. C. E. Yates, Fruitdale—9th District.
Dr. Samuel Schultz, Hot Springs—9th District.
Dr. Carl E. Sixbury, Blue Belle—9th District.
Dr. E. B. Kenner, Deadwood—9th District.
Dr. E. A. Welch, Hot Springs—9th District.
Dr. P. C. Christen, Hot Springs—9th District.
Dr. F. J. Roberts, Hot Springs—9th District.
Dr. L. L. Cramer, Hot Springs—9th District.
Dr. A. L. Stubbs, Hot Springs—9th District.
Dr. R. D. Roadruck, Hot Springs—9th District.
Dr. T. G. Scott, Hot Springs—9th District.

Dr. J. A. Shearer, Hot Springs—9th District.

Dr. Eugene Mattice, Hot Springs—9th District.

Motion made by Dr. Mabee seconded by Dr. Lloyd that these men be accepted as honorary members. *Motion carried.*

Pneumonia program was brought up by Dr. Baughman and a very short discussion was held.

The meeting adjourned.

C. E. Sherwood, M.D.,
Secretary-Treasurer.

Second Meeting of the House of Delegates
May 21, 1940

The second meeting of the House of Delegates was held at 4:30 P. M. May 21, 1940, at the Lincoln Hotel, Dr. J. C. Shirley presiding, Dr. C. E. Sherwood, secretary.

Roll Call: E. A. Rudolph, W. A. Bates, J. E. Bruner, W. G. Magee, H. R. Brown, G. E. Whitson, C. E. Robbins, T. F. Riggs, G. E. Burman, M. W. Pangburn, J. H. Lloyd, B. A. Bobb, L. J. Pankow, E. G. Erickson, S. M. Hohf, John Bushnell, R. B. Fleeger, F. S. Howe, A. Triolo, D. A. Gregory, J. C. Shirley, C. E. Sherwood, O. J. Mabee, B. M. Hart, J. F. D. Cook, and D. S. Baugman present.

The minutes of the previous meeting were read by the Secretary. Motion made by Dr. Lloyd and seconded by Dr. Riggs that the minutes be approved as read. *Motion carried.*

Dr. Shirley requested that Dr. Sherwood send a copy of the resolution relative to the distribution of WPA injured employees, to Mr. Carlson of the Works Progress Administration.

Dr. O. J. Mabee, president-elect, gave a short address at this time. It was moved by Dr. Bobb, supported by Dr. Bates, that Dr. Mabee's entire address not be read since time was limited, but that it be published in the Journal-Lancet as written. *Motion carried.* The suggestions offered by Dr. Mabee in his address were referred to the Council for further consideration.

Election of officers and place of meeting: The following nominations were given by the Committee on Nominations.

President-elect: W. A. Bates and B. M. Hart; vice-president: N. J. Nessa and F. S. Howe; councilor Black Hills District No. 9, 1940-43: J. L. Stewart; councilor Rosebud District No. 10, 1940-43: R. V. Overton; councilor Whetstone Valley District No. 12, 1940-43: Wm. Duncan; delegate to A. M. A. annual sessions, 1941-42: J. R. Westaby; alternate delegate: J. C. Shirley; place of meeting, 1941: Mitchell.

Dr. Whitson and Dr. Burman were appointed by Dr. Shirley to act as tellers. A ballot was taken with the following results:

President-elect: B. M. Hart; vice-president: N. J. Nessa; councilor Black Hills District No. 9, 1940-43: J. L. Stewart; councilor Rosebud district No. 10, 1940-43: R. B. Overton; councilor Whetstone Valley District No. 12, 1940-43: Wm. Duncan; delegate to A. M. A. annual sessions, 1941-42: J. R. Westaby; alternate delegate: J. C. Shirley; place of meeting, 1941: Mitchell.

The reports of the reference committees were given. Dr. Pangburn submits the following report of his committee: Resolutions and Memorials.

That the report of the Postgraduate Course Committee is approved.

That the report of the Committee on Radio Broadcasts as presented by Chairman Hohf is hereby approved.

That the report of the Committee on Military Affairs as submitted by Chairman Kenny is approved.

That the report of the Committee on Ophthalmology and Otolaryngology is hereby approved.

That the report of the Committee on Orthopedics, submitted by Chairman G. E. Van Demark is approved.

That the report of the Committee on Army Medical Library and Museum is hereby approved.

That the report of the Committee on Necrology be approved. Further, this committee suggests that the Secretary be directed to write a letter of condolence to the wife of deceased members or to the member should he lose his wife. This matter was discussed by the House and it was moved by Dr. Hohf that the Secretary have the district societies inform him of the death of any member or his wife, as soon as possible and that a note of sympathy be sent in the name of the association. *Motion seconded by Dr. Bates and carried.*

On the Women's Auxiliary Advisory Committee the reference committee wishes to recommend that one dollar of the annual dues of each member be placed in the benevolent fund. Discussion ensued and the motion was made by Dr. Pankow, seconded by Dr. Bobb that a committee be appointed to consider and work out a permanent set-up to be presented at next year's meeting. *Motion carried.* After considerable discussion it was voted that the amount to be placed in the benevolent fund for this year be $.50 per member. The committee also wish to commend the ladies for establishing the benevolent fund.

The motion was made by Dr. Pankow and seconded by Dr. Bates that the reports of this committee be approved. *Motion carried.*

Dr. Cook presented the report of the committee, on the report submitted by the Committee on Public Health. It was the suggestion of the committee that the report of the Committee on Public Health be studied. Further, that the recommendations contained in this report be studied more in detail and that it be referred to the Council for further action. It was moved by Dr. Cook, seconded by Dr. Pankow, that the report of the Committee on Public Health be approved, and referred to the Council for further action. *Motion carried.*

The report of the Committee on Medical Economics was discussed by Karl Goldsmith insofar as the legal aspects were concerned. Motion made by Dr. Cook and seconded by Dr. Whitson that the report on medical economics be approved and filed but not published. *Motion carried.*

Dr. Bates presented the report of the Committee on Amendments to the Constitution and By-Laws, as follows: The Committee on Amendments to the Constitution and By-Laws respectfully reports that it has considered the report of the Committee on Medical Defense and wishes to compliment the Committee on Medical Defense for the thorough and complete investigation it has made but feels that the matter is of such importance that a further study should be made and therefore recommends and reports that these proposed amendments to the by-laws be referred to a proper standing committee for further investigation and report at the next annual meeting.—W. A. Bates, M.D., J. H. Lloyd, M.D., B. A. Bobb, M.D., R. B. Fleeger, M.D., F. S. Howe, M.D.

Dr. Bates moved that the reports be accepted and that the By-Laws be referred to the proper committee. Supported by Dr. Pankow. *Motion carried.* Moved by Dr. Cook and seconded by Dr. Riggs that proposed amendments to the By-Laws be placed in the hands of the standing committee on Public Policy and Legislation. *Motion carried.* Also it was requested that the literature regarding this matter be mimeographed and distributed to members for their information.

Dr. Pankow raised the question as to whether a doctor was eligible to sit in these meetings for a delegate who was absent unless they are duly elected by their district society. He questioned the right of Dr. Bates, who was sitting in for Dr. Whiteside, to have a vote in this meeting and made the motion that Dr. Bates be refused this privilege. *Motion seconded by Dr. Gregory and defeated.*

Dr. Baughman presented the report of the reference committee on Reports of Officers. The committee congratulates the association on the fine program that it has accomplished during the past year and wishes to especially comment on the increase of membership over last year, also to express thanks of the association to the 2nd District society for the splendid entertainment. Motion made by Dr. Baughman and seconded by Dr. Whitson that this report be approved. *Motion carried.*

The amount of annual dues was discussed at this time. It was moved by Dr. Howe, seconded by Dr. Cook that the dues remain the same. *Motion carried.*

Dr. Shirley read two telegrams which he had received extending an invitation to A. M. A. convention to be held in St. Louis in 1943. Discussion ensued. Dr. Pankow moved that the delegates be uninstructed. Seconded by Dr. Bates. *Motion carried.*

Dr. Baughman gave a report and made the following motions: That the State Medical Association contact the S. D. Tuberculosis Association with the view of making more effective the tuberculosis prevention program and the use of the Christmas Seal money, especially to secure the coöperation, if possible, in allocating these funds to the Health Department so that they

can be matched with Federal funds and carry on a more effective tuberculosis program in the state. Motion seconded by Dr. Lloyd. *Motion carried.* That the State Medical Association contact the various infantile paralysis committees with the same proposition of allocating their funds and profits obtained from the President's Ball, to the Health Department in order that the funds may be matched on a 50-50 basis so that a more effective program may be carried on in the state. *Motion seconded by Dr. Whitson and carried.*

Following a short discussion, the meeting adjourned.

C. E. SHERWOOD, M.D.,
Secretary-Treasurer.

REPORT OF THE AUDITING COMMITTEE

Honorable Council: The following is a report of the Auditing Committee:

1. All cash taken in checked against deposit slips in bank and found correct.

2. All bills paid checked against cancelled checks from bank and found correct.

3. The Legislative account checked separately, accounts received checked against bank deposit slips and were found to be correct.

All bills paid checked against cancelled checks and were found correct.

Therefore, the Committee found the Secretary's books to be in first-class shape, and all accounts checking correct.

The Committee on behalf of the Council wishes to thank the Secretary, Dr. C. E. Sherwood, for his careful and complete system of handling the State Society accounts.

Respectfully submitted,
D. S. BAUGHMAN, M.D., Chairman
J. H. LLOYD, M.D.
W. E. DONAHOE, M.D.

REPORT OF COMMITTEE ON SCIENTIFIC WORK

Your Committee on Scientific Work wishes to present the program of the South Dakota Medical Association for the year 1940 as its contribution. At this time no further comments will be made on this subject, but at another time some remarks will be made.

Respectfully submitted,
J. C. SHIRLEY, M.D.

REPORT OF COMMITTEE ON PUBLIC POLICY AND LEGISLATION

This not being a state legislative year, matters pertaining to this activity were nearly entirely of a national nature. There has been and still are many matters pending before our National Congress that are of vital importance to the medical profession. Through recommendations made by the Legislative Committee of the American Medical Association, your officers and members of this committee have been kept informed of progress made in these activities. Recommendations have been made to us with the plan of contacting our representatives and senators or committee chairman to discourage the passage of certain bills and encourage passage of others. The Wagner proposed amendment to HR 6635, pending in the Senate before the Committee on Finance, authorizes the Social Security Board to make provision for furnishing medical, surgical and institutional rehabilitation or other services for the class of persons who are unable to work because of disability that may be relieved or removed by such services. The plan seems to contemplate this service to all persons regardless of their ability to provide for themselves. This matter was called to the attention of the Committee on Finance, urging them to use their efforts against this amendment using the above argument. Recently a bill was introduced to the Committee on Judiciary who were considering HR 8963 by Representative Tolan of California. This bill gives chiropractors the right to treat injured Federal employees who are entitled to the benefit of the State Employees' Compensation. The chairman of this committee was written to and the fact of a large percent of failures of chiropractors to pass the Basic Science Board was called to his attention. The best interest of all would be best served by failure to pass this law.

Respectfully submitted,
J. C. SHIRLEY, M.D.

REPORT OF COMMITTEE ON PUBLICATIONS

The JOURNAL-LANCET was designated as the official publication of the South Dakota State Medical Association for a period of five years, at the 1938 meeting of the association. The cost of the publication being $1.75 per subscription for this year. Next year the subscription price will return to its original amount, $2.00.

Respectfully submitted,
CLARENCE E. SHERWOOD, M.D.,
Chairman

REPORT OF THE COMMITTEE ON MEDICAL DEFENSE

There has come to our attention, four cases of suit against fellow practitioners since the last regular session of this association.

No. 1 suit was threatened against a surgeon who found it necessary to wilfully tie off and ligate the common bile duct in order to control an otherwise uncontrollable hemorrhage from the cystic artery. This defect was later repaired and the patient recovered. The insurance company made a settlement satisfactory to the plaintiff and to the defendant.

No. 2 suit was brought against a physician and surgeon on such trivial support that the case was thrown out of court by the presiding judge.

No. 3 suit was brought against a surgeon for apparently carelessly but knowingly having ligated the common duct. This suit was instigated because of comments made and encouragement given by another doctor in the community who had referred the case to this surgeon. Due to a faulty drawing of the complaint, the court entertained and granted a motion for dismissal. No further action has been taken at this time.

No. 4 suit is threatened against a surgeon who it is alleged, left a sponge in an abdomen some 14 years ago. In addition to the fact that this patient had a previous operation, and so divides the liability, it is believed that the statute of limitations will adequately take care of this suit.

There have been other actions brought and threatened during the past year but they have not been called to the attention of your committee.

Your committee recommends and urges that the secretaries or other persons of the district societies promptly report suits brought or threatened against physicians and surgeons in this state, to the State Secretary or the members of the Medical Defense Committee.

Your committee presents herewith a proposed amendment to the present By-Laws of the State Medical Association, to be known as Section VII Chapter 5. We respectfully recommend adoption of this proposal as submitted. (Not included in printed report. To be sent for your information through the mail.)

Respectfully submitted,
L. J. PANKOW, M.D., *Chairman*
G. H. RICHARDS, M.D.
F. D. GILLIS, M.D.

REPORT OF THE COMMITTEE ON PUBLIC HEALTH

Your General Chairman has written to the chairman of each sub-committee for a report of his activities.

Dr. R. G. Mayer, chairman of the sub-committee on Syphilis Control, states that he has nothing to report but has written to Dr. Ohlmacher for some statistics on Wassermann reports in the state.

The sub-committee on Tuberculosis, consisting of F. S. Howe and J. Vincent Sherwood, report as follows:

"The sub-division on tuberculosis of the Public Health Committee of the State Medical Society has some suggestions to make relative to tuberculosis matters in the state. It has been rather a handicap at times for the tuberculous in certain counties to have the charge as high as it is. At times some of the counties have been rather short-sighted in discouraging the tuberculous to seek admission to the State Sanatorium. This has been done because the county had failed to make sufficient levy to take care of the tuberculous, or because the county was imbued with a false idea of economy. It has been a fact, however, that patients have been refused admission to the sanatorium because the county has said there were no funds avail-

able. This, of course, would not stand up under investigation but the applicant does not know this. We have felt for some time that the state should subsidize to a greater extent the patient's care at the State Tuberculosis Sanatorium at Sanator. We therefore recommend that a different rate of pay for the care of patients at the State Sanatorium be made. We do not feel that the basic rate of fifteen dollars ($15.00) a week be changed as that amount should be coming to the state if, and when, one able to pay that amount is admitted to the sanatorium. We do feel, however, that there should be devised a system of payment so that the county charge should never be more than ten dollars ($10.00) a week or even less. We have thought that at the hearing for admission of a patient, an honest endeavor should be made to establish a fair and equitable amount that would fall on the patient or those responsible for his care and the rest of the fifteen dollars ($15.00) per week fall back on the county with a maximum charge on the county of ten dollars ($10.00) per week. If the difference between the charge of fifteen dollars ($15.00) per week and the amount the patient could pay is more than ten dollars ($10.00) then the state should stand that difference. The money then collected from the patient would, of course, be sent to the state. Possibly the easiest way to establish this would be for the charge of fifteen dollars ($15.00) to be made to the county each month, and the county pay to the state the ten dollars ($10.00) per week and the amount collected from the patient. The details of this should be worked out in the legislative committee, probably with the help of the State Auditor, and with a member of the Board of Charities and Corrections. We feel that if the charge to the county were reduced, patients would get in sooner many times and be kept here longer by the counties.

"We feel that a more adequate control of the open case is needed. At present the sanatorium has no control over the desertion of a patient. Many times an open active case will leave to go home and infect the rest of the family and others. We feel that some definite law should be on the public health statutes whereby these cases might be controlled. We feel that those cases who are not coöperative and who refuse to be hospitalized when they are open active cases should be committed to the sanatorium by court, there to remain until they are considered not a public health menace or until they are sputum negative for tuberculosis, or until adequate arrangements can be made for their care at home. Adequate care should be determined by the county health officer following a line recommended by the sanatorium or a committee from the State Medical Society.

"The State Sanatorium was established and given a charter to care for pulmonary tuberculosis. We feel that the word 'pulmonary' should be eliminated so that all forms of tuberculosis can be admitted.

"The State Sanitorium has not been able to care for all types of tuberculosis but we hope that the next legislature will appropriate sufficient funds to establish a surgical unit so that we can do the requisite things for adequate care of all forms of tuberculosis. The superintendent of the State Sanatorium is taking a postgraduate course in chest surgery so that such type of work can be done in our own sanatorium. With a consulting staff we will be able to care for the bone work and other extrapulmonary forms of tuberculosis. When this is accomplished, and only then, will the state be getting full value from its investment.

"I think also that we should provide that patients may be admitted for observation and diagnosis as well."

As South Dakota representative of the National Association of School Physicians, your General Chairman, through the cooperation of the South Dakota Tuberculosis Association, has made a survey of the efforts being made to control tuberculosis among the teachers and other employees in the schools of South Dakota and this report has been forwarded to Dr. J. A. Meyers of the National Association. Four hundred and nine questionaires were mailed to city school boards and sixty-eight questionaires were mailed to county superintendents with the following results:

224 school boards have reported.

What has been done in the past: 146 boards required tuberculin testing and X-ray follow-up when requested by the board of health.

What is being done: 50 boards require tuberculin test and X-ray at present. 10 boards report teachers taking tests voluntarily. 165 boards report nothing being done.

What will be done: 116 boards indicate possible future action.

40 county superintendents of rural schools report: Past: 32 used testing program when required by board of health. Present: Nothing has been done since required by board of health. Future: 7 report nothing ever done about it and no plans for future.

All of this report, of course, refers to official action of boards. We know very well that much work towards tuberculosis control has been accomplished through the service of the state health department and the education program of the Christmas Seal service.

Respectfully submitted,
D. S. Baughman, M.D., *Chairman*

REPORT OF SUB-COMMITTEE ON SYPHILIS CONTROL PROGRAM

Wassermann Tests	Total	Positive
January 1, 1939, to July 1, 1939	9,772	745
July 1, 1939, to January 1, 1940	9,092	420
Kahn Tests		
January 1, 1939, to July 1, 1939	10,899	627
July 1, 1939, to January 1, 1940	20,291	706
Premarital Tests		
July 1, 1939, to January 1, 1940	4,038	30
Prenatal Tests		
July 1, 1939, to January 1, 1940	4,772	49

These statistics show the marked increase in the number of Kahn Tests in the last half of the previous year, or since the compulsory premarital test law went into effect. But since the number of premarital tests accounted for less than half of the increase, the remainder were probably due to the incidental educational program and publicity in connection with the passage of the statute.

The state laboratory does not keep a record of whether the positives are repeat cases, since oftentimes the physicians do not answer the question on the data card asking if it is the first specimen.

The figures show that the percentage of positives is approximately 1 per cent or less, which compares very favorably for South Dakota regarding the incidence of syphilis, since according to Dr. Thomas Parran, Surgeon General of the United States Public Health Service, the positives should run from 5 to 10 per cent.

The prenatal tests also showed approximately 1 per cent positives, and Dr. Parran reports 6 per cent of pregnant women show positive Wassermann tests. However, your committee urges the routine Wassermann test on every patient, since it has been reported that when Wassermann tests are taken only when syphilis is suspected only .6 out of 1000 are positive, while in routine Wassermann tests 44 out of 1000 are positive.

From these statistics it is evident that syphilis is not as prevalent in South Dakota as in other parts of the country but it is found often enough to warrant the taking of routine Wassermann, particularly on hospitalized patients.

Respectfully submitted,
R. G. Mayer, M.D., Aberdeen, *Chairman*
H. D. Sewell, M.D., Huron
Anton Hyden, M.D., Sioux Falls

REPORT OF COMMITTEE ON RADIO BROADCAST

Your Committee on Radio Broadcasting herewith presents its annual report.

During this fiscal year, the broadcasting beginning Sunday, November 5, up to and including Sunday, May 19, the various districts representing the components of the State Association, have, through their membership, presented the following number of talks, these talks including also those of the State Board of Health as listed:

Aberdeen District No. 1—2 papers.
Watertown District No. 2—2 papers.

Madison District No. 3—3 papers.
Huron District No. 5—2 papers.
Mitchell District No. 6—1 paper.
Sioux Falls District No. 7—4 papers.
Yankton District No. 8—5 papers.
Black Hills District No. 9—1 paper.
Northwest District No. 11—2 papers.
State Board of Health—5 papers.

The response during the past year to requests by our State Secretary that the several districts provide papers to be broadcasted, has been good. While it is true that in a few instances the deliveries of the papers have been somewhat delayed, causing some anxiety to your Broadcasting Committee, on the whole it has been a pleasure to note the readiness and interest manifested in this educational feature of the Association.

Your committee repeats, it continues to feel that the work undertaken by the State Association in broadcasting medical information has been of real public interest. Letters of commendation and inquiry are not at hand, since the broadcasting is now done by KSOO, but information comes to hand that in various sections of the country many radio fans are interested, which indicates that the listening public continues to be anxious for authoritative medical information.

The following letter was received from Station KSOO:

"It has now been quite a period of time since the public program of the South Dakota State Medical Association made its debut over KSOO. We at KSOO feel that this program has a definite place in good radio, and certainly is valuable addition to the public service program schedule of KSOO. We know the series has been a definite value to listeners in South Dakota as well as the areas in adjacent states served by KSOO.

We would appreciate your conveying to Dr. Hohf and the other members of the Radio Committee, Dr. Vaughn and Dr. Jones, as well as to the doctors who have cooperated so splendidly in preparing papers, and Dr. Hummer who has delivered them, and, further, to Dr. Sherwood, and the South Dakota State Medical Association itself, our appreciation for all they have done to make this a truly worthwhile series of programs.

We look forward with interest to a continuation of this public service series and we believe that our cooperative efforts will continue to be of great value to the radio listeners."

Again the committee urges that it would be desirable to have the papers in the hands of the committee at least thirty days preceding their broadcast, in order that, if lapses occur, substitutes may be immediately available. Interruptions in the program, which should not occur, can thus be avoided.

Your committee recommends that a vote of thanks by this body be extended through its secretary to Dr. Hummer of Sioux Falls who puts on the talks and the Sioux Falls Broadcasting Association for its courtesy in presenting and making available to us the facilities of Station KSOO at Sioux Falls for these medical broadcasts.

Respectfully submitted,
S. M. HOHF, M.D.
E. W. JONES, M.D.
J. B. VAUGHN, M.D.
W. E. DONAHOE, M.D.

REPORT OF THE COMMITTEE ON POSTGRADUATE COURSE

Your committee had considerable correspondence relative to instituting refresher courses at various sections in the state as was done last year. A meeting of the committee was held at the meeting of the Health Officers in the fall.

Owing to conflicts in the dates of the men we hoped to procure for these courses it was decided that April would be the optimum time for this course. Plans were made to procure Dr. Wm. F. Mengert of Iowa City for Obstetrics talks and Dr. L. H. Wiser of Minneapolis for talks on Venereal Diseases.

Plans were made to have a circuit of four centers, giving a day in each place. Watertown, Mitchell, Pierre and Rapid City were tentatively selected for the centers.

Plans did not materialize so the course was not given this year.

Respectfully submitted,
CLARENCE E. SHERWOOD, M.D.,
Chairman

REPORT OF COMMITTEE ON NECROLOGY

In submitting this report, it is hard to find words to express one's sentiments. It is a report of work that is finished and of work that we know has been well done by valiant soldiers in the battles of life and death. It is with sadness that we note their passing on to that other world, but we feel cheered by the knowledge that their presence in this world has made it a better place in which to live.

We submit the following names: (As nearly as we can find, this list is complete and correct.)

JOSEPH MARK WALSH, M.D. — Age 61. Rapid City. University of Illinois College of Medicine, Chicago, 1905; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; for many years a member of the board of education. Died June 26, 1939, of bronchogenic carcinoma of the lung.

JOHN F. TURNER, M.D. — Age 72. Canton. Baltimore Medical College, 1893. Died June 21, 1939, following an operation on the prostate.

WAYNE PAUL O'BREIN, M.D. — Age 50. Hot Springs. University of Illinois College of Medicine, Chicago, 1911; on the staff of the Veterans' Administration Facility, where he died July 25, 1939, of angina pectoris.

ALBERT HERRICK THORNTON, M.D. — Age 64. Edgemont. State University of Iowa College of Medicine, Iowa City, 1898; medical director of the Edgemont Hospital. Died May 22, 1939, of chronic myocarditis following chordotomy.

EDSON CAREY MILLER, M.D. — Age 92. Brookings. Chicago Medical College, 1874; member of the South Dakota State Medical Association. Died May 21, 1939, of cerebral hemorrhage.

GEORGE ALVIN CLAUSER, M.D. — Age 74. Bridgewater. State University of Iowa College of Medicine, Iowa City, 1897. Died June 27, 1939, of carcinoma.

HANS MARTIN FINNERUD, M.D. — Age 80. Watertown. Hahnemann Medical College and Hospital, Chicago, 1889; member of the South Dakota State Medical Association; vice-president and medical director of the Midland National Life Insurance Company; formerly member of the state board of regents of education; member of the board of education of the city public schools; state senator, and member of the state board of charities and corrections; was a member of the state board of exemption during the World War; formerly on the staff of the Luther Hospital, where he died July 10, 1939.

EDWIN LUCIEN PERKINS, M.D. — Age 69. Sioux Falls. Northwestern Medical School, Chicago, 1904; member of the South Dakota State Medical Association and the American Urological Association; fellow of the American College of Surgeons; past president of the Sioux Valley Medical Association; served during the World War; lecturer in obstetrics at the University of South Dakota School of Medical Sciences, Vermillion; formerly physician to the state penitentiary; on the staff of the McKennan Hospital, where he died December 10, 1939, of cerebral hemorrhage.

MATHIAS C. SCHENECKER, M.D. — Age 80. Webster. Bennett College of Eclectic Medicine and Surgery, Chicago, 1894. Died September 4, 1939, of carcinoma of the liver.

HORACE CLARE PEABODY, M.D. — Age 55. Sisseton. Chicago College of Medicine and Surgery, 1916. Died December 14, 1939, in a hospital at Webster, South Dakota, of heart disease.

ANTON JOHNSON MOE, M.D. — Age 71. Sioux Falls. Rush Medical College, Chicago, 1897; fellow of the American College of Surgeons; chief of staff of a hospital bearing his name. Died October 18, 1939, of cardiac decompensation.

JOSEPH MAURICE ALLEN, M.D. — Age 72. Rosholt. Medical Department of Hamline University, Minneapolis, 1901. Died August 8, 1939, in St. Francis Hospital, Breck-

enridge, Minnesota, of gangrenous appendicitis and coronary occlusion.

Respectfully submitted,
R. J. QUINN, M.D., *Chairman*

REPORT OF COMMITTEE ON OPHTHALMOLOGY AND OTOLARYNGOLOGY
(Advisory to State Department)

This committee has functioned in the general program of the State Medical Association through the coöperation of the members of the South Dakota Academy of Ophthalmology and Otolaryngology.

A special feature pertaining to their work has been in connection with the "Department for Aid to the Needy Blind," whereby qualifying examinations are conducted for applicants, and remedial measures instituted where feasible. The medical feature of this work is under the able direction of Dr. C. E. Robbins of Pierre.

The rehabilitation of crippled children as it pertains to head conditions, has been carried on during the past several years through conjoint action with the state department.

Respectfully submitted,
JOHN B. GREGG, M.D.
H. L. SAYLOR, M.D.
H. D. NEWBY, M.D.

REPORT OF COMMITTEE ON ARMY MEDICAL LIBRARY

Your Committee on the Army Medical Library and Museum wishes to report the following:

The matter of appropriation for the construction of a new building for the Army Medical Library and Museum at Washington was referred to the Committee on Military Affairs with instructions to present to the proper authorities our recommendations to members of Congress to support this appropriation. There are no special recommendations for this Committee to follow through the year.

Respectfully submitted,
J. C. SHIRLEY, M.D.

REPORT OF COMMITTEE ON MILITARY AFFAIRS

The Committee on Military Affairs believes that at this time it would be well to call to the attention of the physicians of our Society the important role played by the physician in war time. We have but to look abroad and see how the members of our profession have been called upon in the belligerent countries, to uproot themselves from their everyday lives and see how they have been thrown into the conflict in which their various countries have been abruptly placed, to realize that war drastically affects the physician.

The medical man by the very nature of his profession changes rapidly from civil to military practice, but it seems that it would be well for especially the younger members of the profession to consider the possibility that they might be called upon to be members of our military forces and to contemplate how such a change would affect them. To take advantage now, in time of peace, of the opportunities that are now to be had, to learn the elements and procedures of military practice would be time well spent, for those who would possibly be affected, were a mobilization to occur. We have but to look back to the first world war to realize that many of the hardships and confusion that those physicians who joined the military forces of our country experienced, were to a great extent due to an utter ignorance of military procedure.

The change from civilian life to the arduousness of military activity would be an abrupt and hard change for the average physician to make, and it appears to the committee that during these strenuous times the younger members of our society should endeavor to familiarize themselves with some of the phases of military medicine and evidence an interest in the preparedness of our country by becoming members of the medical reserve or otherwise preparing themselves to share the burden that in these days of paranoid dictators might be abruptly thrust upon them.

Respectfully submitted,
H. T. KENNY, M.D., *Chairman*

REPORT OF COMMITTEE ON ORTHOPEDICS

As chairman of the Committee on Orthopedics, I beg to submit the following as to the Crippled Children's activities for the ten-month period beginning July 1, 1939, and ending April 30, 1940. The information contained below was supplied by Dr. A. Triolo's office, director of the crippled children's work of the State Board of Health.

1. Number of clinics held: 5; attendance: 166.
2. Cases seen in clinics—Dr. Van Demark: 116; Dr. Butler: 29; Dr. Baily: 21.
3. Applications received: 149.
4. Cases accepted for treatment: 198.

1.	Poliomyelitis	37
2.	Congenital dislocated hips	7
3.	Paralysis due to birth injury	7
4.	Club foot	16
5.	Harelip and cleft palate	28
6.	Tuberculosis of bones and joints	6
7.	Osteomyelitis	23
8.	Cerebral palsy	1
9.	Scoliosis	10
10.	Burns	8
11.	Deformities due to injuries	6
12.	Miscellaneous	49
	Total	198

5. Cases treated: 209.
6. Cases hospitalized: 179. Number of hospital days: 3422.
7. Hospital fees paid: $15,371.42.
8. Surgeon's fees paid: $7,841.90.
9. Amount paid for braces, appliances, casts: $1,966.70.
10. Amount paid for transportation: (Crippled children and guardian): $525.16.

There are 1,092 cases on the state registration. Of these, 977 have received some form of treatment.

Summary. It would seem that there has been increased interest shown by various lay organizations. During the past year the Society of Crippled Children has been organized, which I believe would materially assist in stimulating interest in the care of the crippled child. Thus far the membership has been very limited and the organization has not become well established. However, I believe it is a worthy bginning. The amount of money for taking care of the crippled is the same as last year, and it is still being handled on a 50-50 matching proposition, and the State Board of Health, through the Crippled Children's Department, has the supervision. I believe the number of the personnel and their salaries is the same as last year. The state was offered $35,000 by the Federal government, but only $25,000 was accepted by the state. It is my impression that the great majority of cases are taken care of by the doctors in this state, but several have been referred elsewhere when special skill was required. There is much to be accomplished in the organization of this work and in the follow-up of these cases, but a good start has been made.

Respectfully submitted,
GUY E. VAN DEMARK, M.D., *Chairman*
P. T. GEYERMAN, M.D.
R. A. RICHARDS, M.D.
Division of Crippled Children,
State Board of Health.

COUNCIL MEETING
South Dakota State Medical Association
Huron, July 28, 1939

The meeting was called to order by O. J. Mabee, president-elect, at 1:30 P. M., in the absence of the chairman.

Present were: Drs. G. E. Burman, J. F. D. Cook, D. S. Baughman, C. E. Lowe, W. E. Donahoe, C. E. Sherwood, J. H. Lloyd, O. J. Mabee, C. E. Robbins, B. M. Hart, W. G. Magee, J. R. Westaby, Wm. Duncan, J. C. Shirley and B. A. Dyar.

Absent: J. D. Whiteside, S. M. Hohf, R. B. Fleeger and R. V. Overton.

Quorum present.

It was moved that the reading of the minutes of the last meeting, as printed in the July issue of the JOURNAL-LANCET, be dispensed with. *Motion seconded and carried.*

Dr. B. A. Dyar, medical supervisor of the Farmers Aid Corporation, presented the latest developments in a new proposed plan for continuation of the medical aid program.

Dr. Lloyd moved that the proposed plan by the Medical Society Committee be submitted to Dr. Williams, medical director of the Farm Security Administration, and his committee, and if they have any changes to make such changes can be referred back to the Council. *Motion seconded by Dr. Duncan and carried.*

Dr. Sherwood brought up the matter of printing a new supply of the constitution and by-laws of the State Medical Association which would include all recent changes therein, and asked for authorization for such printing.

Dr. Cook moved that the Secretary be empowered to have the constitution and by-laws brought up-to-date and a supply of 750 be printed. *Motion seconded by Dr. Donahoe and carried.*

Dr. Westaby moved that Dr. Sherwood be allowed to have printed blank vouchers for use in his office. *Motion seconded by Dr. Mabee and carried.*

Dr. Sherwood presented the matter of having duplicate blanks for remittances of district medical societies' secretaries printed. Dr. Lloyd moved that this printing be allowed. *Motion seconded by Dr. Hart and carried.*

The Council took up the matter of retaining Karl Goldsmith as attorney for the State Medical Association. This matter was discussed. Dr. Donahoe moved that the society retain Karl Goldsmith as attorney at a fee of $300 per year. *Motion seconded by Dr. Robbins and carried.*

The matter of paying councilors' expenses was discussed. Dr. Donahoe moved that the councilors be paid for expenses of attending special council meetings on the basis of 5c a mile. *Motion seconded by Dr. Hart and carried.*

The next matter discussed was the setting of the date for the 1940 State Medical Association meeting which is to be held in Watertown. Dr. Lloyd moved that the meeting be held May 20, 21, 22, 1940. *Motion seconded and carried.*

The constitution and by-laws provide that at least six months before the annual meeting a committee of three be appointed to make arrangements for the annual meeting. Dr. Magee moved that the president, president-elect and secretary-treasurer act as the committee on arrangements for this meeting. *Motion seconded by Dr. Westaby and carried.*

It was also necessary at this time to appoint a local chairman for the annual meeting. Dr. Magee moved that Dr. Jorgenson be appointed as local chairman. *Motion seconded by Dr. Cook and carried.*

The councilors discussed the matter of whether or not to resume a radio broadcasting program again. A contact had been made with radio station WNAX and the only available time for such broadcast would be 9:30 P. M on Sundays. It was felt that the society should contact station KSOO and find out what hours of broadcasting could be secured there. Dr. Cook moved that the society contact the Sioux Falls station and find out what time could be obtained and the plan required to broadcast from that station. *Motion seconded by Dr. Lloyd and carried.*

Dr Sherwood brought up the matter of calling a meeting of the district societies' secretaries each year. Dr. Baughman moved that at the first Council meeting of the new year, the secretaries also be called together for a meeting. *Motion seconded by Dr. Westaby and carried.*

Dr Sherwood brought up the matter of accident insurance plan for high schools as formulated by the South Dakota State High School Athletic Association. Dr. Robbins moved that the Council accept this plan. *Motion seconded by Dr. Lowe and carried.*

Dr. R. C Williams, medical director of the Farm Security Administration, Dr. Dodge, regional supervisor of the Farm Security Administration medical aid programs, and Mr. MacMillan, state FSA supervisor, appeared before the council to discuss the matter of continuation of the Farmers Aid Corporation program. Because of some difficulties which would arise immediately after such program was put into effect, it was felt better to start the program on a small scale. Dr. Duncan moved that the Council recommend that the Pierre District Medical Society carry on further negotiations in setting up a plan for medical relief. *Motion seconded by Dr. Baughman and carried.* It was also felt necessary to call an Inter-Allied Council meeting to explain the proposed set-up to the Inter-Allied councilors.

Dr. Westaby reported on the A. M. A. meeting which he attended as a delgate this year. Dr. Cook moved that this report be accepted and sent to the JOURNAL-LANCET for publication. *Motion seconded by Dr. Robbins and carried.*

There being no further business the meeting adjourned.

C. E. SHERWOOD, M.D., *Secretary-Treasurer.*

COUNCIL MEETING
South Dakota State Medical Association
Huron, January 15, 1940

Meeting was called to order by the chairman, B. M. Hart, at 10:30 A. M. Roll call. The following members were present: J. C. Shirley, O. J. Mabee, B. M. Hart, C. E. Sherwood, J. R. Westaby, W. G. Magee, D. S. Baughman, C. E. Robbins, G. E. Burman, J. H. Lloyd, W. E. Donahoe, S. M. Hohf, R. B. Fleeger, R. V. Overton, C. E. Lowe, Wm. Duncan, J. F. D. Cook and in addition the following secretaries of component societies: J. P. Jones, R. E. Jernstrom, M. M. Morrissey, C. L. Olson and M. C. Rousseau.

Minutes of the council meeting of July 28, 1939, were read and approved.

Dr. Robbins reported on the present status of the negotiations of their district society with the Farm Security Administration relative to furnishing medical care to clients. This matter was discussed by Dr. Shirley and many others. It was Dr. Shirley's prediction, based on conference he had had with the regional officers of the Farm Security Administration, that in all probability the plan would be abandoned. There followed a general discussion of medical care of the indigent during which about as many separate opinions were voiced as there were members participating. It was moved by Dr. Lloyd and seconded by Dr. Robbins, that it was the opinion of the Council that the Pierre district should continue to hold themselves open for negotiations on the plan along the lines as laid down by the Council previously. *Motion was carried.*

Dr. Sherwood read a letter from the National Retail Druggist Association in which they presented the resolution passed by their association favoring sale of vitamin products only through regular drug channels and asked for support of the medical association. After some discussion it was moved by Dr. Baughman and seconded by Dr. Lloyd that the Council of the South Dakota State Medical Association approve of the sale of vitamin products only through regular drug channels and they further recommended that they be sold only on prescription. *Motion was carried.*

A letter was read from the American Medical Association, calling attention to the fact that the President had included a budget item to provide purchasing a site and caring for preliminary details for the building of an army medical library and museum and asked that we contact Rep. Francis Case, who is a member of the appropriations committee, and ask him to give support to this. Motion was made by Dr. J. R. Westaby and seconded by Dr. Lloyd that the Secretary write Francis Case urging the support of this budget item and that the representative from the Hills district be also asked to write Francis Case personally urging his support. *Motion was carried.*

Dr. Sherwood read correspondence he had had personally with representatives in congress relative to building, by the administration of Veterans' Hospitals and also correspondence from a member of the society relative to this matter and asked what the society wishes to do relative to these matters. It was moved by Dr. Duncan and seconded by Dr. Magee that the president appoint a committee to consider this material and to contact members of the Veterans' Organizations to get their reaction and report a plan of action at the annual session. This motion passed and President Shirley appointed the committee on military affairs to consider this.

Dr. Sherwood presented material relative to the emigrant physician problem and asked that it be referred to committee for consideration. After discussion it was moved and seconded that the material be given to the committee on medical licensure and they be asked to report upon the material with recommendations at the next annual session.

The matter of appointing delegates to the convention on re-

vision of the U. S. Pharmacopia was presented and after discussion it was moved by Dr. Lowe and seconded by Dr. Duncan that money not be appropriated to send delegates to this convention. *Motion was passed.* Then it was moved by Dr. Baughman and seconded by Dr. Lloyd that if anyone intended to be in the neighborhood of Washington at the time of the convention, that they be appointed as our representative without expense to the association. *This motion was carried.*

The matter of reporting state meetings was discussed and motion made by Dr. Mabee and seconded by Dr. Robbins that no change be made in method of reporting.

A letter was read by the Secretary relative to uniform by-laws and constitutions for hospital staff. It was decided no action be taken at this time and no recommendations be made.

Dr. Cook reported Minnesota has accepted our Basic Science Law and that reciprocal relations were about to be signed between the two states.

The matter of whether the South Dakota State Medical Association should sponsor legislation looking toward the formation of an integrated medical association similar to the integrated bar was presented and communications read from our attorney relative to this matter. After discussion, it was moved by Dr. Cook and seconded by Dr. Duncan, that the Secretary should mimeograph the discussion of the proposal contained in Attorney Goldsmith's correspondence and that a copy be sent to the delegates and officers of the state and component societies in order that they may be familiar with the situation and able to instruct their delegates relative to the matter.

Dr. Sherwood called attention to the fact that an amendment to the constitution of the South Dakota State Medical Association was to be voted upon at the annual session and that the component societies should instruct their delegates in this matter. After discussion it was pointed out that the constitution required that each society be notified at least two months prior to the annual session relative to pending legislation and that this would be done.

Discussion of the National Committee of Physicians was held with explanation of the status of this committee and their aims. No official action was taken.

Dr. Shirley presented the information that in five of seven institutions under the jurisdiction of the Board of Charities and Corrections, the problems were largely medical and it was his opinion that the best interest of the institutions would be served if a member of the State Board of Charities and Corrections was a physician. The matter was discussed. A motion was made by Dr. Mabee and seconded by Dr. Baughman, that the resolution be drawn up suggesting to the governor that in view of these facts it would be desirable to have a medical man on this board, and that the State Medical Association would be glad to present a list of men from which an appointment might be made in case of a vacancy should he so desire.

Dr. Sherwood discussed membership in the state association and presented some statistics relative to the percentage of membership in the different districts and the state at large.

	Total Physicians	Active	Govt.	S.D.S.M.A.	Pct.
District 1	57	55	2	38	66⅔
District 2	37	37	0	25	67
District 3	28	28	0	24	85.9
District 4	29	24	5	18	62
District 5	23	22	1	14	60.8
District 6	46	43	3	26	56.5
District 7	71	69	2	50	70.4
District 8	73	65	8	42	57.5
District 9	96	74	22	52	77
District 10	16	11	5	7	43.75
District 11	15	10	5	7	46⅔
District 12	26	23	3	14	53.3
Totals	517	461	56	317	61.3

Number of government employees in Society—11.

Number of government employees out of society—45.

Pct. if government employees were all members—70 per cent.

Dr. Shirley was called upon and presented a discussion on membership in the state association. Dr. Jernstrom and Dr. Baughman also discussed methods of obtaining membership.

C. E. Sherwood, M.D., *Secretary-Treasurer.*

ADDRESS OF THE PRESIDENT

J. C. Shirley, M.D.,
Huron, South Dakota

To the Officers, Councilors, and Delegates of the South Dakota State Medical Association in session at Watertown, South Dakota, May 20, 21 and 22, 1940.

It has been a privilege to act as president of our Society during the past year. I appreciate the fine spirit of coöperation and helpfulness of the officers, councilors, and committee chairmen, in carrying on the work of the society. In summarizing the activities of your officers and committees for the past year, my report will consist largely in giving somewhat more in detail the information that has come to you through the news letter that has been prepared by our state secretary and that you have received at intervals through the year.

The members of our standing and special committees have been active and interested in their special problems during the year. A great deal of work by these members has been carried on in a commendable manner with results that will speak for themselves. I especially want to compliment the members who have taken part in these activities in such a worthwhile manner.

At the beginning of the year it was planned to visit each of the districts. Several of the District Societies were visited, and an active interest in medical subjects was evident by large attendance and active discussion. Attempts were made to visit others but through conflicts from one cause or another, it became impossible to meet with all of them.

As stated in my message of a year ago, an objective or a goal is necessary in order that interest may be maintained. One of the objectives for this year's work was to increase the membership of the eligible practicing physicians of the state in our State Society. This objective has been attained—not, however, to the degree that had been hoped. The officers of the District Societies have been active in attempting to stimulate interest in the membership through providing interesting programs of an instructive nature, principally concerned with the advances made in the medical field. In addition to this phase of work, interest is added by the attack that has been made on organized medicine generally by ill-informed, prejudiced, or selfishly interested groups. We have tried to emphasize that each practicing physician has a duty to perform to the extent of at least giving his moral support to the work being done by the various organized medical groups, by joining his District or County Medical Society. This in turn entitles him to and makes him a member of the State and National Medical Organization. In that way he contributes to the support of these organizations, which are striving to protect his interests. The membership of our State Society has been increased 40 over the year 1939. This is a healthy growth but is one that needs to be improved upon. We must have a united front if the program that is being outlined and carried out by the various national organizations interested in medical service and practice, is to be furthered and maintained.

The Council Meetings have not been required as frequently as in legislative years—only two such meetings have been called. A special secretaries' meeting was held, in conjunction with the last meeting of the Council. There was a fair attendance of the secretaries of the various districts. The purpose of this conference was educational in character—discussing the methods of arranging programs—promotion of activities which would arouse the interest and enthusiasm of the eligible physicians in the district—attending meetings and taking an active part in their conduct—and in general to stimulate interest among the members which would make for a better and more active association.

The chief item of business at the last Council Meeting was the authorization to Pierre District Medical Society No. 4 to continue negotiations with the Farm Security Administration to set up a plan of medical relief for the Standard Farm Security clients and farm clients who are receiving grants. It is my understanding that at the present time the state officers of the Farm Security Board and the officers and members of the Pierre District Medical Society have agreed upon an arrangement, but authorization from Washington, D. C., has not yet been received. With this plan completed in a satisfactory manner other districts could function exactly the same. It is felt that if this plan is successful a great many of the difficulties encountered in the state-wide program would be eliminated.

The State Farm Security Administration officers requested that the Allied Council and the officers of the State Medical Association meet with representatives from the Lincoln office of the Farm Security Administration to determine the disposition of Farmers Aid Corporation funds that remained following the discontinuance and completion of the contract with the Allied Council last July 1. There remains some $20,000.00 of this fund that had not been dispensed. This amount of money had resulted from the contingent fund of $8,000.00 and additional moneys that were collected from clients who had received services but whose notes had not previously been paid. It was the opinion of those in attendance, including the representatives of the Allied Council and the State and District Farm Security officers, that this money should be apportioned to the professional participants of the Allied Council on a basis comparable to the amount of service that they had rendered. The data governing this is being accumulated at the present time and the funds will soon be distributed.

A communication was received from the Federal Works Agency stating "The United States Employers Compensation Commission has made provisions for medical care and hospitalization of employees who are injured while in the performance of duty while employed on projects of the Works Projects Administration. The Commission desires that these employees be referred to qualified physicians and that the medical care be distributed among such qualified physicians in as equitable a manner as possible. In order that this method of distribution could be carried out, the office solicited cooperation of the State Medical Association. It is the desire of the State Compensation Office that a list of the members of the State Medical Association who desire to participate in the treating of WPA injured cases, be supplied." This is simply another indication of the advantages accuring to those physicians who are members of the State Medical Association, and could well be called to the attention of non-member physicians in the state.

Through news letters sent out at intervals during the year by our Secretary, an effort has been made to keep the members informed on problems and activities of medicine generally. This is a service that is, in my opinion, well worth while. And I would here like to speak a word of commendation and praise for our Secretary, Dr. Sherwood. Without his valuable assistance and counsel, your officers would not have been able to carry on the work of the past year.

Matters of a National Legislative character have been prominent during the past year. A great many bills affecting the practice of medicine have been introduced, most of which contemplate in one way or another the centralization of the control of medical practice. Information on these questions is supplied regularly through the legal department of the American Medical Association, and advice is given as to the probable effects of such legislation and recommendations made as to action that should be taken in regard to it.

Every practicing physician owes it to himself and to the good of his profession to support, financially as well as morally, the National Physicians' Committee for the Extension of Medical Service.

You are all familiar with the manifest evils connected with the Wagner National Health Bill introduced in the Senate a year ago. We know it to be a definite threat to the national health and well-being of our country, and feel that it represents an effort on the part of politicians to gain control of the practice of medicine. I believe it did one good thing, however, in that it woke many of us to the fact that the American way of practicing medicine was so endangered, and was also probably responsible for forming the National Physicians' Committee which I have referred to. This committee, as you may know, is composed of an outstanding group of volunteer medical men who first organized to arouse men of our own profession to respond to a new challenge, and as its personnel has grown, they are now familiarizing the public through newspapers, magazines, and radio, with their program and policies—private and public health needs—the achievements of and the position occupied by American medicine—the services rendered by its physicians, and—how and where these services are available.

This committee has the knowledge, the personnel, and the machinery, to perform a vitally important service for the whole medical profession and to become an important aid in safeguarding the health interests of the public—in our own accepted way. As I say, you owe it to yourselves to give them your financial as well as moral support.

Along this same line, I was interested a few days ago to have my attention called to an ad appearing in the May 1st issue of the *New York Times,* entitled "Make It Snappy, Sister." The ad was a follow-up by the United States Chamber of Commerce to an article appearing in the May issue of *Nation's Business,* entitled "The Case for Private Medicine." Through their cooperation I was able to obtain several poster reprints which have been distributed to you, and which I hope will interest you as it did me. This is to my mind the kind of public relations material of which we are very much in need. The ad is available in mat form and I would like to see it reproduced in many a state newspaper as sponsored by the local or district medical society. In my recommendations to the incoming officers I have suggested a special committee on public relations, one of whose duties should be making available to the various districts and the public, this sort of publicity. Only by more and more of such efforts and activities are we going to keep away from the chaos and ruin of socialized medicine—and counteract the widespread propaganda now going out to the public toward that end.

Recommendations

And now I would like to make a few recommendations, or rather suggestions, to our new officers.

First—I believe it would be desirable for the best interests of us all, if a specific plan were developed in connection with the holding of free health clinics, which plan would tend to correct the many abuses arising from them as now carried out. This plan to be followed by each district to the end that uniform regulations would apply throughout the state. I am sorry to report that I have knowledge of a *free* clinic having been recently held for employees of one of our largest state industries. It is of course obvious that any such program should be carried out in close coöperation with our State Board of Health.

Second—That the Committee on Education and Hospitals coöperate with similar groups from other states in an investigation and report on the trend for advanced education of student nurses as it affects hospital and medical care.

Third—That a special legislative committee be appointed to safeguard our interests throughout the forthcoming session of our State Legislature.

Fourth—That a new committee be appointed and designated as the Public Relations Committee, whose duties would be to coördinate the activities between members of our association and lay groups conducting clinics and other public health projects—promotion of favorable magazine, radio and newspaper publicity material and making this available to the various districts—furnishing speakers for suitable occasions—and in general to see that damaging publicity and activities are properly refuted, and in a like manner publicity which is favorable to the accepted standards of our profession is brought out in the best light to the public in general.

ADDRESS OF THE PRESIDENT-ELECT

O. J. Mabee, M.D.

Mitchell, South Dakota

Mr. President and Fellow Delegates:

In this paper I wish to bring to your attention some of the accomplishments of the American Medical Association and of our own State Society, with suggestions as to the future work we should endeavor to carry out.

The American Medical Association's study of medical care in the United States had a strictly limited objective —a study of the need and supply of medical attention. Following the pattern of a scientific diagnosis as a preliminary necessity to the determination of the treatment that would be most helpful in the continuous improvement of the distribution of medical services, it did not seek arguments to justify any specific prescription, nor undertake to develop morbidity nor mortality statistics. It sought only facts.

Information was sought from every available source. The medical profession knows that physicians are not the sole source of information concerning either the extent of illness or the supply of medical care, but is aware, however, that the education, training, and experience of physicians renders them more capable than nonmedical personnel to recognize and diagnose illness correctly and to determine medical needs. Therefore it may be accepted as a fact that any survey of illness and need of medical care conducted by persons untrained in the art and science of medicine is predestined to produce inaccurate results, since neither the character of illness nor the need of treatment can be accurately determined by a survey conducted by this kind of personnel.

It has been estimated that at least three to four million persons receive medical services through industrial, fraternal, mutual benefit, and other similar organizations, or through prepayment county medical society plans. Information was sought from the administrators and directors of these organizations especially concerning any difficulty encountered in securing needed medical or hospital service for their membership.

The general conclusion that there is no widespread deficiency in the accessibility of medical care is confirmed by four special tests made in widely different sections of the country. State or county medical societies in New Jersey, Minnesota, Detroit, Michigan, and five Pennsylvania counties, in order to determine whether any significant number of persons desired medical care which they had been denied, inserted notices in the newspapers that cover these respective sections and made repeated radio broadcasts appealing to any person who had been unable to obtain needed medical care or who knew of any person unable to obtain such care. It was uniformly stated that every case would be investigated, and the necessary medical care provided without charge. The results were practically the same in all four areas. It was found that in nearly all cases arrangements already existed by which medical care could be obtained and that it was necessary only to inform the inquirers as to the methods of contacting the sources. That such persons

had not received it previously was due to defects in educating the public as to these sources. In one area it was estimated that the number of those who could not obtain proper medical care was one-twentieth of one per cent of the population to which the announcement was made.

This evidence does not involve the further conclusion that there are no weaknesses and defects in the present system of medical service. Examples of such criticisms have been given, such as have been made by the medical profession of its own work ever since the creation of the profession. These are specific, constructive criticisms as to defects for which a remedy is available or for which it is reasonable to seek and expect to find a remedy.

The American Medical Association advocates:

1. The establishment of an agency of the federal government under which shall be coördinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.

2. The allotment of such funds as Congress may make available to any state in actual need, for the prevention of disease, the promotion of health, and the care of the sick on proof of such need.

3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.

4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.

5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.

6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.

7. The continued development of the private practice of medicine, subject to such changes as are necessary to maintain the quality of medical services and to increase their availability.

8. Expansion of public health and medical services consistent with American democracy.

Report of Findings in South Dakota

South Dakota has an area of 77,650 square miles and had a population of 692,849 in 1930. Practically all the people are engaged in farming or in business that is indirectly dependent on the agricultural industry in the state. Since 1930, the climatic and general economic conditions in the state have made it impossible for a large percentage of the South Dakota farmers even to exist on their land, to say nothing of earning an adequate cash income. Some indication of the economic disaster experienced by many of the people in South Dakota since 1929 is given in a study of the number of families receiving unemployment relief from October, 1933, through April, 1940. During that period the maximum monthly relief load for the majority of the counties was 20 to 30 per cent of all the families residing in the area; and in some counties the percentage was as high as 80 per cent.

The FSA lends money to certain farm families, the sum varying according to the families' potential ability to repay. The loan is to be used to purchase goods, equipment, and services needed to help restore the families to a self-sustaining basis. The FSA also lends to its clients funds which are pooled in a central fund to be used for paying medical bills. The South Dakota FAC was formed to administer the pooled funds for the medical care of the FSA clients. The corporation assumed responsibility for the operation of the plan and obtained the coöperation of the physicians, dentists, hospitals, and pharmacists to provide medical, dental and hospital care, and drugs at reduced fees for the FSA clients.

According to the comments of physicians and dentists who took part in this survey, there have been no instances in which people were unable to obtain medical and dental care if they requested it. The physicians and dentists stated that they were well aware of the adverse economic conditions of the people in this area and had, therefore, given their services wherever needed without any question as to the person's ability to pay. The physicians and dentists also asserted that such a situation must be remedied soon because it is impossible to continue indefinitely to provide services at less than cost.

State and local funds available for medical care for the indigent and semi-indigent are not sufficient to meet the cost of even emergency care. The county commissioners who are responsible for providing medical care to these groups do not have sufficient funds to pay the physicians and dentists.

The resources of the FAC are limited by the amount the FSA client is able to borrow from the Federal Government, and this amount has been insufficient to pay even for emergency medical care at reduced rates.

An investigation made by the FSA in fourteen South Dakota counties discloses serious irregularities in connection with claims made by members of the professional group for services rendered, including, in a few cases, the padding of accounts and other irregularities. The FSA and the Corporation feel that on account of the facts disclosed some method must be used to verify the accounts of professional members in the other counties or a statewide investigation will be required to establish a correct basis for the final payment of the unexpended balance of the FAC funds, which amounts to approximately $21,000.

The following plan has been agreed upon by the Inter-Allied Council, the Corporation, and the FSA, in the hope that no further investigation will be necessary:

Every physician, dentist, etc., who has participated in the FAC will receive this letter: "There is transmitted to you herewith a statement of services rendered which have been approved, setting forth the name of each person to whom services were furnished under the plan, the amount charged for such services and the amount paid upon statements submitted.

"You are requested to check over this statement with your records in order to be certain that the services were rendered to the member for emergency medical care as defined in the agreement, and that the charges made by

you in accordance with the agreement are correct and that you have received the payments as shown.

"A representative of the Inter-Allied Council will review each statement returned. As each statement is approved, it will be entitled to share in the remaining fund on a pro-rated basis in accordance with the agreement. Upon receipt of final payment each professional member will be requested to release both the FAC and the patient from all further liability for the services rendered. Refund will be requested from those who have made excessive charges, or such overpayments will be offset against the final dividend.

"You are required to comply promptly with the request above outlined if you desire to share in this final distribution."

At the Council meeting last August, it was decided to set up a small district to see whether a new emergency aid program could be worked out. Pierre was chosen as the district and this was the plan:

1. $33 per family per year will be loaned for medical, hospital, dental, nursing care, and drugs, not to exceed in the aggregate the sum of $60,000 per year. This amount will permit the care of approximately 1800 families.

2. Loans shall not be made to families above the FSA level nor to families below the FSA loan level and shall include only those who are eligible to become standard clients of the FSA. The emergency health needs of the families below the standard FSA level should be provided for on an individual basis by state or other relief agencies, or, where the circumstances require, through grants permitted by the regular grant procedure of the FSA.

Those eligible for loans are:

a. Active standard borrowers of the FSA at the time of the making of the medical participation loans. This includes not only active standard cases at the present time, but also other individuals when they become standard clients.

b. Emergency borrowers of the FSA who at the time of the making of the medical participation loans are eligible to become standard clients, can execute such instruments as are necessary to bring their prior indebtedness and security to a current status, or can furnish security to the Government for previously unsecured obligations and for the medical participation loan.

3. The assumption of obligations, the maintenance of records, the preparation of reports, the collection of fees, the payment of bills, and all other business of the Pierre District Medical Care Association shall be handled by its members or their duly authorized representatives. The association and its program shall not be related in any way by name or in fact to the South Dakota Farmers Aid Corporation.

4. Other changes required in our preliminary proposal are:

a. A definite date for the plan to become effective.

b. Shall memberships of individuals become effective on the first day of the month during which application is approved—or on the first day of the month following approval.

c. Funds obtained for professional services must be divided into twelve equal monthly allotments.

5. An agreement must be given to the FSA covering the following points:

a. The association must agree to maintain a system of accounts in an acceptable form.

b. Periodic financial reports to the FSA as may be required.

c. The association must operate on a budget—both as to administrative expense and medical care; all funds are to be deposited in a joint control fund—fully insured by the Government; withdrawals are to be made only on checks signed by an authorized official of the Association and countersigned by the Regional Director or his designee.

6. The total amount of loans authorized hereunder—namely $60,000—shall not be increased without the prior approval of the Secretary of Agriculture.

However, the Government has not yet furnished the funds or signed up the clients, so the plan is not in operation at present. The main idea is that the administration of funds shall be entirely done by the group itself, and the group is small enough so that padding the accounts and so forth will be almost out of the question.

Since the Legislature convenes next year, we must watch constantly to see that laws which may be detrimental to the people of the state are not passed. Also it will be necessary to work to obtain certain bills which would be beneficial. There will be an attempt next year to get a Drivers' License Law passed, and I believe the members of the medical profession should do all we can to see that this bill goes through.

Another thing that I believe the Legislature should take up is the State Compensation laws. I think they should be amended to allow an injured employee to select his own physician and hospital without forfeiting his compensation insurance. The law should also, of course, protect those employers who maintain and operate adequate hospital and medical facilities within their own establishments.

Dr. Ohlmacher, who naturally has the welfare of the State Medical School to consider more than the rest of us have, has suggested that it would be a good thing to have the Society appropriate a certain amount to keep up and build up the School Library at Vermillion. This library includes all recent medical articles, both from the United States and from foreign countries, and these will be available to the doctors of the state. Another worthwhile suggestion from Dr. Ohlmacher is for the State Society to sponsor one or more scholarships for the medical school.

I believe the House of Delegates should give careful consideration to the needs of the indigent patients in the state and voice their approval or disapproval of the plans which the Council and the Inter-Allied Council

have adopted. The needs of the people, whether urban or rural, will always have to be met, and these conditions will necessitate all the aid that we may receive from any federal program in order to see that the care is adequate. At least this will be necessary until the economic status of the people improves.

The spirit of independence has always prevailed in South Dakota, and I hope it always will. It is upon this basis that I am firm in my conviction that we will be reluctant to favor any federal health legislation that will not leave to the state a decision for its acceptance or rejection.

SOUTH DAKOTA STATE MEDICAL ASSOCIATION ROSTER--1940

Membership by Districts

ABERDEEN DISTRICT No. 1

PRESIDENT
McCarthy, P. V. — Aberdeen

SECRETARY
Cooley, F. H. — Aberdeen

Adams, J. F.	Aberdeen
Aldrich, H. H.	Wessington
Alway, J. D.	Aberdeen
Bates, W. A.	Aberdeen
Bloemendaal, G. J.	Ipswich
Brenckle, J. F.	Mellette
Brinkman, W. C.	Veblen
Bruner, J. E.	Aberdeen
Bunker, Paul	Aberdeen
Calene, J. L.	Aberdeen
Cook, J. F. D.	Pierre
Cooley, F. H.	Aberdeen
Drissen, E. M.	Britton
Eckrich, J. A.	Aberdeen
Elward, L. R.	Doland
Farrell, W. D.	Aberdeen
*Freyberg, F. W.	Conde
Gebler, R. M.	Aberdeen
Graff, Leo W.	Britton
Keegan, Agnes	Aberdeen
Keller, Ted	Leola
King, H. I.	Aberdeen
King, Owen	Aberdeen
Kraushaar, J. O. F.	Aberdeen
McCarthy, Paul	Aberdeen
Mayer, R. G.	Aberdeen
Murdy, B. C.	Aberdeen
Murdy, Robert	Aberdeen
Pittenger, E. A.	Aberdeen
Ranney, T. P.	Aberdeen
Rice, D. B.	Britton
Rudolph, E. A.	Aberdeen
Scallin, Paul R.	Redfield
Schuchardt, I.	Aberdeen
Stephens, E. E.	Eureka
Whiteside, J. D.	Aberdeen
Waldorf, C. E.	Redfield

WATERTOWN DISTRICT No. 2

PRESIDENT
Jorgenson, M. C. — Watertown

SECRETARY
Rousseau, M. C. — Watertown

Adams, M. F.	Watertown
Barton, H. J.	Watertown
Bates, J. S.	Clear Lake
Brown, H. R.	Watertown
Christensen, A. H.	Clark
Freeburg, H. M.	Watertown
Hammond, M. J.	Watertown
Johnson, A. E.	Watertown
Jorgenson, M. C.	Watertown
Kilgaard, R. M.	Watertown
Koren, F.	Watertown
Lockwood, J. H.	Henry
McIntyre, P. S.	Bradley
Magee, W. G.	Watertown
Maxwell, R. T.	Clear Lake
Randall, O. S.	Watertown
Richards, Geo.	Watertown
Rousseau, M. C.	Watertown
Sherwood, H. W.	Doland
*Tarbell, H. A.	Watertown
Vaughn, J. B.	Castlewood

MADISON DISTRICT No. 3

PRESIDENT
Jordan, L. E. — Chester

SECRETARY
Baughman, D. S. — Madison

Baughman, D. S.	Madison
*Butler, C. A.	Lake Preston
Davidson, Magni	Brookings
Drobinsky, Miguel	Estelline
Engleson, C. J.	Brookings
Grove, E. H.	Arlington
Gulbrandsen, G. H.	Brookings
Hopkins, N. K.	Arlington
Jordan, L. E.	Chester
Kellogg, H. E.	Brookings
Madsen, Mars. L.	Canova
Miller, H. A.	Brookings
Mokler, V. A.	Wentworth
Muggly, J. A.	Madison
Orvedahl, F. W.	Lake Preston
Peeke, A. P.	Volga
Sherwood, C. E.	Madison
Tank, M. C.	Brookings
Tillisch, H.	Brookings
*Torwick, E. E.	Volga
Torwick, E. T.	Volga
Watson, E. S.	Brookings
Westaby, J. R.	Madison
Westaby, R. S.	Madison
Whitson, G. E.	Madison
Willoughby, F. C.	Howard

PIERRE DISTRICT No. 4

PRESIDENT
Salladay, I. R. — Pierre

SECRETARY
Morrissey, M. M. — Pierre

Burgess, R. E.	Gettysburg
Collins, E. H.	Gettysburg
Creamer, F. H.	Dupree
Dyar, B. A. FSA.	Indianapolis, Indiana
Hart, B. M.	Onida
Kimble, O. A.	Murdo
Martin, H. B.	Harrold
Morrissey, M. M.	Pierre
Murphy, Joseph	Murdo
Northrup, F. A.	Pierre
Ramsey, Guy	Philip
Riggs, T. F.	Pierre
Robbins, C. E.	Pierre
Salladay, I. R.	Pierre
Van Heuvelen, G. J.	Pierre

HURON DISTRICT No. 5

PRESIDENT

Class, F. L. ..... Huron

SECRETARY

Lenz, B. T. ..... Huron

Buchanan, R. A. ..... Huron
Burman, G. E. ..... Carthage
Class, F. L. ..... Huron
Cogswell, M. E. ..... Wolsey
*Foxton, J. L. ..... Huron
Griffith, W. H. ..... Huron
*Grosvenor, L. N. ..... Huron
Hagin, J. C. ..... Miller
Hofer, E. A. ..... Iroquois
Lenz, B. T. ..... Huron
Pangburn, M. W. ..... Miller
Saxton, W. H. ..... Huron
Saylor, H. L. ..... Huron
Sewell, H. D. ..... Huron
Shirley, J. C. ..... Huron
Tschetter, J. S. ..... Huron
Tschetter, Paul ..... DeSmet
Wright, O. R. ..... Huron

MITCHELL DISTRICT No. 6

PRESIDENT

McGreevy, J. V. ..... Mitchell

SECRETARY

Jones, J. P. ..... Mitchell

Auld, C. V. ..... Plankington
Ball, W. R. ..... Mitchell
Beukleman, W. H. ..... Stickney
Bobb, B. A. ..... Mitchell
Bobb, C. S. ..... Mitchell
*Carrow, R. H. ..... Ft. Thompson
Delaney, Wm. A. ..... Mitchell
Dick, L. C. ..... Spencer
Farnsworth, C. P. ..... Chamberlain
Gifford, A. J. ..... Alexandria
Gillis, F. D. ..... Mitchell
Jones, E. W. ..... Mitchell
Jones, J. P. ..... Mitchell
Kelley, R. A. ..... Mitchell
Lloyd, J. H. ..... Mitchell
McGreevy, J. V. ..... Mitchell
Mabee, D. R. ..... Mitchell
Mabee, O. J. ..... Mitchell
Maytum, W. J. ..... Alexandria
Reib, W. G. ..... Parkston
Tobin, F. J. ..... Mitchell
Tobin, L. W. ..... Mitchell
Vollmer, F. J. ..... Howard
Weber, R. A. ..... Mitchell
*Young, E. M. ..... Mitchell

SIOUX FALLS DISTRICT No. 7

PRESIDENT

Nilsson, F. C. ..... Sioux Falls

SECRETARY

Hummer, H. R. ..... Sioux Falls

Billingsley, P. R. ..... Sioux Falls
Billion, T. J. ..... Sioux Falls
Brandon, P. E. ..... Sioux Falls
Carney, Myrtle S. ..... Sioux Falls
Clark, James C. ..... Sioux Falls
Cottam, G. I. W. ..... Sioux Falls
*Craig, D. W. ..... Sioux Falls
Culver, C. F. ..... Sioux Falls
Dehli, H. M. ..... Colton
DeVall, F. C. ..... Garretson
Donahoe, S. A. ..... Sioux Falls
Donahoe, W. E. ..... Sioux Falls
Duimstra, Fred ..... Sioux Falls
Dulaney, C. H. ..... Canton
Eagan, J. B. ..... Dell Rapids
Engelcke, R. H. ..... Viborg
Erickson, E. G. ..... Sioux Falls
Erickson, O. C. ..... Sioux Falls
Gage, E. E. ..... Sioux Falls
Gregg, J. B. ..... Sioux Falls
Groebner, O. A. ..... Sioux Falls
Grove, A. F. ..... Dell Rapids
Hanson, O. L. ..... Valley Springs
Hoyne, A. H. ..... Salem
Hummer, H. R. ..... Sioux Falls
Hyden, Anton ..... Sioux Falls
Keller, S. A. ..... Sioux Falls
Kemper, C. E. ..... Viborg
Kittleson, J. A. ..... Sioux Falls
Lamb-Barger, Hazel ..... Sioux Falls
Lanam, M. O. ..... Sioux Falls
Larsen, M. W. ..... Hudson
Leraan, L. G. ..... Sioux Falls
McDonald, C. J. ..... Sioux Falls
Mueller, J. D. ..... Flandreau
Mullen, R. W. ..... Sioux Falls
Nessa, N. J. ..... Sioux Falls
Nilsson, F. C. ..... Sioux Falls
Opheim, O. V. ..... Sioux Falls
Pankow, L. J. ..... Sioux Falls
Parke, L. L. ..... Canton
*Posthuma, Anne ..... Sioux Falls
Reagan, Resin ..... Sioux Falls
Rider, A. S. ..... Flandreau
*Roberts, W. P. ..... Sioux Falls
Sercl, W. F. ..... Sioux Falls
Stenberg, E. S. ..... Sioux Falls
Stevens, G. A. ..... Sioux Falls
Stevens, R. G. ..... Sioux Falls
Van Demark, G. E. ..... Sioux Falls
Volin, H. P. ..... Lennox
Zellhoefer, H. W. K. ..... Sioux Falls
Zimmerman, Goldie ..... Sioux Falls

YANKTON DISTRICT No. 8

PRESIDENT

Haas, F. W. ..... Yankton

SECRETARY

Hohf, J. A. ..... Yankton

Abts, F. J. ..... Yankton
Adams, G. S. ..... Yankton
Andre, H. C. ..... Vermillion
Ash, J. C. ..... Lake Andes
Blezek, F. M. ..... Tabor
Brookman, L. J. ..... Vermillion
Bury, C. F. ..... Geddes
Bushnell, J. W. ..... Elk Point
Bushnell, W. F. ..... Elk Point
Conner, E. I. ..... Alcester
*Cruickshank, Thos. ..... Vermillion
Fairbanks, W. H. ..... Vermillion
Frehour, Ina Moore ..... Yankton
Giedt, W. R. ..... Vermillion
Haas, F. W. ..... Yankton
Hansen, H. F. ..... Vermillion
Hohf, J. A. ..... Yankton
Hohf, S. M. ..... Yankton
Johnson, G. E. ..... Yankton
Joyce, E. ..... Hurley
Kalayjian, D. S. ..... Parker
Kauffman, E. J. ..... Marion
*Keeling, C. M. ..... Springfield
Lacey, V. I. ..... Yankton
Landman, G. A. ..... Scotland
Leonard, B. B. ..... Yankton
Lietzke, E. T. ..... Beresford
Moore, F. A. ..... Yankton
Morehouse, E. M. ..... Yankton
Murphy, J. C. ..... Yankton
Neisius, F. A. ..... Platte
Reding, A. P. ..... Marion
Smith, A. J. ..... Yankton
Stansbury, E. M. ..... Vermillion
Trierweiler, J. E. ..... Yankton
Willhite, F. V. ..... Redfield
Williams, F. E. ..... Wakonda

BLACK HILLS DISTRICT No. 9

PRESIDENT
Mills, G. W. — Wall

SECRETARY
Jernstrom, R. E. — Rapid City

Bailey, S. G.	Hot Springs
Bestgen, Fred P.	Rapid City
Bilger, F. W.	Hot Springs
Butler, J. M.	Hot Springs
*Christen, P. C.	Hot Springs
Clark, B. S.	Spearfish
Clark, O. H.	Newall
*Cramer, L. L.	Hot Springs
Crane, H. L.	L'Oyra, Peru
Davidson, H. E.	Lead
Davis, J. H.	Belle Fourche
Dawley, W. A.	Rapid City
Dickinson, J. H.	Buffalo
Doan, D. I.	Edgemont
Doyle, J. I.	Rapid City
Ewald, P. P.	Lead
Fleeger, R. B.	Lead
Fuchlow, J. R.	Rapid City
Geyerman, P. T.	Hot Springs
Hare, Carlyle	Spearfish
Hayes, P. W.	Hot Springs
*Hill, H. R.	Custer
*Homan, R. W.	Fort Meade
Howe, F. S.	Deadwood
Hultz, E. B.	Hill City
Hummer, F. L.	Lead
Ince, H. J. T.	Rapid City
Jackson, A. S.	Lead
Jackson, R. J.	Rapid City
Jernstrom, R. E.	Rapid City
Kegaries, D. L.	Rapid City
*Kenner, E. B.	Deadwood
Ketchum, P. V.	Rouboix
Lemley, R. E.	Rapid City
*Martin, Rudoy	Custer
Matlock, W. E.	Deadwood
*Mattice, Eugene	Hot Springs
Mattox, N. E.	Lead
Merryman, M. P.	Rapid City
*Migdoll, David	Rouboix
Mihran, M. K.	Rapid City
Mills, G. W.	Wall
Minty, E. W.	Rapid City
Minty, F. W.	Rapid City
Morse, W. E.	Rapid City
Morsman, C. F.	Hot Springs
Newby, H. D.	Rapid City
*Nyquist, R. H.	Fort Meade
O'Toole, T. F.	New Underwood
Pemberton, M. O.	Deadwood
Radusch, Freda J.	Rapid City
Richards, F. A.	Sturgis
*Roadruck, R. D.	Hot Springs
*Roberts, F. J.	Hot Springs
*Roberts, W. B.	Custer
*Robertson, W. M.	Custer
*Schultz, Samuel	Hot Springs
*Scott, T. G.	Hot Springs
*Shearer, J. A.	Hot Springs
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The Administration of School Health and Physical Education as an Integrated Unit*

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New York City

IN a paper of this length it would be fruitless to discuss methodologies. We shall therefore attempt to present certain policies which should, we believe, subtend the administration of the school and its physical education department into an integrated unit. It is permissible therefore to base the argument upon what are taken to be primary needs.

The first of such needs is a director or administrator who understands what health is, and whose conception does not consist in rhetorical or definitive verbalizing, but recognizes that health is a *Gestalt* which is a resultant arising out of many variables, physiological, genetic, environmental and pathological.

Secondly, it is essential that our administrator be an individual of intellectual breadth, sufficient at least to recognize that there are many kinds of health. Among the most important might be listed personal, economic, social, military, cross-sectional or local, and longitudinal or non-geographical health. Looked at from such an angle, health becomes a serious duty of the school to the state. A sick citizenship cannot fight, cannot survive in peace or produce an enviable Culture. There are good reasons why the Finns have held off the Russians against "impossible" odds. Among these could be men-

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tioned the quality of symmetrical health for which the Finns are famous. It is an instance of sick or unsymetrically healthy men, the Russians, fighting men who have adopted the Greek pattern of a perfect body as a tool for a free mind. Yes indeed, the battle does not *always* go to numbers in this world! Quality is still a factor which must come into the reckoning.

Thirdly, our administrator should recognize that if the first two propositions are true (and let him dare deny them), it will follow that he must surround himself with an educationally minded staff. He must understand that the mind and the body can not be split asunder and that the former should serve as a tool and elaborator of the latter. He must realize that therefore, as a minimum, three things will be necessary, each interacting with the other: the school, a department of physical education and an educationally minded medical unit.

Fourth, it is suggested that if either the administrator, the school, the physical education department or the medical staff fail fully to comprehend propositions one, two, and three, the curriculum will be incomplete and probably inadequate to a degree which is exactly commensurate with such failure of comprehension.

Fifth, in the light of the above propositions, there is therefore a definite need for a special type of doctor in educational work, and the professional schools should recognize this obligation to society.

The ordinary medical specialist, for example, will most probably not be animated by a general socio-economic or educational interest. The school, on the other hand, needs medical men who understand that there is a difference between physical education and "physical culture," who recognize that adequately controlled physical activity is health, power and skill-building, is indeed educative and that it creates a widened facility and contact with reality. The school especially needs physicians who understand that an adequate physical education program is therapeutic in effect and can be used not only to enhance scholarship and solve psychological problems but to fashion a more interesting life for the handicapped and crippled.

Sixth, because the foregoing considerations are taken to be true, it is essential that the school men, the physical educators and the doctor learn to understand and trust each other, and that they acquire at least the nucleus of a common language so that they may freely exchange ideas. The school and the physical education department should accordingly attempt, through their own medical staff if they have one, or if they have not, through the agency of the administrator, to ally themselves with the local department of health, county medical society, public clinics and the like. In this way, a broadened platform of service and a mutually beneficial and educative goal may be attained.

The physical educator is after all, whether he likes it or not, a health officer, for in activity he is observing the performance of functional health problems. He should, it is felt, be qualified to recognize danger signals and to know when a certain individual should receive special study and diagnostic analysis. He should therefore have welcome entree to medical and surgical clinics. He depends upon the doctor for *diagnosis, prognosis* and *directed therapy*. The doctor depends upon him to carry out suggestions and to recognize, in the front lines of action, the beginning of trouble.

Seventh, as mentioned above, the modern administrator should have a place in his school for special classes in which the handicapped may be segregated. This is of advantage to all concerned. In such classes, where cardiacs, pulmonary cases, post infantile cases, the feebleminded and many other pathological types may be grouped, special and remedial techniques will be indicated both scholastically and from the standpoint of physical education. All such guidance should be under a specially qualified physician, and both the physical education department and the school should be guided in its curriculum emphasis, personnel selection, etc., by such medical supervision in the interest of accomplishing a constructive and conservation program.

Eighth, with the above points as a working nucleus, an integrated school and physical education department are bound to accrue; and with this, certain other objectives will be gained. Among these will loom large the achievement of a better and richer life for more children. But what is more important, these children will be better prepared to face the growing challenge of a world now reeling in the delirium of madness.

If there ever was a time when education stood before the world challenged and accused, it is now. The time has passed when we can afford to quibble. We must do something and what we do may decide the doom or the salvation of tomorrow. We need programs that are built upon a rock and we need leadership of quality.

This little paper is only one man's view. It perhaps demands too much. But the program here outlined could be carried out as a unit. It is compounded of schema which have already worked. It could, we believe, be successfully executed as an entirety, and beside furnishing a tremendous challenge to all concerned, it would certainly pay dividends.

Roentgen Analysis of the Pelvis in Pregnancy

With Some Observations on Technic

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DURING recent years the roentgen ray has been used increasingly in obstetric diagnosis. A number of methods for measurement of the pelvic and fetal head diameters have been reported and, in general, the relative accuracy of these roentgen determinations is accepted. A more recent trend in obstetric diagnosis has been the recognition of certain standards of pelvic shape or architecture. Caldwell and Moloy[1] have suggested four basic types of pelvic shape; they have shown that important relationships exist between pelvic configuration, the mechanism of descent and the optimal mechanism of delivery.[3,4,5,6] Since it is, as yet, impossible to state that there is a positive correlation between pelvic measurements and the ease or difficulty to be expected in labor, it appears that the maximum of helpful information will be gained from analyses of pelvic shape and its correlation with the optimal mechanics of labor.

Study of Pelvic Shape

Anatomic variations in pelvic structure have long been recognized.[9,10] In pointing out the relation of pelvic shape to labor, Caldwell and Moloy have recalled attention to four pelvic types based primarily on the shape of the inlet: the round (gynecoid), the longitudinal oval (anthropoid), the transverse oval (platypelloid), and the wedge shape (android). In analyzing inlet characteristics along the lines suggested by these authors, it is important to divide the inlet into a posterior and anterior segment by means of the transverse inlet diameter. The shape of the posterior segment is the actual basic factor in classification and, while the typical types have characteristic anterior segments, variations in the anterior segment produce a great number of deviations from the basic types. The distance of the transverse diameter from the sacral promontory or the width of the posterior sagittal, and the size and shape of the sacro-sciatic notch are more important factors in classification than the relationship of the length of the widest transverse diameter to that of the anteroposterior diameter of the inlet. Thus, in the characteristic gynecoid type of inlet the posterior sagittal is relatively long, the sacro-sciatic portion of the posterior segment is wide and gently curved, and the anterior segment (pubo-iliac portion) forms a similar smooth curve. The android inlet has a short posterior sagittal, which means that the transverse diameter is close to the sacrum, the sacro-sciatic notches are sharply angulated, and the anterior segment is narrow and angulated. The relationship of the length of the anteroposterior to the transverse diameter, however, is not an outstanding feature. The anthropoid, or long oval inlet, has a long posterior sagittal, the sacro-sciatic notches describe a long curve, the anterior segment is long and curved, and the transverse diameter is smaller than the anteroposterior. The platypelloid, or flat inlet, is characterized by a long transverse diameter, which is located well in front of the sacral promontory; the sacro-sciatic notch is foreshortened but broad, while the anteroposterior diameter is short. These variations in inlet shape are to be carefully observed since they exert a maximum influence on the position of the fetal head as it enters and begins its descent into the pelvis. For example, the sagittal suture will usually occupy the anteroposterior diameter in the long oval inlet; while, in the transverse oval or flat type, this suture usually occupies the transverse diameter.

Equally important are the variations in the lower pelvis which occur independently of the inlet shape and which are intimately related to the mechanism of labor.

The length of the anteroposterior diameter of the pelvis at these various lower pelvic levels may increase or decrease depending on variations in the sacral curvature and inclination posteriorly, or on the posterior angulation of the pubic rami anteriorly. Similarly the transverse diameters below the inlet undergo variations in length due to convergence or divergence of the side walls, and to variations in the length and shape of the ischial spines. The shape of the sub-pubic arch may alter the anterior portion of the outlet, independently of the shape of the outlet posteriorly, while variations in the curvature of the sacral tip and coccyx affect the shape of the posterior segment of the outlet irrespective of the conditions anteriorly. Thus the birth canal, when viewed either from the front or side, may show a progressive decrease or increase in size from inlet to outlet, while the anterior and posterior outlet segments may vary independently of each other. These lower pelvic variations may result in a mid-pelvic or an outlet shape that is entirely unrelated to the inlet shape, and therefore the diameters most efficiently utilized may be the direct opposite of those occupied at the inlet.

It is, therefore, necessary to formulate a clear-cut conception of mid-pelvic and outlet shape and capacity since they are of the greatest concern to the obstetrician in predetermining the most efficient mechanism of labor. In evaluating mid-pelvic and outlet capacity, it should be remembered that the relative length of the interspinous diameter and the space in front and behind (anterior and posterior sagittal diameter at level of the spines) are the important features at the level of the spines. At the outlet, the distance of the sacral tip below and behind the spines is the important feature posteriorly, while the length of the inter-tuberous diameter and its distance in front of the sacral tip, together with the sub-pubic arch shape, formulate the essential features of anterior outlet capacity.

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Caldwell and Moloy have pointed out the significance of these various features of pelvic shape in the normal mechanism of labor.[1] They have also shown that in each pelvic type characteristic mechanisms take place and, if forceps application becomes necessary, the optimal mechanics to be employed are closely correlated with the particular pelvic shape.[6] These observations based on repeated roentgen examinations during labor are briefly summarized in the following paragraphs.

The gynecoid pelvis is taken as an example of the normal mechanism of labor in a spontaneous delivery, while the three remaining types serve as examples of how recognition of pelvic shape enables labor to be conducted most efficiently.

Gynecoid pelvis. The head most frequently enters the pelvis in a transverse or near transverse asynclitic position, the sagittal suture being directed toward the fore pelvis. Under influence of the lower uterine segment a posterior lateral flexion occurs during descent which directs the head into a more posterior transverse position near the sacrum. Transverse descent continues posteriorly until, at the level of the ischial spines and lower sacrum and coccyx, the head is directed anteriorly coincident with rotation. With rotation completed, descent and flexion in the fore pelvic proceeds until the biparietal diameter occupies the inter-tuberous diameter, at which time the act of extension begins. When extension begins, the occiput has partially passed through the sub-pubic arch and the upper portion of the arch is actually occupied only by the neck of the fetus late in the stage of extension.

Flat pelvis. In the flat pelvis the longest diameter of the head usually occupies the longest pelvic diameter, and a transverse head position is therefore typical. Since this flat or transverse oval pelvic shape is usually maintained throughout the pelvis, the head should be allowed to descend to the pelvic floor in this same transverse plane. The straight posterior and anterior pelvic walls act to prevent a high forced rotation to an anterior position because of the close relationship of the temporal bones to the sacrum and pubic rami. If forced rotation is attempted, cranial injury to the child or spreading of the symphysis pubis may result. In the case of a deep transverse arrest, therefore, the head should be brought down in the transverse position to a low pelvic level before anterior rotation is attempted. The head must be low enough to insure removal of the effect of the flat anterior and posterior inlet walls and to allow the occiput to occupy the outlet space behind and below the subpubic arch and pubic rami. At this level, anterior rotation can usually be accomplished.

Android pelvis. Since the transverse diameter is close to the sacrum and the anterior segment is sharply angulated, the head usually enters in a transverse position close to the sacrum. This apposition to the sacrum creates a situation very similar to that of the flat pelvis, especially at the inlet. If the side walls are straight, this flat influence is carried down through the pelvis. If the anteroposterior diameter is relatively long, the head may assume a posterior oblique position. In the true android type, however, descent takes place in the transverse position. The progressive convergence, prominent spines and narrow sub-pubic arch usually met with, are very prone to produce a transverse arrest at the level of the spines. The narrow posterior segment does not permit rotation for the same reason described under the flat pelvis. Further descent posteriorly is interfered with by the narrow interspinous diameter. In this situation the head must be deviated from its position in the posterior segment at the spines and brought anteriorly into the fore-pelvis while still in a transverse position. This maneuver, termed anterior lateral flexion, can be accomplished by using Barton's forceps. The obstruction offered by the spines and lower sacrum having been obviated, further transverse descent with spiral rotation may be accomplished low in the anterior segment. In cases of unusual convergence with prominent spines and a sharply angulated sub-pubic arch, the necessary space is not present and pelvic delivery is usually impossible. The android pelvis is a particularly unfavorable one and, in records of operative deliveries, the incidence of android types shows a significant increase over that found in spontaneous deliveries.

Anthropoid pelvis. The inlet shape is practically the direct opposite of the flat type; and the head, therefore, more frequently enters the pelvis with the sagittal suture occupying the anteriorposterior or an oblique diameter. Since the transverse diameters are characteristically narrow, descent must continue in either an occiput anterior, posterior, or oblique position to a low level. A posterior arrest may occur at a low level, but mid-pelvic posterior arrests are not characteristic complications. Attempted or natural anterior rotation is counteracted by the narrow transverse diameters. The head may, therefore, be delivered most efficiently in a direct occiput posterior or anterior position. With posterior arrests at low levels, however, anterior rotation is often accomplished by forceps application, with posterior descent to lower levels, until the caput is in sight, at which level sufficient space is often available to permit rotation. If the sacrum is curved forward, this low descent may not be accomplished, and rotation may be possible only after elevation of the head to higher levels.

In addition to the predominating pelvic shape, the position of the axis of fetal descent is an important factor in the course of a normal or forceps delivery.[5] (figs. 2 and 4, A and B.) An efficient delivery presupposes the fetus is directed through the pelvis in a manner permitting utilization of the most spacious pelvic parts. Variations in the axis of descent occur, however, due to changes in the directing influence of the lower uterine segment and its fascial supports. In the normal mechanism the axis of descent follows the sacral curve of the posterior segment. However, the axis may be situated anteriorly or in the mid-pelvis, and the head may, therefore, descend in the anterior segment or in the middle of the pelvis. The axis of descent is accordingly intimately related to the mechanism of labor and an unusual location of the axis may account for dystocias that cannot be explained on the basis of pelvic shape alone. A knowledge of the location of the axis of

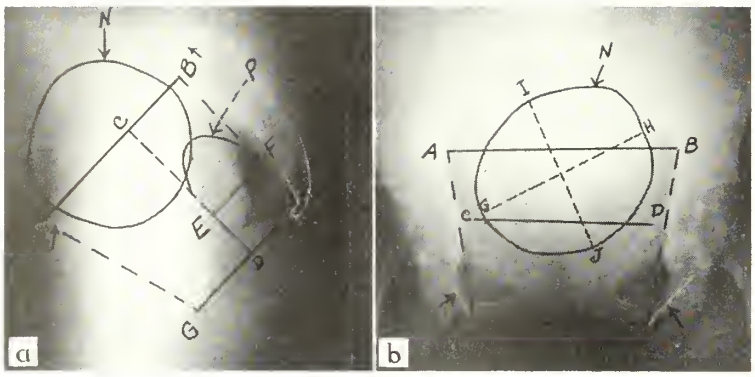

Fig. 1

Fig. 1. Pelvic and cephalic measurements available from single A.P. and lateral films.

(a) **Lateral Projection:** A-B, first obstetric pelvic plane of pelvis. Arrows at A and B indicate lines important in establishing end-points. C-D, perpendicular to A-B through ischial spines at E, establishes coronal plane from which anterior and posterior sagittals originate. E-F, posterior sagittal at the level of the spines. D-H, posterior sagittal at the level of the sacral tip. G-H, anteroposterior diameter at outlet. E-D, distance of plane of sacral tip below plane of spines. Area E-D-H-F, an important index of posterior outlet capacity. N, circumference of fetal head determined by use of map measure.

Centimeter scale (S) on the right permits direct correction of all mid-sagittal measurements or correction factor for distortion may be quickly determined.

(b) **A.P. Projection:** A-B transverse, C-D interspinous, and E-F intertuberous diameters directly measurable, but which must be corrected for distortion. G-H, I-J, right-angled diameters of skull which may be used for computation of skull circumference.[5] Lines A-E and B-F indicate convergence of side walls. Arrows over ischial tuberosities indicate "white line," on which (at point of crossing of broken line continued down from posterior margin of obturator foramen) are established end-points for intertuberous diameter.

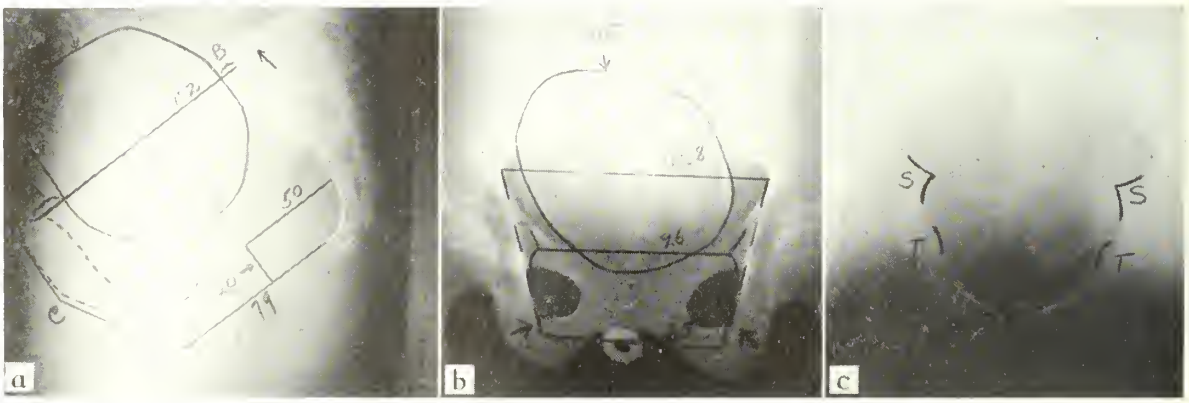

Fig. 2

Fig. 2. (a) lateral standing; (b) A.P. standing; (c) inlet view. A gynecoid posterior segment, an android anterior segment of the inlet, with converging lateral side walls, short interspinous and intertuberous diameters, and a narrow sub-pubic arch in a generally small pelvis. Entire anterior pelvis from inlet to outlet is relatively contracted. Note projection of the spines (S) and ischial tuberosities (T) into lower pelvis. The posterior pelvis is of average capacity but the sacral tip curves acutely forward, decreasing the outlet space. Posterior angulation of pubic rami (C) decreases the anterior outlet space.

The head occupies a mid-pelvic axis of descent (compare A and B). The average corrected head circumference is 30.5 cm. indicating a fetal age of 37 weeks. Neither the bi-parietal or occipito-frontal diameters is parallel to the film, hence cannot be accurately measured. Arrow over first sacral vertebra indicates iliopectineal line crossing anterior margin of first sacral vertebra representing the posterior end-point of the anteroposterior diameter of the inlet.

Clinical diagnosis: "Funnel" pelvis.

Delivery by: Cesarean section.

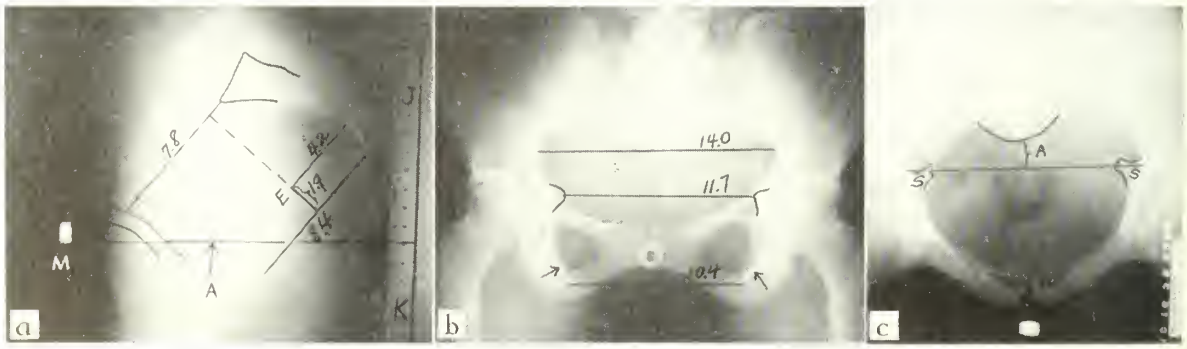

Fig. 3

Fig. 3. (a) lateral standing; (b) A.P. standing; (c) inlet view. A flat or "transverse oval" type of pelvis. Note the transverse oval inlet shape, the relatively wide sacro-sciatic notch, the long transverse and the very short anteroposterior inlet diameters. A "rachitic influence" is indicated by the shape of the sacrum which is practically straight and directed backward, and by the deep indentation of the promontory into the inlet space. Note in the inlet view that the distance from the transverse diameter to the promontory (A) is very short, the widest transverse diameter is directly above the ischial spines (S). The backward sacrum creates an unusually large anteroposterior outlet diameter. This pelvis is fairly spacious except for the extremely short anteroposterior inlet diameter, which very probably will not allow the head to enter the pelvis. Note circular metallic marker on skin at level of the symphysis pubis (A.P. view). Distance A from marker M to table top (directly measured in A.P. position) laid out (corrected for distortion) on lateral film establishes theoretical plane of table top (J-K). Distance of fetal skull diameters or transverse pelvic diameters, for example E (ischial spines) from table top may be directly measured and corrected

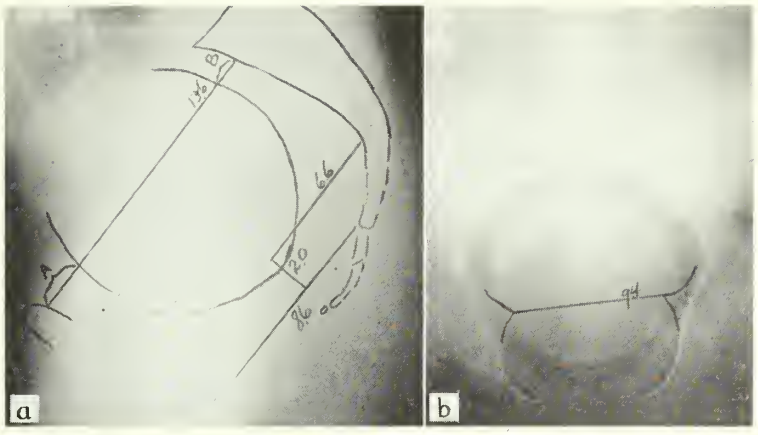

Fig. 4. (a) Lateral standing; (b) A.P. standing. While not a characteristic anthropoid inlet, this pelvis has predominating anthropoid features. Upper pelvic anteroposterior diameters relatively long, mid-pelvic and outlet transverse diameters relatively short. Head is shown in a transverse position at level of spines, at which level further descent did not occur after 48 hours of labor. Manual rotation impossible. With forceps, rotation was completed by anterior lateral flexion, descent and spinal rotation to a direct occiput anterior position. Delivery followed immediately.

In an anthropoid pelvis, descent to low levels with the head in a transverse position usually does not occur since the transverse diameters are short, the anteroposterior diameters long throughout. In spite of relatively short transverse diameters, this type of pelvis may be an efficient one provided the shape is recognized and dealt with accordingly. (Note posterior axis of descent [compare a and b].)

Fig. 4

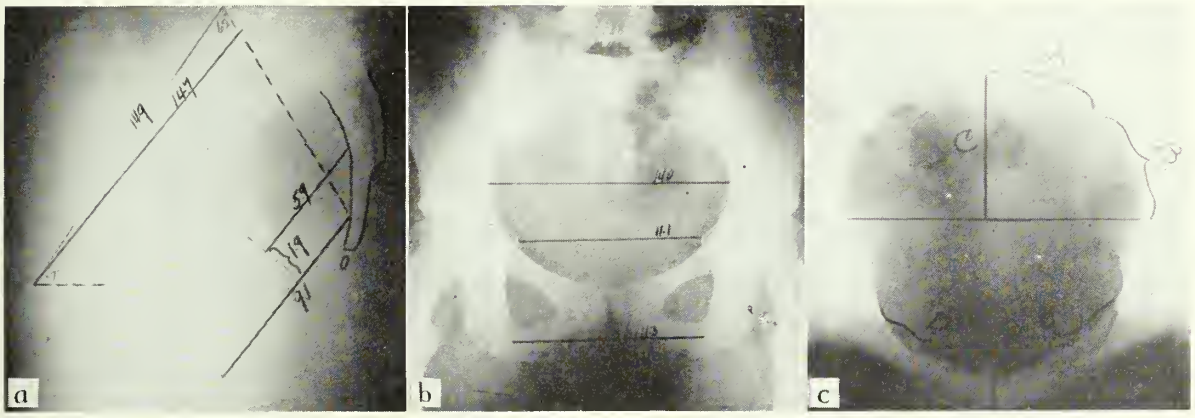

Fig. 5

Fig. 5. (a) lateral standing; (b) A.P. standing; (c) inlet view. A "gynecoid" or "round" type of inlet, in a generally large pelvis in which all measurements (except the distance between the level of the spines and the level of the sacral tip) are relatively long. Note long broadly curved sacroiliac portion of the posterior segment (A and B), the relatively long distance from the transverse diameter to the promontory (C), the round pubo-iliac portion of the anterior segment (D). In lateral view note the moderate forward curvature of lower sacrum, a variation and not a constant feature in this pelvic type. In the anteroposterior projection note how lower pubic rami deviate laterally, practically at right angles to symphysis, producing a wide intertuberous diameter.

descent, that is, whether the head is descending close to the sacrum, close to the symphysis, or in the mid-pelvis is, therefore, another essential that must be considered if the most efficient mechanics in labor are to be employed.

Observation of these various fundamental features of pelvic shape and the determination of the axis of descent, are in all probability the most important information that the roentgenologist can offer to the physician. In the vast majority of instances this phase of obstetric roentgenology far surpasses the value of accurate measurements in prognosticating the problems in labor.

Value of Pelvic Measurements

Internal pelvic measurements must receive separate consideration from external measurements, since, as Greulich and Thoms[8] and others have pointed out, practically no correlation exists between external and internal pelvic diameters. Some roentgen method of computation must, therefore, be employed if we are to have reliable and reasonably accurate measurements of the birth canal diameters. In spite of the ease and relatively high degree of accuracy with which they can be obtained, numerical values placed on these various diameters have definite limitations in the insight they give concerning pelvic capacity. They are a distinct help in confirming impressions as to whether a pelvis is generally large or small, or whether a certain segment may be relatively contracted. Individual measurements considered alone, however, have a limited value as an index of capacity and, in the analysis of disproportion, may even be misleading. For example, soft tissue interposition or variations in soft tissue attachments may produce localized interference or misdirection of the presenting part, even if the bony diameters are relatively long.

Fig. 6. Calibrated metallic marker for use in upright lateral projection.

Malleability of the fetal head and pliability of pelvic joints, variables about which little can be forecast, also combine to make a prediction of disproportion based on numerical values alone open to serious question. A further objection to reliance on measurements alone is the considerable variation between minimum and maximum values in any given group of cases. It is difficult, if not impossible, to establish a normal or average value for any one diameter in any particular pelvis. Obviously the size and shape of the maternal pelvis and the relative size of fetus must be jointly considered when an attempt is made to evaluate basic measurements. For these various reasons, measurements in themselves are of limited value and offer a number of prognostic pitfalls. The conclusions one may draw from any particular set of measurements alone, such as whether dystocia or forceps application is to be expected, or whether a cesarean section must be done, are therefore rarely, if ever, valid. When combined with a knowledge of the shape and of the pelvic features influencing capacity, however, the maximum information concerning both disproportion and the optimal mechanics to be employed is available.

Even a complete pelvic analysis does not allow a safe prediction of forceps delivery, since an apparently adequate bony pelvis occasionally will require a forceps delivery. Similarly, in the presence of an apparent fetal head-pelvic disproportion, a rapid and easy delivery may eventuate. While these irregularities in prediction are not the rule, we are left with the conclusion that the most accurate information to be gained from pelvic studies is that concerning the optimal mechanical method of delivery to be employed, if and when spontaneous delivery cannot be accomplished.

Technic of Roentgen Determination of Pelvic Measurements

The theoretical computation of pelvic measurements is a relatively simple procedure. If the distance from any parallel plane to the film is known, the distorted diameter as measured on the film can be corrected by applying a factor, which is determined from the following formula: $\frac{\text{T.F.D.} - \text{O.F.D.}}{\text{T.F.D.}} = \text{X}$, where T.F.D. = target film distance, O.F.D. = object film distance, and X = the correction factor to be applied. This method of computation is frequently termed the "position" method, the position of the part to be measured relative to the film being the essential factor. Many methods of measurement are based on this fundamental relationship, including "perforated plate" methods in which the distortion is automatically corrected on the film.

If the shift of the image of a diameter, as measured on two superimposed stereoscopic films is known, then a correction factor can also be determined from the formula: $\frac{\text{T.S.}}{\text{I.S.} + \text{T.S.}} = \text{X}$, where T.S. = tube shift, I.S. = image shift, and X = the correction factor. This is called the "parallax" method, the measurement of parallax or image shift being essential. Stereoscopic methods of determining numerical values of various diameters are based on this relationship.

Thus, the distance of the part to be measured from the film is the essential factor in one case, while the degree of the shift of the image, and the tube, is the basis of the other. Whatever method of computation is used, one unavoidable source of error lies in the determination of definite bony end-points for certain diameters. This is particularly true of the transverse diameter of the inlet, and the diameters of the fetal skull; and it is occasionally true of the conjugata vera and interspinous diameters. An end-point on a curved bony surface, such as the fetal skull, cannot be determined with a high degree of accuracy. In "position" methods, a second important source of error is in the determination of the distance of movable parts (fetal head) from the film. After fixation of the head in the pelvis, however, this factor is of much less importance.

Technical Procedure

A thorough roentgen obstetric survey of the pelvis should permit a complete analysis of the important anatomic features influencing pelvic shape, as well as measurements of the inlet, mid-pelvic, outlet, and fetal head diameters. This necessitates the use of at least three projections, namely, anteroposterior, lateral, and inlet views. Stereoscopic anteroposterior films, combined with a lateral projection, will for practical purposes fulfill the requirements. Measurements will then have to be computed by means of a stereo-roentgenometer, such as described by Johnson,[13] a direct measuring stereoscope as described by Caldwell, Moloy and Swenson,[11] or by means of planeography and localization as described by Kaufman.[15] The shape and measurements can, however, be easily determined from single anteroposterior, lateral, and inlet view films, following the suggestions of Ball[16] with modifications for establishing the distance of the various parts or diameters from the film.

The first projection undertaken should be the lateral, which can be done most efficiently in the standing position. With careful positioning of the patient, and by the use of a canvas binder, a high percentage of true lateral views will be obtained. True lateral views are obtained only with great difficulty in the recumbent position. A calibrated metallic marker (fig. 6) which may be adjusted on an upright rod, the base of which fits onto the footstand, is set opposite the genital crease on a level with the superior surface of the greater trochanter. The central ray is directed approximately 1 inch above and 1 inch behind the upper margin of the greater trochanter. Since the marker is in the mid-sagittal plane of the pelvis, the centimeter scale on the marker as viewed on the film (S, fig. 1) is distorted in the same degree as the mid-sagittal diameters. These mid-sagittal diameters, as later measured on the film, can be directly applied to the image of the centimeter scale, and a corrected reading will be the result. In order to determine the exact distance between the table top and any structure within the pelvis for the anteroposterior projection, it is necessary to set up an arrangement whereby the actual distance between the table top and

a fixed point on the patient can be later determined. This is done before making the lateral exposure, by placing a small metallic marker directly over the symphysis pubis in the mid-line, which is closely and firmly applied to the skin surface by means of tape (M, fig. 3). When the patient is later held firmly in the anteroposterior position by a canvas binder, the actual distance from this marker to the table top is carefully measured. This distance, increased by the distortion factor of the mid-pelvic plane, can later be laid out on the lateral film, extending from the image of the marker in front to its posterior termination which establishes the level of the plane of the table top for the anteroposterior projection. Since this plane is established, the distance from any of the transverse diameters of either the pelvis or fetal head to the table top in the anteroposterior projection can be directly measured and corrected on the lateral film. Thus the necessary data for establishing correction factors for each transverse diameter on the anteroposterior film is available.

The patient is now carefully turned through 90 degrees, the tube position remains unchanged, and the anteroposterior film is exposed.

The single inlet view should be projected in a manner that will produce an undistorted image of the inlet. This can best be accomplished if the patient assumes a semi-recumbent position, the back forming an angle of about 40 degrees with the table top, the central ray being directed perpendicularly midway between the symphysis pubis and sacral promontory. Satisfactory images of the inlet can also be obtained in the recumbent position by using a lumbar pillow of 10-centimeter thickness, as suggested by Garland.[11] In very large patients this method is probably the most satisfactory. The usual anteroposterior projection, either recumbent or upright, will not produce an inlet view that is satisfactory for classification of the inlet according to shape. The true shape of the pelvic inlet becomes apparent only when the superior and inferior rami are directly superimposed, in which case the obturator foramina are not visible.

All of the mid-sagittal diameters, the vertical distance between them, the circumference and occasionally the bi-parietal or occipito-frontal diameter of the fetal head, and the angle of inclination of the plane of the inlet can be directly measured and corrected on the lateral film. Likewise, the distance of the transverse diameters of the pelvis and fetal head from the table top in the anteroposterior projection can be easily measured and corrected.

The anteroposterior film permits accurate determination of the end-points of the intertuberous and interspinous diameters, and a fairly accurate estimate of the transverse diameter of the inlet. If the fetal head is fixed, then the circumference as measured in this projection will be the second of the right-angled views, thus enabling a fairly accurate estimate of the average circumference of the fetal skull. Occasionally the bi-parietal or occipito-frontal diameter can be measured depending on whether either plane is parallel to the film. Since the distance of each of these various planes from the table top has been established from the lateral film, the table top-film distance is added to each value, establishing the object-film distance for each diameter. Then by application of the above-mentioned formula, T.F.D. — O.F.D. ÷ T.F.D. = X (correction factor), the correction factor to be applied to each measured diameter is determined.

The inlet view is used primarily for a study of the shape of the inlet as an aid in placing the particular pelvis under consideration into one of the four basic structural types or into some variation thereof.

Fig. 1a represents the common diameters measurable and the various features that may be observed on the lateral film. The classic conjugata vera diameter, as described in textbooks, terminates posteriorly at the anterior superior margin of the promontory of the sacrum. Caldwell, Moloy and D'Esopo[4] have suggested a posterior termination which is less variable and more standard for all pelves; this point is at the level of the iliopectineal lines, usually on the lower anterior margin of the first sacral vertebra (B, fig. 1a). A perpendicular line (C-D) from this first plane (A-B) extending downward through the ischial spines divides the pelvis into anterior and posterior segments. Anterior and posterior sagittal diameters can be established by drawing lines at right angles to the coronal plane, and parallel to the first pelvic plane. The size and shape of the sacro-sciatic notch (P) is an important index of the capacity of the upper posterior segment. The posterior sagittal at the level of the spines (E-F) is a valuable index of the available space posteriorly in the mid-pelvis. The combined anterior and posterior sagittal diameters at the level of the tip of the sacrum (G-H) correspond to the available anteroposterior space at the outlet. The space (E-D-H-F) between the plane of the spines and the plane of the sacral tip behind the coronal plane is a good indicator of capacity in the lower posterior pelvis. The location of the sacral tip (H) with reference to the ischial spines, that is, the distance of the sacral tip behind and below the spines is especially important. A sacral tip that is situated high with reference to the spines produces a high posterior pelvic floor. This is an unfavorable structural feature since the available space anterior to this high posterior floor is restricted by the upper sub-pubic arch and symphysis pubis. The degree of posterior angulation of the inferior pubic rami behind the symphysis (C, fig. 2) is an important factor in determining lower anterior space since the greater the degree of angulation, the smaller the capacity in this area. The lines A-G and B-H (fig. 1) indicate the degree of convergence of the anterior and posterior pelvic walls. Since the patient is in a standing position, the degree of angulation of the plane of the pelvic inlet can be accurately and directly measured.

Fig. 1b demonstrates the diameters measurable on the anteroposterior film. A-B represents the transverse, C-D the interspinous, and E-F the intertuberous diameter. The endpoints for the intertuberous diameter are established by continuing the course of the posterior margins of the obturator foramina downward and forward to

the point where they cross the "white lines" on the inner aspect of the ischial rami. (See also, fig. 3.) Lines A-E and B-F represent the degree of convergence of the lateral side walls. The circumference of the fetal skull (N) in each projection can be determined by the use of a map-measure. The average of these corrected right-angled projection measurements can then be applied to a graph, as has been constructed by Hodges[12] for determining the fetal age in weeks. Similar graphs are available for the bi-parietal and occipito-frontal diameters.

The optimum time for the roentgen examination is during the two weeks previous to the expected delivery date. At this time the best possible correlation between head and pelvic size can be obtained. Roentgen studies can be carried out during the earlier months of pregnancy; in which case, however, the question of radiation effect on the fetus is often raised. There are no reports of any demonstrable injurious effect of radiation on the fetus following pelvic radiography. Nevertheless, the amount of radiation received by the more radio-sensitive fetal structures, such as the crystalline lens or gonadal tissues, is an important consideration.

In the two projections (A-P and L) suggested above, the patient of average size (32 cm. x 36 cm.) will receive a total of 20.5 "r", measured in air at the two skin surfaces. The "r" intensity was directly measured* by means of a "Victoreen" ionization chamber, and the factors were identical with those used in the two projections for average-sized patients.

It is, of course, impossible to compute the exact dosage received by any one part of the fetus. If it were assumed, however, that the most radio-sensitive fetal tissue were located 5 centimeters below the skin surface, and if the total dosage were given to one area, instead of two, then the estimated dosage received by this particular fetal structure would be 7 "r". This value represents the highest probable dose any part of the fetus could receive. At a depth of 10 centimeters below the skin, the dose would be 3.1 "r". Even with the addition of inlet and sub-pubic arch views, it seems highly improbable that the dose received by the well-developed fetus could be sufficient to have an injurious effect either present or remote.

The technical factors for the various pelvic projections vary with the size of the patient, the type of generating apparatus and the type of X-ray tube in use. We use a rotating anode tube with a 1 mm. focal spot, four valve tube rectification, a Bucky diaphragm and ultra-speed screens. For the patient of average size, near term, upright at a distance of 36 inches, with a peak kilovoltage of 82, a milliampere-second value of 150 has been found satisfactory for the anteroposterior projection. For the lateral projection, 325 milliampere-seconds is the average setting used; while for the inlet view at 30 inches, 150 milliampere-seconds is usually satisfactory.

*Made by Dr. I. Vigness, University of Minnesota Hospitals, deep therapy department.

SUMMARY

1. A knowledge of the fundamental features of pelvic shape is more helpful to the physician in the conduct of labor than are measurements of the various pelvic diameters.

2. A definite relationship exists between the shape of the birth canal, the mechanism of labor in spontaneous deliveries, and the optimal mechanics to be employed in forceps deliveries.

3. The position of the axis of descent is important since it may account for dystocias otherwise not explainable.

4. The question of ease or of difficulty in labor, or of the need for cesarean section cannot, in all cases, be determined from studies of pelvic shape or size.

5. If the shape of the pelvis is recognized, injury to the fetus or maternal pelvic structures, resulting from forceful attempts at rotation or descent in the face of bony obstruction, may be averted.

6. Measurement of the important bony diameters of the pelvis, and of the circumference of the fetal skull, can be obtained with a fair degree of accuracy by roentgen methods.

7. Measurements considered alone, irrespective of pelvic shape, are of limited value, except for establishing the relative size of the birth canal or for determining relative contraction in certain segments of the pelvis.

8. Any one short diameter may be of little significance in one particular pelvic type, but of great significance in other types.

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The Common Cold

An Evaluation of an Oral Vaccine Based on a Controlled Study

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THE acute, self-limited infection which attacks the mucous membrane of the upper respiratory tract, ordinarily lasting from seven to nine days, and frequently accompanied by serious complications, is popularly known as a "cold" and is a complex condition, not a clinical entity. An effort has been made to discard the term "cold" which has usually included those symptoms to which a specific name could not be attached, and to convey the meaning really intended, by the term "infection of the upper respiratory tract."

In a consideration of the prevention and treatment of the common cold with its present symptomatology, the question of cause immediately arises. Logical therapeutic approach should consist of efforts to prevent the entrance of the causative agent into the tissues, to increase resistance to attack of such agent, or to destroy it if it has already invaded the tissues.

At present, in spite of extensive study and investigation, information regarding the agent or agents responsible for the common cold is relatively meager. All investigations have consistently shown that a wide variety of bacteria are present in colds. This fact necessitates the assumption that either colds are not due to any specific organism but that symptoms which are recognized by that term can be produced by a large number of different bacteria, or that the specific cause has not yet been definitely identified.

There is much evidence to indicate that the etiologic agent is not really a bacterium, but a filtrable virus which may pass from one individual to another, and that without the virus the whole complex of infection of the upper respiratory tract ceases to exist. This means that the bacteria of the upper respiratory tract are of themselves powerless to initiate infection. If bacteria then, are not to be regarded as the causative agents of the common cold, they must be secondary invaders, even playing the major etiologic role in influencing the severity of the symptoms and producing numerous complications.

Present opinion is divided with respect to the use of vaccines for the prevention of the common cold. Some clinicians feel that vaccines definitely reduce the frequency of colds. Others believe that although the incidence of colds may not be reduced, the duration of colds is decreased. It is the opinion of others that the chief benefit from the use of vaccines is in the decreased incidence of complications.

If colds are initiated by a filtrable virus, and the symptoms are produced by bacteria acting as secondary invaders, it is conceivable that mixed bacterial vaccines will protect individuals against the attack of bacteria, and also against the filtrable virus if bacteria augment it in its invasive effects.

Since the subject is still controversial, it must be remembered that while protection afforded by either oral or parenteral vaccines is not certain[1,2] the same statement applies to the filtrable viruses.[3]

In recent years considerable interest has been aroused by the possibility of utilizing the oral route for prophylactic purposes, not only against intestinal bacteria, but against other general infections..

There is now some evidence of the value of oral vaccination against typhoid fever, and a recognized authority has stated that the use of peroral vaccine as a means of "preventive immunization" may be justifiable in those instances in which the subcutaneous method is not practicable.[4]

Several favorable reports of oral prophylaxis against the common cold have appeared in the literature. Thomson[5] and co-workers observed that specific agglutinins were formed to Pfeiffer's bacillus and that antitoxins appeared in the blood after oral administration of a killed carbolized symbiotic broth culture of Pfeiffer's bacillus. A mixed vaccine of Pfeiffer's bacillus, pneumococci (types I-IV), streptococci, M. catarrhalis and A. bronchitica produced agglutinins for pneumococci and for streptococci in addition to Pfeiffer's bacillus. Oral administration of the combined vaccine in a small number of cases indicated the practicability of the peroral method for prophylactic immunization against the various secondary pathogenic organisms associated with colds and influenza.

Rockwell[6] and his associates concluded from their extensive studies that a certain commercially available oral vaccine containing killed organisms of the respiratory group is very effective in preventing colds.

On the other hand, Diehl, Baker and Cowan[7] made a comparative study of the value of two orally and subcutaneously administered vaccines among college students and concluded that there was no evidence of benefit from the oral vaccine and only a relatively slight benefit from the subcutaneously administered vaccine.

The following report presents a carefully controlled clinical evaluation of oral prophylaxis against the common cold in which an attempt was made to eliminate, in so far as it was possible, many of the questionable factors in other similar studies, and to evaluate the results by some measurable standard. An attempt has been made to show the effect of an oral vaccine on the incidence, total days of illness, and severity of colds in an experimental group as compared to a control. Analysis of the data has revealed information regarding the period of protection against severe colds after taking the oral vaccine, the extent of the protection produced during epidemic periods of the common cold, and the duration of the protective period.

PRELIMINARY STUDY

During the academic year 1937-1938 a comparison of the effect of the administration of an oral vaccine on the incidence of the common cold and total days illness was made in a group of undergraduate students in attendance at Miami University. Oral vaccine was given to 325 of the students in the experimental group, and placebos to 224 students in the control group. The control group were unaware that they had received placebos.

The oral vaccine* employed consisted of tablets prepared from a selected group of recently isolated bacterial species chosen for their strong antigenic properties. Several strains of each organism are used to insure broad antigenicity. The tablets were enteric coated to prevent excessive digestion in the stomach and contained approximately 50,000 million killed organisms:

Pneumococci (D. pneumoniae) (Types I, II and III)	12,500 million
Micrococcus (Neisseria) catarrhalis	10,000 million
Influenza bacillus (H. influenzae)	10,000 million
Friedlander bacillus (K. pneumoniae)	5,000 million
Streptococci (mixed)	7,500 million
Staphylococcus aureus	2,500 million
Staphylococcus albus	2,500 million

Placebos of starch and sucrose were administered to the control group, and these were identical in size and color with the oral vaccine tablets.

One tablet was taken daily during the first week of the experimental period, and two tablets a week thereafter for at least seven weeks. The incidence of colds and total days illness over a thirty week period were reported weekly by the students. For comparison, each student furnished at the outset of the experiment his own estimate of the number of colds and total days illness he had customarily experienced. The clinical findings are summarized in tables I and II.

TABLE I.
Effect of Oral Vaccine on Incidence of Colds

	Experimental Group (Oral Vaccine)	Control Group (Placebos)
Number of Students	325	224
Average Number of Colds in Previous Seasons	5.17	3.31
Average Number of Colds During Experimental Period	2.53	2.84
Decrease in Number of Colds in Experimental Period	2.64 (51.0%)	0.47 (14.2%)

TABLE II.
Effect of Oral Vaccine on Total Days Illness from Colds

	Experimental Group (Oral Vaccine)	Control Group (Placebos)
Number of Students	325	224
Average Total Days Illness from Colds in Previous Seasons	58.3	37.4
Average Total Days Illness from Colds During Experimental Period	22.5	27.2
Decrease in Total Days Illness from Colds in Experimental Period	35.8 (61.4%)	10.2 (27.3%)

The season 1937-1938 was generally considered a mild one for colds; even the controls suffered a shorter period of time from colds than they had reported as customary. In spite of this fact, it is evident from the tables that in the group taking the oral vaccine there was a much greater reduction in the number of colds and in the total days illness. It was our general impression that the severity of the colds also was lessened in the oral vaccine group as compared to the controls, but no provision had been made to evaluate this finding quantitatively in the preliminary study.

A direct comparison of the average number of colds in the experimental and control groups during the test period is not justified because the past cold histories of the students show that the experimental group was made up of students who were much more susceptible to colds than were the controls. Instead it was necessary to compare the reduction in the number of colds and total days illness from colds in the two groups. The reliability of these figures depends on the accuracy of the student's memory of his cold history in previous years, which is open to question.

Accordingly it was decided to repeat the experiment the following year, insuring comparability of experimental and control groups by insisting on random distribution of vaccine tablets and placebos among all the students who presented themselves for the test. It was also decided to estimate and record the severity as well as the duration of each cold occurring during the test period.

PRESENT STUDY

Early in the fall of 1938 it was announced through the school paper and on various bulletin boards in the medical department that a clinical study, similar to the one of the previous year, was to be conducted to determine the effect of an oral vaccine on the incidence, total days illness and severity of the common cold. All students interested and willing to coöperate were asked to register with the medical department.

EXPERIMENTAL AND CONTROL GROUPS

Each student was carefully questioned regarding the average number of colds, the days illness and the symptoms he was accustomed to experience during the course of a year. He was given a physical examination with special attention to the condition of his chest, nasal sinuses, ears and throat. If the student was found to have pathologic disturbances in the ear, nose and throat he was immediately ruled out as a possible candidate for the clinical study on the common cold. This was done in order to include in the survey only those students who were accustomed to suffer from the common cold, and to exclude any pathologic cases with either mild, chronic or acute involvement in the upper respiratory tract. Those students with allergic tendencies were eliminated, as well as students who did not ordinarily suffer from colds.

The students finally selected for the clinical study represented a cold-susceptible group of approximately the same degree of susceptibility, and free from any detectable allergic or pathologic influences. While 378 students began the study, our results are based on the records of

*This investigation was made possible through the courtesy of the Wm. S. Merrell Company, Cincinnati, who placed large quantities of oral vaccine tablets at our disposal for clinical evaluation and who contributed toward the expense of the investigation.

Report for week beginning Sunday, ---------- (date)

Cold: Date of onset: ----------
Continued from previous week, (--) yes, (--) no.

Days of cold this week: ----------
Severity: (--) mild; (--) moderately severe; (--) severe; (--) very severe
Symptoms: (--) nasal discharge (--) sputum (--) aching
(--) nasal obstruction (--) sore throat (--) in bed
(--) cough (--) fever Other----------
Medicine: Treatment other than the vaccine taken: ----------

Dates vaccine taken: ----------
Reactions: ----------
Comments: ----------

Date: ---------- Signature: ----------

Fig. 1. Weekly report card for data regarding respiratory infections.

338 who took the medication as instructed and who submitted accurate weekly reports for the entire test period.

Collection of Data

The basic idea of the clinical study and the importance of honest coöperation were explained to each student. Sufficient stamped and addressed cards (fig. 1) were given to each student to enable him to make a weekly report regarding his respiratory infections during the entire test period.

Weekly, as each student's card was received, the data on the cards were studied for discrepancies between the symptoms checked, severity of the infection and comments. Conflicting data appearing on these cards were checked by personal interview with the student.

Data from the weekly report cards were then transferred to the master card (fig. 2). This was done by student assistants.* Students who failed to mail in their weekly report cards regularly were contacted by the student assistants, in order that the data on the master card might be continuous, and not subject to inaccuracies of the student's memory.

Vaccine

Each student was supplied with a bottle containing 20 tablets, and he was instructed to take one tablet each day for the first week, then two weekly for six additional weeks. The tablets were to be taken at least a half hour before breakfast.

Both the bottles of oral vaccine and placebos (starch and sucrose) were distributed at random among the students who volunteered for the test, and under the system employed it was not possible for our student assistants purposely to supply their friends with the vaccine tablets in preference to the placebos. Nor did the student assistants who transferred the cold history from the weekly report cards to the master cards know which of the subjects had taken vaccine and which placebos. As a result of our vigilance, very closely comparable control and experimental groups were obtained. This statement is supported by the fact that the average number of colds per student per year prior to test period was 4.12 for the group which received placebos and 4.17 for the group which received vaccine.

The oral vaccine employed was identical with that used in the preliminary study, and is described above.

*The services of the student assistants are gratefully acknowledged.

Duration of the Experiment

The examination of the students and distribution of tablets was begun the third week of October, 1938, and continued for the next four to five weeks. The students began to report their cold history weekly as soon as they began taking the tablets, but in order that the results of the experiment should be evaluated only on the basis of a specific period for all the students alike, the data here reported begins November 21, 1938. At that time a few of the students had just begun taking the tablets, while a similar small number had started as long as five weeks previous. The average time which had elapsed from the day the first vaccine tablet was taken until November 21, when the cold report begins, was 18.5 days for the 185 students in the experimental group. There was about the same average interim between taking the first placebo tablet and November 21, but this figure is, of course, of no significance. Weekly cold reports were obtained from all of the students in the experiment up to April 23, 1939, and from most of them up to May 14, 1939.

Evaluation of Severity of Colds

A basis for the evaluation of the severity of colds similar to that used by Shibley and Spies[8] was adopted for the purposes of the experiment. Symptoms of a cold of twenty-four hours or less were not considered to constitute a true cold. Colds lasting longer than one day were classified as mild +, moderately severe ++, severe +++, or very severe ++++. The occurrence of nasal discharge and obstruction with or without cough, sputum or sore throat, lasting for more than one day, but without fever, aching, or confinement to bed was considered to constitute a "mild cold." Presence, in addition, of one of the symptoms (fever, aching, confinement to bed) defined a "moderately severe cold";

NAME

Address:

Age: Sex.

HISTORY:

Medical: Illnesses:

(__) Whooping Cough (__) Scarlet Fever (__) Bronchitis ( ) Typhoid Fever
(__) Measles ( ) Diphtheria (__) Influenza
(__) Mumps ( ) Pneumonia (__) Tuberculosis

Colds: Number of colds each year:
(__) 1 to 2 colds
(__) 3 to 4 colds
(__) 5 to 7 colds
(__) 8 or more colds

Average duration of colds:
(__) Less than 7 days
(__) 7 to 20 days
( ) 21 days or longer

Usual symptoms:
(__) Nasal discharge ( ) Sputum (__) Aching
( ) Nasal obstruction (__) Sore throat (__) In bed
(__) Cough ( ) Fever

Usual treatment:

Surgical:

Ear	drainage	mastoid	E. tubes	
Nose	septum	turbinates	polyps	
Throat	tonsil	abscess	adenoid	
Sinuses	drainage	lavage	radical	
	antrum	frontal	ethmoid	sphenoid

PHYSICAL EXAMINATION: Date: Findings:

1552

Previous cold vaccine: Form: Results:
Injected ( ) Good ( )
Oral ( ) Indifferent ( )
Unfavorable ( )

Catarrhal Immunization: Tablets taken on following dates:

SUMMARY OF DATA

Week	Date	Days of Cold	Severity*	Week	Date	Days of Cold	Severity*	Week	Date	Days of Cold	Severity*
1				11				21			
2				12				22			
3				13				23			
4				14				24			
5				15				25			
6				16				26			
7				17				27			
8				18				28			
9				19				29			
10				20				30			

* Relative severity should be expressed as follows. + = mild; 2+ = moderately severe; 3+ = severe; 4+ = very severe.

Fig. 2. Master card giving medical history, findings and experimental data.

two of these symptoms, a "severe cold," and all three, a "very severe cold."

RESULTS

The number of mild colds was practically the same in both groups. For the twenty-two week test period the average number per student was 0.59 for those who received placebos and 0.54 for those who received the oral vaccine. Further comparisons are confined to the three classifications of severe colds as defined above.

When data showing the week-by-week incidence of severe colds was charted (fig. 3) for the oral vaccine and the control groups, our impression was confirmed that a portion of the test period was in reality a "period of protection" against severe colds for the oral vaccine group.

For the first ten weeks (November 21, 1938, to January 29, 1939) the two curves follow each other rather closely in their fluctuations, indicating that no great protection had yet been conferred by the vaccine.

During the following eight weeks (January 30, 1939, to March 26, 1939) a severe epidemic of colds occurred which is evidenced by the control curve. Yet the students who had taken the oral vaccine remained practi-

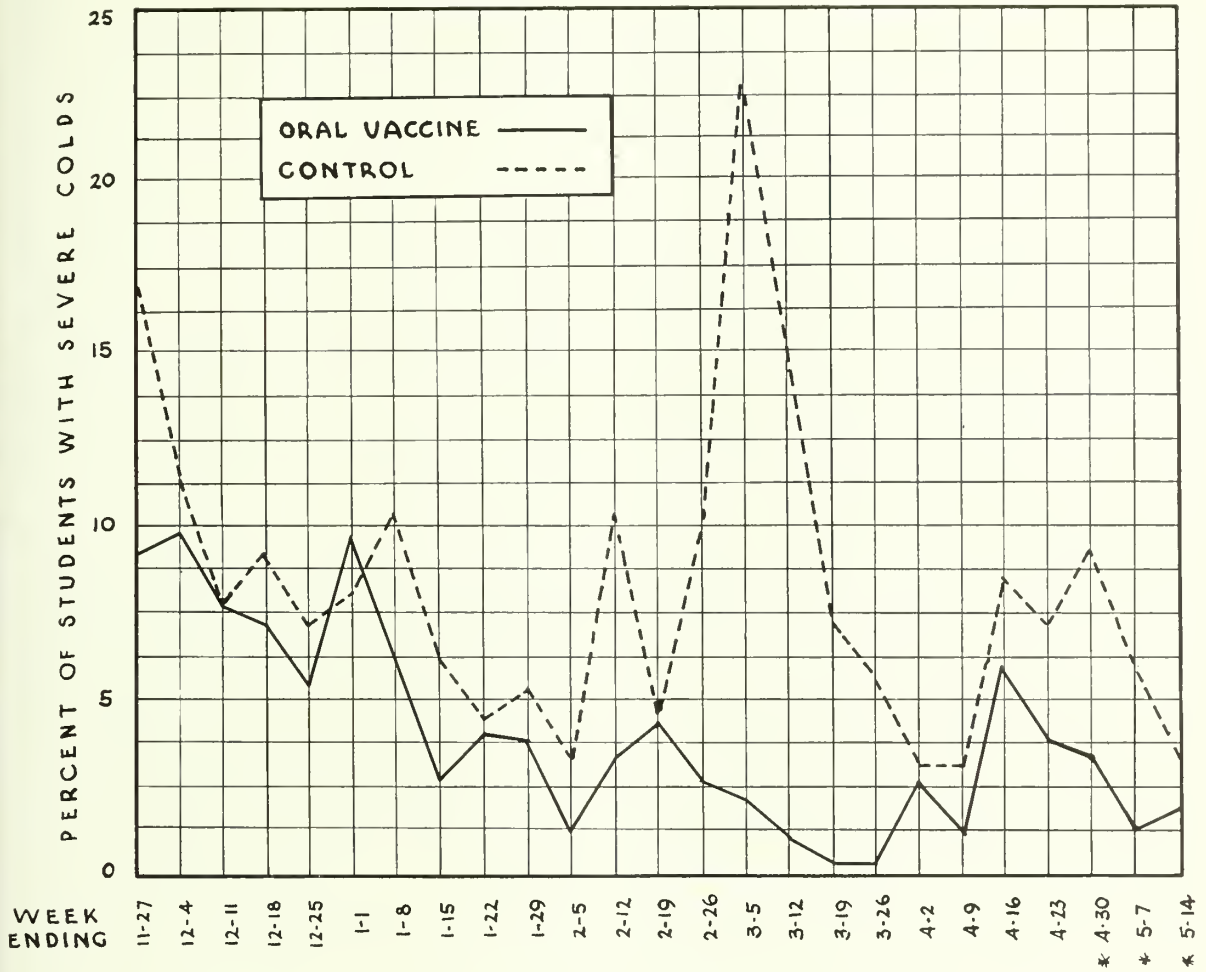

Fig. 3. Weekly incidence of severe colds.
*Data incomplete for these weeks.

cally unaffected. For only one week during the eight-week period was the cold incidence of the oral vaccine group more than one-third that of the control group. During no single week did more than 4.3 per cent of the oral vaccine group have a severe cold.

For the remaining four weeks (March 27, 1939, to April 23, 1939) of the test period, and for three additional weeks (April 24, 1939, to May 14, 1939) for which the data were incomplete, the cold incidence continued to be less in the oral vaccine group, but the difference between the two groups in this respect was no longer very great. It appears that about this time the protection afforded by the oral vaccine was rapidly decreasing.

Comparison of the control and experimental groups during the eight-week period of protection is shown in table 3.

It is evident that students who took the oral vaccine had, on the average, less than one-fifth as many severe colds as the controls. About the same degree of benefit was obtained with respect to average total days illness from severe colds. Eighty-nine per cent of the students who took oral vaccine had no severe colds at all during this period as compared with only 48 per cent of the controls.

TABLE III.
Effect of Oral Vaccine During Period of Protection

	Experimental Group (Oral Vaccine)	Control Group (Placebos)
Number of Students	185	153
Average Number of Severe Colds per Student	0.11	0.58
Average Total Days Illness from Severe Colds per Student	0.6	3.4
Students with No Severe Colds	164 (89%)	73 (48%)

DISCUSSION

The curves of the week-by-week incidence of severe colds presented (fig. 3) have been interpreted to indicate that a gradual development of protection against "severe colds" occurred over a twelve-week period following first administration of vaccine. Except for one week of the period the incidence of severe colds was less among the group receiving oral vaccine than among the controls. Each individual probably reacts somewhat dif-

ferently to the vaccine; some may absorb the bacterial antigens more efficiently, and once they are absorbed, may develop antibodies more rapidly than other individuals. It is suggested that the somewhat better record of the vaccine group during the first part of the test period, appearing as a gradual increase in protection, was caused by the early benefit obtained from the vaccine by a minority of particularly reactive students.

The same explanation applies to the apparently considerable difference in incidence between the two groups during the first week of the test period (November 21 to 27). The epidemic which occurred during that week was felt strongly by both groups, if somewhat less by the students who were taking vaccine. The difference between the two groups was actually less significant during this week than during the week ending January 15.

An alternative but less satisfactory explanation is that the antibodies produced by the vaccine were relatively ineffective against the bacteria to which the students were exposed during the first ten weeks of the test period. This factor may have some influence during the entire period of study. Such a consideration may also explain to a certain extent conflicting results which have been reported by other investigators.

The "period of protection" for the vaccine group of students may have begun as early as January 9, but not become evident because for the next few weeks no great exposure to colds occurred. The control students also were relatively free from severe colds during these weeks. The beginning of the "period of protection" was taken to be the week ending February 5, because this was the first time during the test period that the incidence of severe colds in the vaccine group was as little as one-third that among the controls. The "period of protection" was assumed to end March 26 because, while the cold incidence continued to be somewhat lower in the vaccine group for the balance of the test period, only for one week was it less than one-third that of the controls. The continued but lessened protection evidenced in the vaccine group was probably again caused by individual differences in response to the vaccine. It may be expected that the duration of protection may be greater in some individuals than in others. The variation in the length of time which had elapsed since first administration of the oral vaccine must also have had its influence on the results.

It is evident from this study that the administration of an oral vaccine was effective in producing a period of protection against severe colds in a group of cold-susceptible individuals. It is evident also that approximately three months elapsed after taking the tablets until the time when a marked difference between the experimental and the control groups became very apparent and a period of protection could be confidently recognized. Following the epidemic period the protection afforded decreased until there was again a much less significant difference between the two groups. It seems then, in order to secure maximum protection with this oral vaccine against severe colds, that administration should be begun in midsummer, and continued through the year until spring. There can be no doubt that this oral vaccine afforded marked protection against an epidemic of severe colds, reducing not only the number of colds experienced, but also the days illness suffered by those affected. The vaccine seemed to be most effective in protecting against severe colds; the incidence of mild colds was not affected.

This oral vaccine should find wide clinical application in the protection of cold-susceptible individuals from severe colds. Such a vaccine will no doubt have particular application to industrial concerns, colleges, institutions, and other centers where large numbers of individuals in close proximity make possible the easy spread of infection.

SUMMARY AND CONCLUSIONS

A carefully controlled study of the effect of an oral vaccine on the incidence, duration and severity of the common cold in a group of 338 university students is reported. It was found that a period of protection occurred during which the number of severe colds and total days illness from severe colds in the vaccine group was only one-fifth that of the controls. During an epidemic of severe colds the students in the oral vaccine groups were almost completely protected. The protection against severe colds did not become evident immediately, and remained effective for a limited period.

Our findings are such that we feel justified in recommending the further use of this oral vaccine by physicians for the prophylactic treatment of cold-susceptible individuals. To extend the period of protection we think it advisable that the administration of the oral vaccine be continuous from midsummer to spring.

Additional studies with oral vaccines are desirable.

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The Cooperation of the Health Service and the Physical Education Department*

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IT is quite unnecessary to point out that college health services and college physical education departments, though operating in very closely related fields, often have quite different major objectives, and are often manned by personnel with totally different training and totally different points of view. And though we accept that fact amongst ourselves without question, to some college administrators and most college professors, the distinction between the two departments is too hazy to be of practical use. As a consequence we not infrequently see a college administration looking confidently to its health service and physical education department to do certain jobs that need being done while neither department would admit its specific responsibility for that job and no administrative device is set up to assign these border-line responsibilities.

In any such situation where the two coördinate departments are in doubt as to their separate responsibilities, a conference between the two department heads and a definite division of and allocation of the responsibilities, would seem essential. At such a conference the president of the college might well be present since the allocation of duties becomes to a considerable extent a matter of policy.

Perhaps the first question that will arise at this conference, is the question as to who will do the health teaching. The advantages in having the physical education staff do the health teaching should be balanced against the advantages of having the student health service physicians do it, and when the decision is made adequate support from the college should go to the department shouldered with this important responsibility. In my experience, I would be inclined to shoulder this responsibility upon the health service for two reasons. First, no one with less training than a physician can begin to answer adequately the health questions of the modern college student; second, no one is as thoroughly and continuously made aware of the needs of college students for health information, as is the student health service physician in his daily contact with sick students in his office. By training and position, the college physician is ideally situated for doing the health teaching, but if he lacks that spark of enthusiasm which is essential for the proper transmission of knowledge and interest for teacher to student, he must be willing to see others who "have what it takes" carry on where he faltered.

The second question will likely involve the exchange of important services between the two departments. The health service, having found upon examination a group of students with pronated feet, or kypholordosis, or flabby muscles, will want to prescribe special corrective exercises for these students and will need the services of one or more specially trained physical educators in order to have these corrective exercises properly given. The physical education department, on the other hand, will need the services of one or more of the student-health-service physicians in supervising the sanitation of pools, lockerrooms, towelrooms and showers; in diagnosing, prognosing, treating and rehabilitating the ill and injured athletes; in supervising the prevention of athletic injuries. A definite allotment of certain staff members' time for these specific duties should be made and the general principle laid down that when the physician is working for the physical education department he is under the authority of the head of the physical education department. By the same token, when the corrective physical education instructor is working for the health service, he is under the authority of the head of the health service.

A schedule which we use at Cornell for prescribing sets of exercises by number, follows:

Schedule 1 is for the general development of the size, tone and strength of muscles, and is, therefore, combined with as many of the other schedules as possible. Schedule 7 is particularly for those under observation for tuberculosis but not showing definite lesions. Schedule 8 is for convalescing knee cases.

Schedule 1—Light calisthenics, medicine ball, chest weights, hand ball (supervised), swimming (non-competitive).
Schedule 2—Pronated foot exercises.
Schedule 3—Scoliosis exercises.
Schedule 4—Lordosis exercises.
Schedule 5—Kyphosis exercises.
Schedule 6—Abdominal muscle training.
Schedule 7—Light calisthenics, chest weights, walking.
Schedule 8—Swimming, rowing, chest weights.

The third question will concern the complete staffs of both departments, and call for the coöperation of each member. With each student that the health-service physician examines in health or illness, the question of participation in the physical activity program should be raised and the varying powers and needs of the student considered in proscribing, prescribing or modifying his physical activities. In the same way each physical-education instructor should be continuously on the lookout for students who would benefit by medical diagnosis, treatment or advice. Under the eyes of the physical-education instructor, tests of functional efficiency are being made daily and any evidence of undue fatigue, undue tension or severe dysfunction, should result in prompt reference of the student to the student-health service.

In order to guarantee that the health of the participants in competitive athletics is properly protected, it

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is essential that as a fourth problem a code of health regulations be drawn up and agreed to by the administrative heads of the athletic division and the health service. Such regulations should be printed in pamphlet form and given to each student who enters athletic competition. A copy of "Health Regulations" adopted at Cornell University October 22, 1937, follows:

Health Regulations

Section I. No student in the University is eligible to compete in organized athletics (Varsity, Freshman or Intra-mural) until he is certified by the Medical Adviser, Team Physician, or one of the Assistant Medical Advisers, to be physically qualified so to compete. Each captain or manager shall file a complete list with the Director of the Department of Physical Education and Athletics immediately after the first call for candidates, and an "athletic number" must be procured by each such candidate before he participates in serious practice or competition.

Section II. A physician, to be known as the Team Physician, shall be provided to care for all injuries received by any member of the University engaged in organized Varsity or Freshman athletics. He shall report such cases to the Medical Adviser, and if he considers an injury sufficiently severe to prevent participation in athletics, he shall so state. He shall be present at such athletic games and practice as may be deemed necessary by the Medical Adviser. He shall procure such surgical or other specialized consultation service as he deems necessary to the proper care of the injured student.

First Aid care and limited medical and surgical treatment are to be available from 9:00 A. M. to 1:00 P. M. daily except Sunday, and from 2:00 P. M. to 6:00 P. M. daily except Saturday and Sunday at the Medical Adviser's Office for all participants in Intra-mural athletics. Medical services beyond those available at the Medical Adviser's Office, are to be at the student's own expense.

Section III. Each captain or coach, or his representative, shall notify the Medical Adviser or the Team Physician when any student engaged in organized athletics under him is suffering from any injury or illness.

Section IV. In case the Medical Adviser or Team Physician determines that any student is physically unfit to compete in any branch of athletics, either by reason of injury or illness, the student so disqualified may not compete until such disqualification is removed by the Medical Adviser or Team Physician.

Section V. Nothing in the foregoing shall be construed as preventing students or their parents from procuring advice or service from physicians or surgeons of their own choice. In such cases, however, the expense will not be a charge against the Cornell University Department of Physical Education and Athletics.

No bills for medical services or supplies of any kind whatever will be paid by the Cornell University Department of Physical Education and Athletics unless authorized in advance by the Director of Athletics, the Medical Adviser or the Team Physician.

Section VI. Treatment by trainers, rubbers and other attendants shall be under the supervision of the physician in charge. Daily treatment records must be submitted to the Team Physician by those administering treatment.

Section VII. A record of all injuries to Varsity and Freshman athletes, including the type of injury, the mechanism of injury and the time lost from practice and from classes, will be kept by the Team Physician and a summary of this record will be submitted annually to the Medical Adviser and the Director of the Department of Physical Education and Athletics.

A similar record of injuries to those participating in Intra-mural sports will be kept in the Medical Adviser's Office.

In a sport such as football, the number and complexity of necessary duties is so great that a definite plan of allotment of duties for that particular sport is well worth while. Such a plan for football follows. No. I briefly outlines the sequence of events while No. II briefly allots the duties between the equipment man, trainer, coach, physician, consultant, and physiotherapist. Such a plan to be practicable should be made up at a conference of these six workers and the administrative heads of the athletic division and student health service.

I. The Duties to be Performed

Prevention of injury. (a) Study of mechanism of injury—method of tackling or blocking. (b) Repeated review of type, condition and fit of equipment. (c) Conditioning of players, grass drills, etc. (d) Preventive strapping and bandaging.

Detection of injury. (a) Joint observation and coöperation by trainer, coach and physician during games and practice. (b) After game inspection.

Diagnosis and treatment of injury. Consultants (surgery, orthopedics, eye, ear, nose and throat), physician, physiotherapist (trainer and assistant).

Prognosis. (a) Physician reports all disabling injuries to coach and makes prognosis.

Rehabilitation. (a) Physician authorizes gradual return to activity. (b) Trainer supervises gradual return. (c) Coach accepts physical limitations of player temporarily.

II. The Allotment of Duties

Equipment man. 1. Issue and fitting of equipment. 2. Inspection of equipment. 3. Repair of equipment.

Trainer. 1. Preventive strapping and bandaging. 2. Grass drills. 3. After game inspection. 4. Giving prescribed treatments. 5. Supervision of graduated return to full activity.

Coach. 1. Study of mechanism of injury. 2. Knowledge of condition of every injured player. 3. Detection of signs of injury. 4. Design and choice of equipment.

Physician. 1. General diagnosis. 2. Supervision of general treatment. 3. Prognosis and report. 4. Analysis of causes of injury. 5. Recommendations for prevention of injury. 6. Prescription and fitting of special equipment.

Consultant. 1. Special diagnosis. 2. Special prescription or treatment.

Physiotherapist. 1. Carry out prescribed treatment: Heat therapy, light therapy, electrotherapy, hydrotherapy, massage therapy.

To work out a detailed plan of practical coöperation between the physical-education, athletic and student-health-service staff, is a laborious process and many changes in the plan will be made as it is placed in operation. Experience has shown, however, that in no other way can we avoid omissions of essential services and overlapping of responsibilities with consequent friction, and in no other way can we obtain the ideal situation in which coach, doctor, trainer and others exchange services and information freely and the whole group works together as an efficient unit.

White Flies in Europe*

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In the city of Rome, tourism is an important business. The guides gather up the tourists from the various hotels and convey them to a central point where they are grouped according to language. Owing to political conditions, Americans were scarce at the time of our visit—so scarce in fact that guides called them "white flies" in reporting to their chief at the common rendezvous.

We were in Italy two weeks. The city of Naples, where we first landed, has long been noted for its dirt, its beggars and its poverty. A ships officer, who had visited the port before the days of Mussolini, told me that it was all that had ever been said about it. The description no longer applied. The city was clean, the people were busy and well dressed, new buildings completed or under construction, were all about. No beggars or idle groups were to be seen. What was true of Naples was even more true of Rome. Fine new buildings were going up, old slums were being torn down. Both Naples and Rome have silent traffic, no horns or sirens. While cars were not so numerous, when one considers the narrow streets, the traffic problem in Rome and Naples was perhaps no less difficult than in Minneapolis.

Hotel service in Italy was good, food was excellent and rates were reasonable, especially as compared with England. Hotel rates were not quite as cheap as the quoted price suggested, for various items showed up on the bill that were not stressed when accommodations were engaged.

I was handed a slip of paper at the hotel desk which stated, among other things, that hotel employees are not allowed to accept gratuities. Anyone found guilty of violating this rule would be instantly discharged. Fifteen per cent is added to your bill in lieu of tips. However, I was struck by the magnificence of the bow given by the elevator boy and the sweetness of the smile of the maid as she came to turn down the covers on our beds. When the time came to leave, she was at the door to bid us farewell and the look of grief and sadness on her face would soften a stonier heart than mine. I wondered if this girl had the courage to defy Mussolini. I thought to try her. I offered a tip. She took it. The parting bow of the elevator boy was beyond my power to describe. He too had courage. In fact, the whole staff gave evidence that the spirit of independence still lived in the Italian breast.

I had long hoped some day to see something of Italian art. Michelangelo, Raphael, Titian, Botticello and Leonardo de Vinci. What a galaxy! But the world moves. A new art has made its appearance in Italy. It is difficult for me to describe it as my level of artistic appreciation is very low. I do know, however, how many square feet a gallon of paint will cover and I made an effort to measure modern Italian art by this crude method. I had no other. The results were somewhat as follows: 1,750,000 gallons of black paint for Il Duce, 500,000 gallons for Heil Hitler, 850,000 for Romano Berlino Assi. (No, you are wrong, the word means axis.) There were 700,000 gallons for words meaning believe, obey, fight; 500,000 gallons for slogans too various to classify.

Mussolini believes in advertising and no building within eye-shot of the railroad or highway was without its artistic embellishment in the modern manner. However, there was some taste in the arrangement and there was an entire absence of hideous road signs you see here.

In Germany, everybody was in a holiday mood. They were celebrating the 50th birthday of "Der Fuehrer." Mountain resorts were crowded with people. Old Austria is a beautiful land. The train was crowded with homecoming German tourists and we were fortunate in obtaining the only first class compartment on the train. The conductor looked after us with the solicitude of a father watching over a simple-minded child. We never saw a customs officer going in or out, but we were asked about money. Germany is on a controlled exchange basis and while the officials were courteous it would be a serious matter to be detected smuggling German money either in or out. We had a portable radio with us and found that restrictions governing their use were the same as here. You tune in when, where, and what you please. One loses interest in radio in Europe. Programs seem dull compared with ours and the news is, obviously, especially prepared for the other fellow to hear.

In Vienna I visited the Unfallkrankenhaus and sent in my card to Professor Lorenz Bohler. I was the first American to visit his clinic for six months. There were few Americans taking eye and medical courses at the Algemeinekrankenhaus but I became so interested and was treated so well at the Unfallkrankenhaus that I spent every morning there for two weeks. Afternoons we went sight-seeing about the city and adjacent country.

The Unfallkrankenhaus is supported by the Workman's insurance companies and receives industrial accident cases. About 50 new patients are admitted daily, the great majority being treated as outpatients. Dr. Bohler said that 98 per cent of the wounds heal by first intention. Practically all wounds undergo a complete debridement. Small lacerations of the hands are excised to their depth, sutured with silk and a fixed dressing applied. Bohler's is a plaster clinic. It is a worthwhile sight to see the chief *diener* roll plaster bandages. He rolls with his left hand while the right spreads the plaster. I saw eight cases with bilateral os calcis fracture. They were treated by mobilization of the fragments, traction with a pin through the os calcis and reduction of the spread with a clamp. No plaster casts were applied until after the third week. They were kept under traction on Braun splints. I asked Dr. Bohler how he accounted for the many os calcis fractures. He thought perhaps it was due to awkwardness. Some had

*Presented before the meeting of the medical staff of the Lymanhurst Health Center, Minneapolis, September 26, 1939.

had no work for years and with the return of employment especially in the building trades, falls were abnormally frequent. Fresh wounds with skin defects were covered immediately by pinch grafts, plaster casts applied, the surface left open but protected by a wire mesh secured to the plaster. Infected surfaces were covered with pinch grafts and a thick layer of gauze. They were moistened three times a day with a camomile tea. Dressings were not changed for twelve days.

Dr. Bohler's staff, most of whom spoke good English, were more than kind. One gets a gown and is left to go about freely and stand close to the tables. Ward rounds with Dr. Bohler were a novel experience. Rounds began at 11 A. M. Dr. Bohler, his staff, ward nurse and visiting physicians trooped into the large wards. Patients who could do so stood by their beds fully undressed. When in the ward, all came to a full stop, up went the right arms in the Nazi salute and out came a ringing "Heil Hitler." The salute was repeated as we went out. It was very dramatic.

I visited the fracture section of Professor Magnus in Munich. His clinic is almost as large as Dr. Bohler's. It is interesting because of the contrast with Dr. Bohler's. He avoids plaster whenever possible, uses all sorts of traction schemes and stresses the importance of never using circular plaster. He puts a U-shaped plaster on a leg and then a starch bandage in a circular manner. I confess I couldn't see the difference. He had a unique method of bone grafting. I saw him operate for pseudo-arthrosis of the radius. He bared the upper surface of the fragments with a chisel, took a graft cut to fit from the tibia, passed four wires around the fragments and graft, brought the wire ends through slate-pencil sized steel tubes about one inch long, wound this up tightly with a key arrangement, bent them over the edge of the tube, covered all with gauze and a plaster and starch bandage. After three weeks the wire is cut on one side and withdrawn. He reported a series of over 70 cases with excellent results.

In London I met again with a most friendly and hospitable reception. The courtesy and helpfulness of the London Bobby make a stranger's stay in London a very pleasant memory.

The medical men were more than kind. Interesting clinics, dinners at West End clubs, long auto rides through the city, and visits to 200-year-old homes on Harley Street will live with me in memory for the rest of my life. If there is coldness and formality in the English manner it certainly was not noted among the fine surgeons and physicians I met in London.

What a thrill to visit Guys Hospital and the clinic of Dr. Hearst; to hear and see him present cases of Addison's disease while sitting in the very room where Addison taught. How wonderful to have his original notes illustrated in water colors and his original specimens wonderfully preserved, in our hands, while listening to the lecture!

Mr. Reginald Ledlie was a joy to watch as a surgeon. It was not until he wrote an address for me that I knew whether he was right or left handed. The ease and rapidity with which he did his work without any sign of haste reminded me of Dr. Judd. He was also a source of much useful information. I learned much of English medical custom that I would like to see in my own land. A staff appointment in a London hospital comes to a man on an average only after fifteen years of work and study. Appointments are secured by competitive examination of the most rigid character. Surgeons must be members of the Royal College. Membership in this is gained by examination. All London hospitals are supported by charity and the attending staff receive no compensation. Private patients are cared for in so-called nursing homes. Surgeons receive pay for about 10 per cent of their work, but an appointment as a staff surgeon carries with it a certain amount of private practice.

The unit costs are high. Mr. Ledlie told me that the unit cost of the Royal Cancer Hospital was 11 guineas ($50.00) per week without research. He said there seemed to be no trouble in getting funds for its support. I had previously noted in a London paper that a Harry Oakes of Toronto, Canada, had been knighted, and also that he had given 90,000 pounds to Georges Hospital. (I think I shall have to ask our South Dakota legislature to institute some order of nobility in our state. It certainly has its good points.) Mr. Ledlie agreed with my comments that the name of Royal Cancer was "rotten" but said they feared a change might lessen its support. Radium is used in heroic doses. I saw many mouth cases with histories going back over five years. It is applied in bombs and several patients had all the soft parts sloughed away exposing the bone on outer aspects of the lower jaw through almost half its external surface. Cases have water color drawings as part of their record, thus giving a very accurate and vivid picture of the original pathology. Mr. Ledlie told me that they had not been much impressed with the value of cell type differentiation.

At the Brompton hospital for consumption I attended a clinic of Dr. Marshall who presented a group of early cases. Methods are about the same as here. He does not separate first infection groups from reinfection types. He stated that tuberculosis was diminishing in all classes in England except in young women. This he thought was due to their entering "what you Americans call gainful employment" during the war. They have displaced men in many callings formerly closed to them such as train conductors, lift operators, etc. Wages are so low, 16 to 20 shillings a week (about $4.00 to $4.75), that considering the high cost of living in England (about 30 per cent above Germany, and higher than any of our American cities) standards of living are such as to favor the spread and severity of tubercular infection.

At Georges Hospital I saw a Mr. Burns do an exclusion operation preliminary to a removal of a carcinoma of the ascending colon. His table was draped with green sheets and towels. When the time for opening into the bowel came, a large red spread was put over all and then when the ends of the excluded segments distal and proximal bowel were closed and the mucosa at the site of the lateral anastomosis sutured, the red sheet was removed, gloves changed, and the operation finished with a sterile field.

Experimental Studies of Some Comparative Nutritional Values of Homogenized and Strained Vegetables

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THE process of homogenization, which was first developed for milk and later applied to strained vegetables, results in a much finer division of the cells and fibres of the vegetable than is obtained by the straining process alone. It seemed possible that minerals might be more readily available in the form of homogenized vegetables than in the form of strained vegetables. There appeared to be some indication of this in the report of Caldwell[1] and further experiments were undertaken to compare the availability of the iron in strained vegetables with that in homogenized vegetables. This report presents results of experiments on rats and of clinical studies on infants during periods of supplemental feedings of vegetables in the two forms.

Experiments on Rats

The rat experiments were planned to determine the comparative availabilities of iron fed in the form of canned strained spinach, homogenized spinach and a homogenized mixture of equal parts of peas, carrots and spinach. Both the strained and the homogenized spinach were prepared from the same lot of fresh spinach. The utilization of the iron was determined by noting the increases in both hemoglobin and erythrocytes of bloods of young anemic rats fed equivalent amounts of iron in the three forms of vegetables.

Rats were prepared for these tests according to the method described by Elvehjem and Kemmerer.[2] At 21 days of age the animals were weaned and placed on an exclusive diet of whole milk powder and water. The animals were considered ready for test when the hemoglobin concentration in the blood had been reduced to an anemic level of 5 or less gm. per 100 cc. as determined by the Newcomer method.

Although the addition of copper to the anemia producing diet has been recommended by several workers, Schultze and Elvehjem,[3] Smith and Otis[4], previous experience in this laboratory corroborated the conclusion of Rose and Hubbell[5] that the addition of copper produced variable responses. Therefore no additional supplements of copper were added at any time during these studies since the purpose in these experiments was to compare only the hematopoietic responses to vegetable supplements containing equivalent amounts of iron and approximately the same amounts of copper.

When the concentration of hemoglobin in the bloods of the rats had reached the desired level, the rats were divided into groups, care being exercised that the distribution of litter mates in each group was made as uniformly as possible with respect also to sex, age, weight and hemoglobin level.

TABLE I.
Hemoglobin Responses of Rats to Daily Supplements of Either Strained Spinach, Homogenized Spinach or a Mixture of Homogenized Vegetables
Period of Observation—5 Weeks

Daily Supplement	Amount of Daily Supplement (gm.)	Daily Iron Intake (mg.)	Number of Rats	Hemoglobin — (gm. per 100 cc.)		
				Initial	Final	Increase
Strained Spinach	6.2	0.15	10	4.8	6.3	+1.5
Homogenized Spinach	6.8	0.15	10	4.6	7.8	+3.2
Homogenized Vegetables	6.0	0.15	10	4.7	7.3	+2.6
Strained Spinach	12.4	0.30	10	4.6	9.1[1]	+4.5
Homogenized Spinach	13.6	0.30	9	4.7	10.2	+5.5
Homogenized Vegetables	12.0	0.30	4	4.2	11.3	+7.1

[1]Two rats died during the feeding period.

In the first series of experiments, the three forms of vegetables were fed in amounts sufficient to furnish only 0.15 mg. of iron daily. A second series of experiments was conducted later, in which the amount of the feeding supplied 0.30 mg. of iron daily. All groups were continued on the vegetable supplements for a period of five weeks.

The hemoglobin responses in bloods of rats receiving daily vegetable supplements at the two levels of iron intake are presented in table I. It will be noted that although the initial average hemoglobin values were approximately the same in the first three groups of rats, the two groups receiving the homogenized vegetables showed greater increases at the end of the five-week period of feeding than did the group receiving the strained vegetables. This was also the finding in the three groups which received 0.3 mg. of iron and in which increases in hemoglobin were greater than those observed in the groups which received only 0.15 mg. of iron daily. In the second series, however, the maximum increase was obtained by the feeding of the homogenized mixture of vegetables whereas, in the first series, the homogenized spinach produced a slightly greater increase than did

TABLE II.

Erythrocyte Responses of Rats to Daily Supplements of Either Strained Spinach or a Mixture of Homogenized Vegetables

Period of Observation—5 Weeks

Daily Supplement	Amount of Daily Supplement (gm.)	Daily Iron Intake (Mg.)	Number of Rats	R. B. C. — (millions per c. mm.)		
				Initial	Final	Increase
Strained Spinach	6.2	0.15	10	3.01	3.72	+0.71
Homogenized Spinach	6.8	0.15	10	2.78	4.61	+1.83
Homogenized Vegetables	6.0	0.15	10	2.47	4.42	+1.95
Strained Spinach	12.4	0.30	10	2.77	5.19[1]	+2.42
Homogenized Spinach	13.6	0.30	9	2.54	6.08	+3.54
Homogenized Vegetables	12.0	0.30	4	2.55	6.29	+3.74

[1]Two rats died during the feeding period

TABLE III.

Hemoglobin Responses of Infants to Supplements of Either Strained or Homogenized Vegetables

Period of Observation—2 Months

Age at Start (months)	Vegetable Supplements	Number of Infants	Hemoglobin — (per cent of Standard)		
			Initial	Final	Change
2	Homogenized	11	68.1	70.9	+2.8
	Strained	9	65.5	68.0	+2.5
	Homogenized	94	77.0	78.5	+1.5
	Strained	54	76.8	77.0	+0.2
	Homogenized	41	84.5	86.1	+1.6
	Strained	52	86.2	81.4	—4.8
3	Homogenized	13	76.3	80.8	+4.5
	Strained	17	77.5	76.7	—0.8
4—7	Homogenized	21	81.5	84.8	+3.3
	Strained	13	84.9	84.3	—0.6

the homogenized mixture of vegetables. The small number of animals in the group receiving 0.30 mg. of iron as the homogenized mixture of vegetables may account for the lack of agreement between responses in hemoglobin formation to the two homogenized supplements in the two series of experiments.

The erythrocyte responses to the three supplements, however, were in closer agreement in the two series as shown in table II. The increases in the number of red blood corpuscles were approximately equal for the two homogenized supplements and were from 1.5 to 2.5 times as great as was the increase obtained with the supplement of strained spinach.

If the responses in hemoglobin and erythrocytes to the three different supplements be compared at weekly intervals as has been done in charts I and II, the differences between the homogenized and the strained vegetables are more pronounced than were the final differences which were presented in the tables. There was a slow response, in both hemoglobin and erythrocyte formation, to the supplements of the strained spinach when fed at either level. Particularly at the higher level of feeding, the difference was marked at the end of the third week, after which the responses to the strained spinach were increased so that the final difference was not so great as those seen during the first three weeks.

Clinical Studies on Infants

A clinical study on young infants was undertaken to determine the practical value of feeding daily supplements of an homogenized mixture of vegetables in the prevention or correction of nutritional anemia in young infants.

Elvehjem and associates[6] have reported a continuous destruction in hemoglobin during the early weeks of life to a minimum value between 8 and 12 weeks. Stearns and McKinley,[7] in a study of hemoglobin destruction and iron conservation in infants, found that blood iron reached its minimal value between 4 and 6 weeks of age. These reports indicated the need of incorporation of vegetables or other sources of iron in the diet of infants at as early an age as possible.

All cases observed were well infants, confined within an institution and maintained on a uniform milk formula diet. At different age periods, the infants were divided into two groups. One group followed the usual routine of feeding in the institution, i. e., their diets were reinforced with vegetables cooked and strained in the diet kitchen of the institution. The other group received equivalent amounts of canned homogenized vegetables. In all other respects, the diets of both groups were similar.

Both strained and homogenized vegetable supplements were made up of mixtures of peas, carrots and spinach in equivalent proportions. Analyses of 18 representative samples of the strained vegetable mixture prepared for infant feeding have given an average figure for iron of 2.30 mg., and an average value for copper of 0.20 mg. per 100 gm. The homogenized mixture of vegetables used in these studies had average iron and copper contents of 2.50 mg. and 0.15 mg. respectively.

Samples of bloods from all infants were taken before the supplementary vegetable feedings and at intervals

CHART I.

Average Weekly Increases in Hemoglobins of Anemic Rats Receiving Daily Supplements of Either Strained Spinach, Homogenized Spinach or a Mixture of Homogenized Vegetables.

——— Strained Spinach
- - - - - Homogenized Spinach
——— - - Homogenized Vegetable Mixture

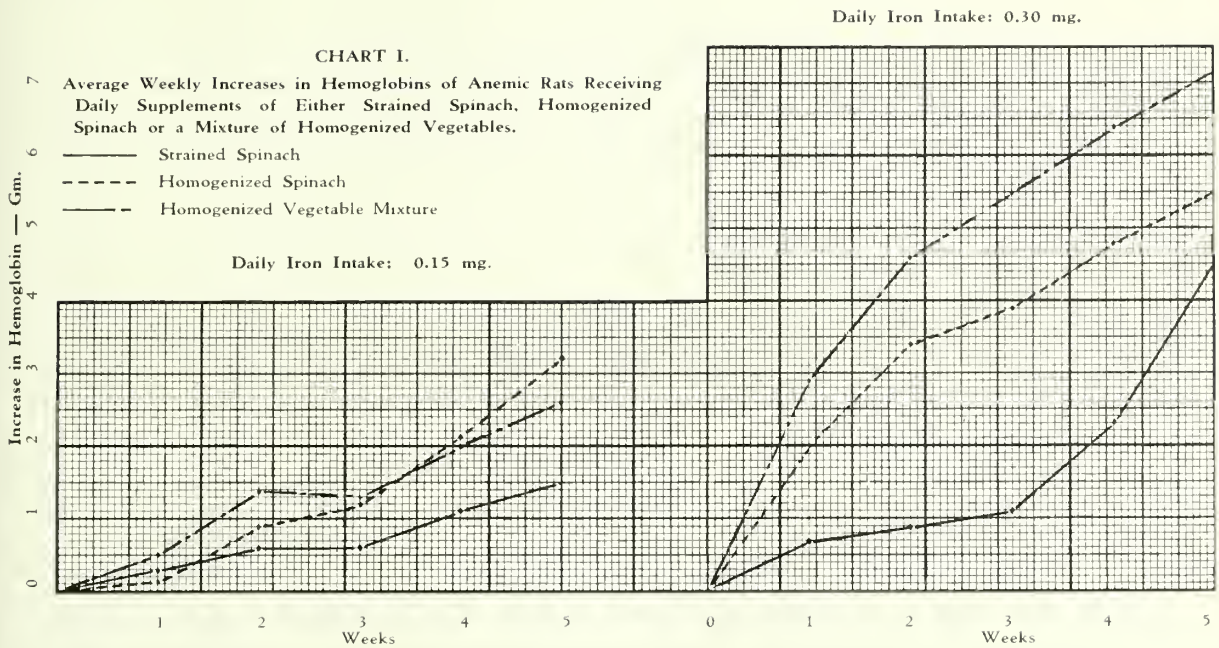
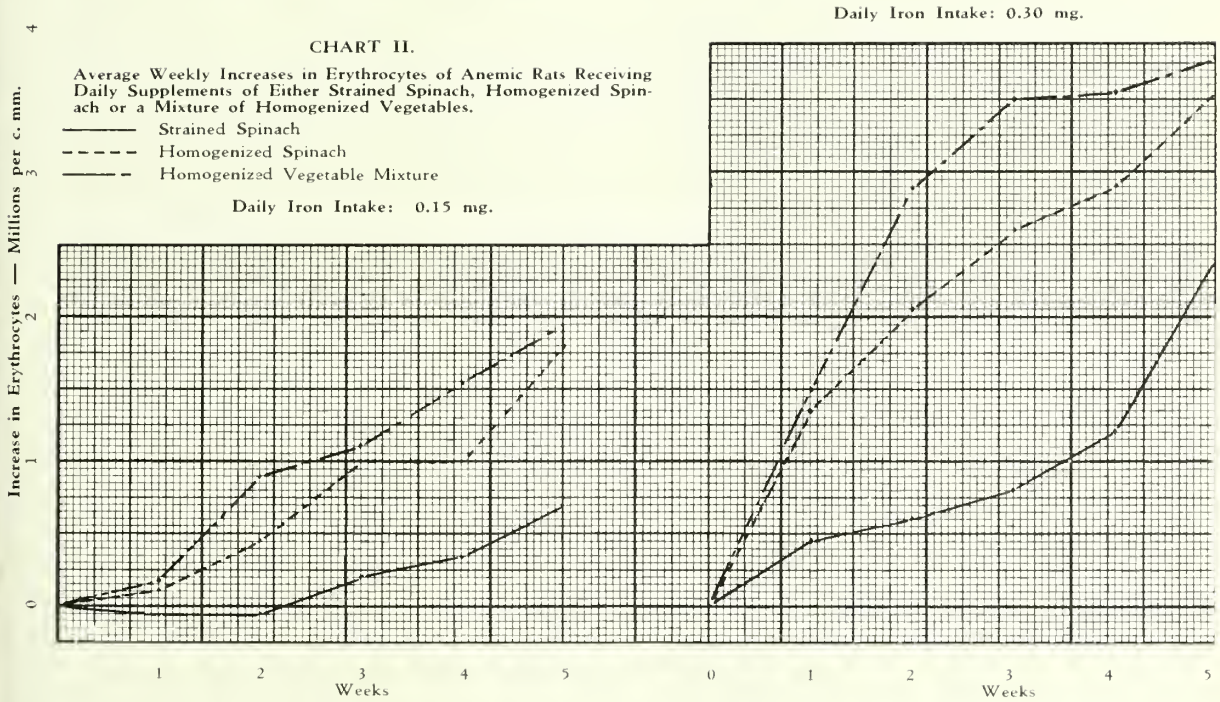


CHART II.

Average Weekly Increases in Erythrocytes of Anemic Rats Receiving Daily Supplements of Either Strained Spinach, Homogenized Spinach or a Mixture of Homogenized Vegetables.

——— Strained Spinach
- - - - - Homogenized Spinach
——— - - Homogenized Vegetable Mixture



during the period of vegetable feedings. Counts were made of the red blood cells and hemoglobin was determined by means of the Sahli hemoglobinometer.

Only infants having initial hemoglobin values of not more than 90 per cent of the standard of 14.5 gm. per 100 cc. of blood have been included in this study. Also all cases have been omitted which, during the feeding period, developed any abnormal state or required any medication which might influence the level of either hemoglobin or red blood cells of the infants' bloods.

All of the infants have been divided into three age groups on the basis of the time during the first year of life when the feeding of the vegetable supplements was begun.

Of the 261 infants which were in the 2 months group, 146 received homogenized vegetables and 115 followed the institution routine with strained vegetables. Both of the 2 months groups have been subdivided into three subgroups representing three different levels of initial

TABLE IV.

Erythrocyte Responses of Infants to Supplements of Either Strained or Homogenized Vegetables

Period of Observation—2 Months

Age at Start (months)	Vegetable Supplements	Number of Infants	R. B. C. — (millions per c. mm.)		
			Initial	Final	Change
2	Homogenized	11	3.78	4.07	+0.29
	Strained	9	3.73	3.79	+0.06
	Homogenized	94	3.96	4.08	+0.12
	Strained	54	3.98	3.82	−0.16
	Homogenized	41	4.13	4.15	+0.02
	Strained	52	4.16	3.95	−0.21
3	Homogenized	13	4.11	4.18	+0.07
	Strained	17	4.07	3.68	−0.39
4—7	Homogenized	21	4.07	4.16	+0.09
	Strained	13	4.08	4.10	+0.02

hemoglobins, 60-70, 70-80 and 80-90 per cent respectively.

Data on the hemoglobin changes noted in all the groups are presented in table III.

For the first subgroup, representing the lowest initial levels of hemoglobin, approximately equivalent increases were found for the groups fed homogenized vegetables and those receiving strained vegetables.

In both the other two subgroups, however, infants fed homogenized vegetables showed small average increases in hemoglobin whereas the infants receiving strained vegetables exhibited practically no change in one group and in the other an average decrease of 4.8 per cent of hemoglobin was noted.

Since the primary interest in these studies was the retardation of the steadily falling hemoglobin at this period of life, another criterion has been considered in appraising the practical values of these two forms of vegetable supplements, i. e., the relative numbers of infants in both groups showing either continued increases or decreases in hemoglobin during the test period. Of the 146 infants in the 2 months group fed the homogenized vegetables, 63 per cent showed increases in hemoglobin and 23 per cent decreases but only 10 per cent exhibited decreases of 4 per cent or more. Among the 115 infants fed strained vegetables under like conditions, only 28 per cent gave increases but 49 per cent decreases in hemoglobin; 29 per cent showed decreases of 4 per cent or more.

In the older age groups, namely 3 months and 4 to 7 months, the differences between the homogenized and the strained vegetables were even more pronounced. Not only did the homogenized vegetables, in each group, prevent the decreases which might normally be expected during this period but permitted a notable increase in the hemoglobin levels. In the groups receiving the strained vegetables the hemoglobin decreased slightly during the feeding period.

Data for changes in red cell counts of the infants' bloods of all age groups are presented in table IV. All groups of infants on the homogenized vegetables showed average increases in erythrocytes varying from 20,000 to 290,000 per c. mm. Three groups on strained vegetables gave average decreases varying from 160,000 to 390,000 and two exhibited average increases of 20,000 and 60,000.

Of the 146 infants in the 2 months group fed homogenized vegetables, 60 per cent showed increases in red cells, and 28 per cent had decreases; 16 per cent gave decreases of 200,000 or more. Of the 115 infants receiving supplements of strained vegetables, only 33 per cent exhibited increases in red cells but 63 per cent showed decreases; 40 per cent gave decreases of 200,000 or more.

Since these results indicated that the feeding of homogenized vegetables afforded some protection against the development of a nutritional anemia in infants between 2 and 7 months of age, similar feeding tests using only homogenized vegetables were made on infants under 2 months of age. Previous clinical studies had shown that infants as young as 4 weeks could tolerate small supplements of vegetables which had been subjected to the homogenization process.

The data obtained for hemoglobin and erythrocyte counts of bloods of the infants between the ages of 4 and 8 weeks, given supplemental feedings of homogenized vegetables, are presented in tables V and VI. The 16 infants in this series are arranged according to the age in weeks at which the homogenized vegetables were added to the diet. Hemoglobins and red cell counts were determined monthly during the two months period of supplemental feedings.

From the data of Stearns and McKinley who made repeated analyses of bloods of 17 infants between the ages of 10 and 160 days, maintained on an exclusive milk diet, it has been possible to select values obtained at ages corresponding to the ages represented in the groups receiving the homogenized vegetables. These data also are given in tables V and VI for purposes of comparison.

Stearns and McKinley's data show average decreases in the hemoglobin for the first two age groups and small average increases for the two older groups. All infants receiving supplements of homogenized vegetables, however, showed increases in their hemoglobins after two months of feeding. Average increases in the percentage of hemoglobin were found for the four groups to vary from 5.0 to 9.6 per cent.

The data of Stearns and McKinley for red blood cells, show average decreases for three age groups, two

TABLE V.
Comparative Data of Hemoglobin Content of Bloods of Babies Maintained on a Diet Either of Milk or of Milk Supplemented by Homogenized Vegetables
Period of Observation—2 Months

Age (weeks)	Number of Cases	Hemoglobin — (per cent of Standard)			
		Initial[1]	Final Group on Milk	Final — Group on Milk plus Vegetables	Increase or Decrease
4	12	85.5	76.9 (6)[2]		—8.6
4	6	79.0		85.0	+6.0
5	8	80.7	73.4 (8)		—7.3
5	5	77.4		82.4	+5.0
7	7	72.9	75.9 (5)		+3.0
7	2	74.0		83.5	+9.5
8	10	74.5	77.9 (4)		+3.4
8	3	76.0		85.6	+9.6

[1]Data for babies maintained on milk diet are taken from table on Stearns and McKinley.
[2]Numbers in parenthesis indicate number of cases examined at the end of the 2 months period.

TABLE VI.
Comparative Data of Erythrocyte Content of Bloods of Babies Maintained on a Diet Either of Milk or of Milk Supplemented by Homogenized Vegetables
Period of Observation—2 Months

Age (weeks)	Number of Cases	R. B. C. — (millions per c. mm.)			
		Initial[1]	Final[1] Group on Milk	Final — Group on Milk plus Vegetables	Increase or Decrease
4	12	3.92	3.52 (6)[2]		—0.40
4	6	4.06		4.40	+0.34
5	8	3.77	3.66 (8)		—0.11
5	5	3.92		4.32	+0.40
7	7	4.05	4.51 (5)		—0.54
7	2	4.04		4.30	+0.26
8	10	3.49	3.74 (4)		+0.25
8	3	3.93		4.26	+0.33

[1]Data for babies maintained on milk diet are taken from table of Stearns and McKinley.
[2]Numbers in parenthesis indicate number of cases examined at the end of the 2 months period.

of which are significant, i. e., the 4 weeks and the 7 weeks period. For the oldest group, 8 weeks, these authors noted an average increase of 250,000. Infants in all age groups fed supplements of homogenized vegetables, showed increases in red blood cells, the averages for the groups varying from 260,000 to 400,000.

SUMMARY

Spinach which had been homogenized after straining, when fed to milk anemic rats, produced a more rapid rate of regeneration of both hemoglobin and red blood cells than did spinach from the same stock sample which had been strained but not homogenized.

Since both samples of spinach were fed in quantities sufficient to furnish equivalent amounts of iron, results of these experiments indicate that iron in the homogenized vegetable may be utilized by milk-anemic rats more completely than iron contained in strained spinach.

A homogenized mixture of spinach, carrots and peas fed to milk anemic rats effected hematopoietic responses approximately equivalent to those of homogenized spinach fed at a similar level of iron intake.

Supplements of homogenized vegetables added to the milk diet of 180 infants between the ages of 2 and 7 months, over a period of two months, prevented the expected development of anemia in all age groups and to a somewhat greater extent than did similar supplements of home-strained vegetables added to the milk diet of 145 infants of the same age groups.

Homogenized vegetables given to even younger infants (4 to 8 weeks of age) resulted in increased hemoglobin and erythrocytes in all groups. This was in contrast to the decreases in hemoglobin and erythrocytes, which have been noted by several workers in infants of this age receiving a milk diet without vegetable supplements.

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The
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North Dakota State Medical Ass'n
South Dakota State Medical Ass'n
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THE ART OF MEDICINE

The more one gets around to medical meetings and clinics, the more he is impressed that the practice of medicine is an art as well as a science.

As one listens to lectures and teachers from various sections of the country, he finds that their methods of handling the same sort of condition varies greatly in many instances. This does not necessarily mean that one man has the correct method and the other one the wrong, but simply means that each has developed the technique in handling the condition that best suits his own particular talents and circumstances. Thus, for instance, a man who is particularly skilled in the use of the cystoscope will be able to show that transurethral resection is the method of choice in handling prostatic hypertrophy. Another man will be able to put out as good reasons for the employment of the perineal route in surgical removal of the gland. Yet a third will maintain with equal justification that the suprapubic route should be the method of choice.

This state of affairs would at first glance seem to be confusing to the physician. However, on further thought, it is a fortunate state of affairs.

The progressive physician, in visiting medical lectures and clinics in various sections of the country, will have called to his attention different methods of handling the same or similar conditions. This will enable him to compare others' methods with his own. By retaining the good points of his own technique and borrowing such points from others as seems to be an improvement, he will thus develop the best method of handling the condition for himself.

We should, therefore, never miss an opportunity of hearing another physician's talk or seeing him work, for it is thus that we make progress.

C. E. S.

SCIENTIFIC NEWS

Readers' interest dictates the kind of news story that the publicist must provide for his readers. For a long time pioneering and adventure held the center of the stage. Now the trend is turning more and more to the achievements of science. The hardship of pioneering and the valor of adventure will always bring forth a sympathetic interest on the part of the reader, but this is the day of the mystery story. News of scientific discoveries and inventions is making the front page. It is based on incontrovertible facts; and it furnishes the thrills and adventures that faced the hardy explorers of unknown lands. The added element of mystery and wonder attracts the reader, making an appeal like that of the slight-of-hand performer's art minus its deception and trickery.

The discovery of new lands enriched immigrants only, while modern scientific discoveries confer beneficence and happiness on the entire human race. The medical profession is more highly respected because of the publicity given to new medical discoveries. When accidents from the use of new products are reported, the public gets an insight into the conservatism of physicians and begins to understand why new remedies are accepted with hesitancy.

Physicians have avoided publicity, fearing the sensationalism that characterizes news. The present trend, however, seems to be to enlighten without exaggeration. News editors with scientific training have become wary of the frequently announced discovery of a panacea for human ills.

A. E. H.

REHABILITATION OF TUBERCULOUS PATIENTS

A wave of enthusiasm is spreading over this nation for the rehabilitation of tuberculous patients. Too often the impression is given the public that all one needs to do is to set up facilities for retraining and re-educating all persons who have tuberculosis. If this were true, the tuberculosis problem would be easily solved.

Unfortunately, the nature of tuberculosis is such as to add great difficulty to any rehabilitation program; therefore, we must be extremely careful not to allow our enthusiasm for rehabilitation to outrun our knowledge of the disease. Indeed, when we are appraised of the cold facts concerning tuberculosis, our enthusiasm immediately is dampened. For example, in the state of Minnesota, Hilleboe found that over a ten-year period 90 per cent of the patients admitted to our sanatorium had moderately or far advanced tuberculosis on admission and 15 per cent of the moderately advanced cases and 58 per cent of the patients with far advanced disease did not leave the institutions alive. It is a matter of general observation that throughout this country from 80 to 85 per cent of sanatorium patients have the disease in an advanced stage on entrance.

The average length of life of persons who have had clinical pulmonary tuberculosis with tubercle bacilli in the sputum is short. Berg of Scandinavia recently reported follow-up work on 6,156 adults with tubercle bacilli in the sputum, who were observed between 1910 and 1934. He found that from 70 to 80 per cent of these patients died within ten years after they were found to have tuberculosis. While the death rate was highest during the early years after the diagnosis, it was still four times as high as the normal death rate among those who survived twenty years. Many of Berg's patients were treated by modern methods.

Hilleboe has recently shown that between 1885 and 1926 the literature reveals that a person with minimal tuberculosis had his risk of dying increased approximately four times, the moderately advanced sixteen times, and the far advanced forty times over that of a person in the general population from which he was drawn. However, he points out that between 1926 and 1935, of the cases discharged from the sanatorium, the minimal case's risk of dying was increased two times, the moderately advanced five times, and the far advanced nine times over that of persons of similar age in the general population.

Thus, it becomes apparent that the rehabilitation or re-educational program is limited to relatively few of our tuberculous patients with our present tuberculosis situation. This is a serious reflection on the tuberculosis work of this nation; it has only one meaning, namely, that as physicians we are not using modern methods in the detection of chronic, pulmonary tuberculosis. It is only when these methods are carried out that our tuberculous individuals will have their disease detected in large numbers at a time when it can be treated more successfully than is now being done; it is only when this is accomplished that a large number of tuberculous patients can be re-educated and rehabilitated successfully.

J. A. M.

Book Reviews

The 1939 Year Book of General Surgery, by Evarts A. Graham, M.D., Chicago; The Year Book Publishers, Inc., 1939. Price $3.00.

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The Year Book series provides a most useful service to American medicine. The *1939 Year Book of General Surgery* is up to the high standards set by previous volumes in this series. Under the editorship of Evarts A. Graham, M.D., this neat little book collates between two covers all that is latest and best in the surgical progress reported in the last calendar year.

The highlights of the 1939 volume, according to the editors, are abstracts of articles concerning: (1) local application of sulfanilamide in the treatment of wound infections; (2) successful ligation of the patent ductus arteriosis; (3) use of vitallium, an alloy of cobalt, chromium and molybdenum, for the metal fixation of fractures; (4) studies on the regeneration of sensation in transplanted skin.

The *Year Book of General Surgery* covers all the phases of surgical practice, beginning with anesthesia and ending with orthopedics. It is nicely printed, well illustrated, and, of course, absolutely up-to-date.

Chemotherapy and Serum Therapy of Pneumonia, by FREDERICK T. LORD, M.D., Clinical Professor of Medicine, Emeritus, Harvard Medical School; ELLIOTT S. ROBINSON, M.D., Ph.D., Director Division of Biologic Laboratories, Massachusetts, Department of Public Health; RODERICK HEFFRON, M.D., Medical Associate, The Commonwealth Fund; New York: The Commonwealth Fund, 1940. $1.00.

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This book is the third in a series of handbooks on pneumonia published by the Commonwealth Fund. The first appeared in 1936 under the title *Lobar Pneumonia and Serum Therapy* and the second in 1938 under the title *Pneumonia and Serum Therapy*.

The present book includes a discussion of chemotherapy and further data on the use of horse and rabbit antiserum as well as information relating to the combined use of sulfapyridine and antiserum. The indications and contra-indications for these various forms of treatment, their relative merits, methods of use, precautions to be observed and results obtained are discussed.

In *Chemotherapy and Serum Therapy of Pneumonia*, physicians will find in concise, usable form, a rounded discussion of the specific drug and serum treatment of pneumonia due to various organisms.

Introduction to Medicine, by DON C. SUTTON, M.D., Associate Professor of Medicine, Northwestern University School of Medicine. Introduction by ADA BELLE MCCLEERY, R.N., Superintendent, Evanston Hospital, Evanston, Illinois; 642 pages, 144 text illustrations and 14 color plates; St. Louis: C. V. Mosby Co., 1940.

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Introduction to Medicine is a texthook of medicine written primarily for nurses. It has been written with the idea that the suhject of medicine must be presented to the nurse from a standpoint somewhat different from that for the medical student. The author has succeeded in his presentation; in a clear, simple style, he discusses the symptoms, complications and course of disease.

Part I gives the student a quick survey of the fundamental background of medicine. Part II describes disease entities, including those required hy the standards of the Committee on Curriculum of the National League on Nursing Education. Symptoms, diagnosis and treatment are covered with a minimum of detail. Treatment, wherever possible, stresses especially nurses' relation to such care.

Nurses in all fields will find this hook a valuable addition to their libraries.

Elmer and Rose Physical Diagnosis, revised by HARRY WALKER, M.D., F.A.C.P., Associate Professor of Medicine, Medical College of Virginia, Richmond, Va.; eighth edition, 792 pages with index, 295 illustrations; St. Louis: C. V. Mosby Co., 1940.

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This is a textbook, pure and simple, and a good one. Originally published in 1917, the book is now in its eighth edition. This edition has been generously revised and re-arranged hy Dr. HARRY WALKER, following previous re-editing (sixth edition) by WARREN P. ELMER.

This latest edition emphasizes the relation of physical examination to the more exact diagnostic aids now available. As pointed out by Dr. WALKER, the more one correlates the findings in patients as shown by instruments of precision with the physical signs found on physical examination, the more independent one becomes of the more refined diagnostic measures.

This latest edition follows the intention of the original author in describing not only the signs of value, but also the more generally known signs whose worth and usefulness has been called into question. This procedure was deemed best because in examining patients, the physician encounters irrelevant as well as relevant findings. He must he familiar with both before information can be assembled and properly evaluated. The hook is well illustrated and well printed and can serve as a most useful text of physical diagnosis.

A Short History of Science, by W. T. SEDGWICK and H. W. TYLER, revised hy H. W. TYLER and R. P. BIGELOW; second edition, maroon cloth, gold-stamped, 61 figures, 456 pages plus appendices and index; New York: The Macmillan Company, 1939. Price, $3.75.

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An unusually melancholy background is reflected in both the first and second editions of this work. The senior author, Dr. W. T. SEDGWICK, died some years after the first edition appeared in 1917; the junior author, Dr. H. W. TYLER, died in 1939 just after the final chapter of the second edition had been completed. ROBERT PAYNE BIGELOW carried the work through publication.

The work begins with the so-called dawn of civilization (an ambiguous but felicitous term) in the Fertile Crescent in Egypt and Southern Mesopotamia, proceeds to Greek and Alexandrian science, and continues to the Twentieth Century, to which latter section is appended a useful appendix on applied science in the present era. Particularly interesting are the chapters on physical and chemical sciences in the Nineteenth Century, and on the advances of natural sciences in the same century.

A tabular chronologic account of epochs in science integrated with contemporary historical events is included.

The book is well written and is a good guide (since it does not pretend to be more) to the salient occurrences and figures in the history of science. Set in Baskerville and ornamented with excellent line illustrations, it is one of the most handsome textbooks this reviewer has seen.

Preclinical Medicine, by MALFORD W. THEWLIS, M.D., Attending Specialist, General Medicine, United States Public Health Hospitals, New York City; 223 pages; Baltimore: Williams and Wilkins Co., 1939. Cloth $3.00 net.

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In his introduction to *Preclinical Medicine*, Dr. THEWLIS states that "The aim of preclinical medicine is to prevent suffering. Care should be taken to make the patient health-conscious—not disease conscious." His thesis is that "patients should be diagnosed and treated at the time when the soil for the actual disease is being conditioned. On detecting a disease soil — one should if possible — suggest what seems most likely to prevent the soil from reaching the conditioning period."

The author's treatment of heredity and constitutional factors in relation to infectious diseases is enlightening. A chapter devoted to the heart and blood vessels in reference to the prevention of heart disease is good—its simplicity is a revelation to our understanding. We might want the author to delve more thoroughly into the actual pathology of the so-called conditioning period—perhaps give a little more information; however, he is well backed by an excellent and complete bibliography. On the whole it is well worth while for every general practitioner to read this book to incorporate its essence with our daily patient would bring us closer to the ideals of medicine.

Congenital Cleft Lip, Cleft Palate and Associated Nasal Deformities, by Dr. H. S. VAUGHAN. Philadelphia: Lea & Febiger, 1939. Price $4.00.

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VAUGHAN's book serves as a most excellent text for anyone wishing to become acquainted with the field of plastic surgery so far as it relates to repair of congenital cleft lip, cleft palate and associated congenital deformities. However, even the experienced plastic surgeon will find in it detailed technics for some operations that have been brought to a higher stage of development in the last few years. There is, for example, an excellent description of the technics of the push-back operation on complete unilateral cleft palate that has already been repaired. The author, who is connected with the New York Postgraduate Hospital and Medical School, has provided a most excellent text so far as review of all previous work in the field is concerned. Procedures demonstrated are all acceptable and there are especially good chapters on anatomy, embryology and histology of the tissues involved. Illustrations are excellent.

News Items

Dr. W. E. Long, Anaconda, was named president-elect of the Montana State Medical association at the annual meeting in Bozeman June 18. Dr. J. I. Wernham, Billings, succeeded Dr. Harold W. Gregg, Butte, as president. Dr. Herbert Caraway, Billings, was elected vice president and Dr. Thomas F. Walker, Great Falls, was re-elected secretary-treasurer. Dr. J. H. Irwin, Great Falls, was named delegate to the American Medical Association and Dr. E. M. Gans, Harlowton, alternate.

Dr. Charles A. Arneson, Bismarck, was elected president of the North Dakota Health Officers association at the annual convention at Minot.

The Mayo Foundation of Rochester is coöperating with the University of Minnesota Medical school in manning a United States Army General Hospital unit. Dr. H. S. Diehl, dean of the medical school, recently announced the agreement after conferences with Dr. Donald Balfour, foundation director.

Dr. Herman Hilleboe, St. Paul, Minnesota, delivered the commencement address at the annual exercises of the Lafayette high school, Red Lake Falls, Minnesota, on May 30.

Examination of 101 crippled children from Aitkin, Crow Wing, Carlton, Mille Lacs, Itasca and Cass counties were conducted in Aitkin, Minnesota, June 8. The clinic was sponsored by the division of social welfare.

Dr. A. J. Herbolsheimer, Minneapolis, has accepted appointment as a medical administrator for the civil aeronautics authority in connection with training of civilian aviators in the national defense program. He is a World war veteran and a major in the army reserve medical corps. He has been a medical examiner for army aviators 15 years.

Physicians from Billings, Columbus, Hardin, Red Lodge, Big Timber, Laurel and Forsyth, Montana, attended the postgraduate course in obstetrics and pediatrics at Billings, May 25. The course was conducted by Dr. William F. Mengert and Dr. Julian D. Boyd of the medical school of the University of Iowa. They toured the state of Montana under sponsorship of the state board of health and the Montana State Medical association.

Two hundred and eight children in Burleigh county, North Dakota, were given medical examinations during the month of June. No treatment was given at these conferences but physical defects were pointed out and instructions in feeding, care and training were given. Prevention of disease also was discussed.

Dr. M. W. Larson, who practiced in Hudson, South Dakota, the past ten years, has moved to Watertown.

Dr. D. Lemiux, Stanley, North Dakota, has taken over the practice of the late Dr. B. D. Verret in Rolla.

Seventy physically handicapped children of Missoula and Western Montana were examined during a two-day diagnostic clinic sponsored by the crippled children division of the state department of public welfare, May 25, in Missoula, Montana. Dr. J. K. Coleman, Butte orthopedic specialist, conducted the examinations.

Dr. C. F. Stroebel, who practiced in Northfield, Minnesota, the past three years, has been awarded a fellowship in medicine by the Mayo Foundation at Rochester.

Dr. John X. Newman, Butte, was elected president of the Montana Public Health association at the annual meeting held in Bozeman in June. Helen M. Murphy, Butte, was named vice-president and Dr. W. F. Cogswell, Helena, secretary.

Dr. A. E. Olson, Duluth, Minnesota, has been reappointed by the county board to a three-year term on the county sanatorium commission.

Dr. E. I. Brodie, formerly of Winnipeg, Canada, has become associated with the Bartron hospital and clinic in Watertown, South Dakota.

The Chouteau County Medical association has been organized at Fort Benton, Montana, with Dr. D. J. Cooper, Big Sandy, as president.

The twenty-fifth annual session of the American College of Physicians will be held in Boston, with general headquarters at the Statler Hotel, April 21-25, 1941. Dr. James D. Bruce of Ann Arbor, Mich., is president of the College and will have charge of the program of general scientific sessions. Dr. William B. Breed of Boston has been appointed general chairman of the session, and will be in charge of the program of clinics and demonstrations in the hospitals and medical schools and of the program of panel and round table discussions to be conducted at the headquarters.

In order that there may be a central source of information with regard to studies of the intravenous drip method of treatment of syphilis ("the five day treatment"), the American Social Hygiene Association at 50 West 50th Street, New York, has been asked to gather and to keep available information regarding this subject. The association requests all physicians and hospitals which are planning or are now carrying on studies of experiments with this method of treatment of syphilis to send brief information regarding the following points to the association at the above address: (1) Name of hospital or other institution. (2) Name of principal physician in charge of the intravenous drip study. (3) Type of case or cases of syphilis treated by the intravenous drip method. (4) Name of drug or drugs used; (a) by the intravenous drip method; (b) by any other method before, during or after intravenous drip therapy; (mention any specific therapy used). (5) Routine laboratory work done on cases of syphilis treated by the intravenous drip method. (6) Usual number of hours of intravenous drip treatment per day per patient. (7) Usual number of days of intravenous drip treatment per patient. (8) Any other pertinent facts.

Dr. John H. Bond, Fargo, North Dakota, has joined the Hanna, Clay and Lancaster clinic.

The 1940 Graduate Fortnight of The New York Academy of Medicine will be held from October 14 to 25, 1940. The subject of this year's Fortnight is "Infections". The purpose of the Fortnight is to make a complete study and authoritative presentation of a subject of outstanding importance in the practice of medicine and surgery. The Fortnight will present a carefully integrated program which will include morning panel discussions, afternoon clinics and clinical demonstrations at many of the hospitals of New York City, evening addresses, and appropriate exhibits. The evenings sessions at the Academy will be addressed by recognized authorities in their special fields, drawn from leading medical centers of the United States. The comprehensive exhibit will include books and roentgenograms; pathological and research material; and clinical and laboratory diagnostic and therapeutic methods. It is also planned to provide demonstrations of exhibits.

Through the coöperation of the Illinois State Department of Public Health, the Division of Child Hygiene; and the Children's Bureau, U. S. Department of Labor, the Department of Obstetrics and Gynecology of the University of Chicago and The Chicago Lying-in Hospital are offering five to six weeks postgraduate courses in obstetrics for practitioners during the next several months. Except for a deposit of $25.00 ($10.00 is returned at the completion of the course) the only expense to the individual will be that of his board and room, and his own personal incidental expenses. The enrollment for each course will be kept small to promote a direct and personal relationship between the practitioners and the staff. Applications and inquiries should be addressed to: Postgraduate Course Department of Obstetrics and Gynecology, 5848 Drexel Avenue, Chicago, Illinois.

The Fifth Pan-American Congress of Tuberculosis To Be Held October 13-17, 1940, at Buenos Aires and Cordoba, Argentina

Under the chairmanship of Dr. Gumersindo Sayago and organized by the Counsel of the Latin-American Union of Tuberculosis Societies (the Argentine Division), formed by Dr. Julio Palacios, Academician Dr. Alejandro A. Raimondi and Dr. Gumersindo Sayago, the Fifth Pan-American Congress of Tuberculosis will meet at Buenos Aires October 13-15 and at Cordoba October 16-17, 1940, having placed the following subjects on the official agenda: (1) Index on Tuberculosis in the Countries of South America. (2) Heredity and Contagion in Tuberculosis. (3) Lung Pictures of the Extrathoracic Forms of Tuberculosis. Each member nation of the U. L. A. S. T. (Latin-American Union of Tuberculosis Societies) will have an official speaker on each subject, and doctors attending the Congress will be able to discuss the subjects on the official agenda.

Necrology

CHARLES BENJAMIN WRIGHT
1876-1940

There was a certain integrity of character and ruggedness of worth that made Dr. Wright stand out as a personality long to be remembered and that has assured him of that earthly immortality of continuing to live within the hearts of his friends. It is said that certain mountain peaks are seldom revealed in their entirety on account of surrounding fogs and mists; in contrast, the outlines of Dr. Wright's character were always in view and there were no mists of indecision about supporting those tenets of life held to be worthwhile.

He gave himself to his patients. Excellent clinical judgment and human understanding gave him qualities similar to those of Osler, his teacher. It followed in natural sequence that he should champion the practice of medicine that would preserve unfettered the relationship between physician and patient. Loyalty to such principles and to friends led him to spend himself freely for organized medicine, through various offices of the county and state societies and as trustee of the American Medical Association. As a citizen of the community he found time to support candidates of his party who stood for similar ideals.

It is to be hoped that similar ideals of service will motivate young men in medicine whatever the changes that may occur in methods of medical practice.

C. A. McKINLAY

Dr. Hiram D. Burns, 50, of Albert Lea, Minnesota, died June 19, 1940. Dr. Burns had practiced in Albert Lea for 25 years.

Dr. J. S. Holbrook, 66, of Mankato, Minnesota, died June 8, 1940. He had practiced in Mankato for 43 years.

Dr. F. W. Brey, Wabasso, Minnesota, died June 8, 1940. He had been active in civic affairs, serving as a member of the school board the past 12 years.

Dr. B. D. Verret, 64, of Rolla, North Dakota, died May 26, 1940. He had practiced in Rolette county for 39 years. He came to Rolla in 1903.

Dr. Arthur Stephen Hamilton, 67, Minneapolis nervous and mental disease specialist, died June 2, 1940. Organizer of the division of neuropathology at the University of Minnesota, Dr. Hamilton was director of the division of nervous and mental diseases at the institution from 1912 until 1935.

Dr. W. A. Beach, 72, veteran physician of Mankato, Minnesota, died June 12, 1940.

A CONVENIENT, SAFE ANTACID FOR THE AMBULATORY PEPTIC ULCER PATIENT

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Amphojel Tablets safely reduce gastric acidity without danger of alkalosis or "secondary acid rise." Amphojel Liquid and Tablets contain neither alkali nor alkaline earths. They are not absorbable. The prominent features of this modern treatment are—Prompt Relief of Pain—Rapid Healing of Ulcer and Safety.

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Registered nurse, University of Minn. Hospital graduate; five years experience in clinic; desires position in doctor's office, Minneapolis or St. Paul. Excellent references. Address Box 680, care of this office.

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As part time laboratory technician, by girl attending University of Minnesota this fall. Has had $2\frac{1}{2}$ years experience in a clinic. Address Box 681, care of this office.

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If personally interested, write for a free package to Mead Johnson & Company, Evansville, Indiana, U. S. A.

SULFAPYRIDINE SODIUM MONOHYDRATE ADDED TO SQUIBB LINE

To round out their line of products for the treatment of pneumonia, E. R. Squibb & Sons, New York, have added Sulfapyridine Sodium Monohydrate. The Squibb list now includes anti-pneumococcic sera (rabbit and horse), Sulfapyridine capsules and tablets, and the new Sulfapyridine Sodium Monohydrate.

Sulfapyridine Sodium Monohydrate (sodium 2-sulfanilyl amino-pyridine monohydrate) is a soluble salt of sulfapyridine, dissolving in water at room temperature to the extent of 54 grams per 100 cc. It is intended exclusively for intravenous injection, in emergencies only, in patients who are severely ill with pneumococcal infections. It should be used only in hospitals and only under the constant supervision of a physician. Under such circumstances and in such patients it has been reported to be "valuable, since it has led to the immediate establishment of adequate blood levels of the therapeutic agent." It should not be used as a routine measure or continued throughout the illness, but should be followed by oral sulfapyridine.

The standard initial dose is 3.8 grams for adult patients. This is on the basis of 0.06 gram of the monohydrate sodium salt per kilogram of body weight and the dose should be individually calculated on this basis.

Sulfapyridine Sodium Monohydrate Squibb is supplied in crystal form in ampuls containing 5 grams.

MEDGAR BUSINESS WIDESPREAD

The Medgar Company of Minneapolis (name derived from *medical garments* which is what the organization manufactures), makes washable service garments for professional men and women and operating gowns for surgeons. In the twenty years that its owners have been engaged in this work a general appreciation for the product has been secured.

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Transactions of the Montana State Medical Association

Sixty-Second Annual Session

Bozeman, Montana

June 17-20, 1940

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A. R. Ross, M.D.
F. H. Malee, M.D.
F. I. Sabo, M.D.

MEDICAL INSURANCE AND LEGAL AFFAIRS COMMITTEE

J. C. MacGregor, M.D.
J. H. Garberson, M.D.
W. P. Smith, M.D.
J. M. Flinn, M.D.
C. S. Houtz, M.D.
F. B. Ross, M.D.
J. H. Bridenbaugh, M.D.
P. E. Kane, M.D.

MATERNAL AND CHILD HEALTH COMMITTEE

F. L. McPhail, M.D.
D. L. Gillespie, M.D.
G. A. Carmichael, M.D.
T. L. Hawkins, M.D.
L. W. Brewer, M.D.
P. L. Eneboe, M.D.
E. A. Hagmann, M.D.
R. L. Towne, M.D.
L. T. Sussex, M.D.
A. L. Gleason, M.D.
S. A. Olsen, M.D.
E. A. Weldon, M.D.
H. M. Teel, M.D.

MEDICAL PUBLICATIONS COMMITTEE

A. R. Foss, M.D.
A. R. Karsted, M.D.
C. H. Nelson, M.D.

U. S. MEDICAL RESERVE COMMITTEE

W. R. Morrison, M.D. R. B. Richardson, M.D.
P. L. Greene, M.D.

MEDICAL ECONOMICS COMMITTEE

J. C. Shields, M.D. J. P. Ritchey, M.D.
J. H. Garberson, M.D. R. B. Durnin, M.D.
F. F. Attix, M.D.

POSTGRADUATE WORK COMMITTEE

F. R. Schemm, M.D. M. D. Winter, M.D.
Wayne Gordon, M.D.

FRACTURE COMMITTEE

R. B. Richardson, M.D. E. M. Gans, M.D.
G. W. Setzer, M.D. H. H. James, M.D.
O. G. Klein, M.D.

TUBERCULOSIS COMMITTEE

F. I. Terrill, M.D. F. L. Andrews, M.D.
P. L. Eneboe, M.D. Wayne Gordon, M.D.

INTER-RELATIONS COMMITTEE ON SCIENTIFIC PAPERS

C. H. Nelson, M.D. A. D. Brewer, M.D.
A. T. Munro, M.D.

PROGRAM COMMITTEE

J. J. Malee, M.D. E. H. Lindstrom, M.D.
H. T. Caraway, M.D.

PUBLIC RELATIONS COMMITTEE

L. W. Brewer, M.D. T. L. Hawkins, M.D.
T. F. Walker, M.D. W. F. Cashmore, M.D.

EXECUTIVE COMMITTEE

J. I. Wernham, M.D., President — T. F. Walker, M.D., Secretary-Treasurer
W. E. Long, M.D., President-Elect — H. W. Gregg, M.D., Past President
J. C. MacGregor, M.D., Past President

COMMITTEE ON INDUSTRIAL HYGIENE

L. T. Sussex, M.D. J. B. Frisbee, M.D.
Harold Schwartz, M.D. A. T. Haas, M.D.

ADVISORY COMMITTEE FOR WELFARE BOARD

T. L. Hawkins, M.D. E. M. Farr, M.D.
J. H. Irwin, M.D.

STATE INSTITUTIONS COMMITTEE

L. G. Russell, M.D. C. C. Wallin, M.D.
M. A. Shillington, M.D.

COMMITTEE ON MILITARY PREPAREDNESS AND DEFENSE ACTIVITY

L. S. Stevens, M.D. R. V. Morledge, M.D.
L. G. Dunlap, M.D. W. A. Lacey, M.D.

MEETING OF THE COUNCIL
Baxter Hotel, Bozeman
Monday, June 17, 9:30 P. M.

The meeting of the Council was called to order by Dr. Harold Gregg. A quorum being present, the Council proceeded with business.

The Treasurer submitted his report, which was adopted, with certain modifications, and made a part of the minutes. A committee consisting of Drs. Cooney, Dunlap, and Hitchcock were appointed to audit the books of the Treasurer and to submit their report to the House of Delegates.

It was moved, seconded, and unanimously carried that Mr. Toomey be reappointed counsel for the Association for another year.

It was moved that the Historical Committee ascertain the cost of publication of "The History of Medicine in Montana," and report it to the Executive Committee and that the Secretary should canvass the Councillors by mail. If the Councillors approved the spending of such money, the Executive Committee is given power to proceed with the expenditures of such funds, the funds to be secured by the sale of bonds.

It was further moved, seconded, and unanimously carried that the Council make available funds from the sale of bonds for passage of medical legislation, if the House of Delegates decide to use funds for legislative purposes. It was further moved that bonds be sold to return $300.00 spent on the medical history to the checking account.

It was moved that the Treasurer be instructed to submit a budget each year to the Council. Upon its approval, expenses must be kept within the budget. The following budget for the ensuing year was adopted:

SECRETARY'S OFFICE:	
Salary	$ 600.00
Traveling expenses	100.00
Telephone	100.00
Stamps	75.00
PRESIDENT'S OFFICE:	
Traveling expenses (Stationery, stamps, etc., supplied by secretary's office)	50.00
Officers' trip	150.00
State meeting	850.00
Attorney fee	300.00
Journal-Lancet	500.00
Flowers	35.00
Telegrams	10.00
Stationery and supplies	75.00
Committees	300.00
Total	$3,145.00

The Council recommended to the House of Delegates that the expenses of the state meeting be limited to $850.00, that Montana men take part in our programs, and that correlating programs from medical schools be discontinued. (The House of Delegates did not approve this recommendation in its entirety, only approving that part limiting the expenses to $850.00).

Petition for a charter was received from Choteau County Medical Society. The Council unanimously voted to issue such a charter to Choteau County.

There being no further business to come before the meeting, upon motion duly made, seconded, and unanimously carried, the meeting adjourned.

SECRETARY-TREASURER'S REPORT TO THE COUNCIL

Owing to the fact that expenditures have been greater than income, there has been a gradually falling balance in the checking account of the Association. At the beginning of my term as Secretary-Treasurer, there was a cash balance of $469.18, outstanding bills of $72.00, in addition to an advanced payment due to the JOURNAL-LANCET of $595.25, thus making a deficit of $126.00. During the course of the year, it became necessary to borrow $500.00, depositing one of our $1,000.00 bonds as security. This loan was secured at 5 per cent interest and has been repaid. However, since at the present time, there is a cash balance of but $814.93, it seems quite certain that another loan must be negotiated to take care of expenses during the year. An additional $500.00 should be collected, which will be sufficient to take care of subscriptions to the JOURNAL-LANCET. The $814.93 will probably be used up in meeting the expenses of the meeting. In spite of our increased revenue, due to the increase of dues from $5.00 to $8.00, certain reductions in expenses must be made if current income is to meet expenses, or it will be necessary to provide additional funds, possibly by establishing a registration fee for the annual meeting.

In my opinion, our capital in the shape of bonds should not be utilized for current expenses.

If the House of Delegates decide to have introduced into the Legislature a new medical practice act, I am of the opinion that funds for expenses connected with the passage of this act should be secured by the sale of one or more bonds. Likewise, it appears probable that the Historical Committee will have ready for publication during the ensuing year, *The Medical History of Montana.* This will entail considerable expense which, in my opinion, should likewise be provided for by the sale of sufficient bonds.

I recommend that $300.00, derived from the sale of bonds, be transferred to our checking account to replace money already expended by the Historical Committee.

It is my opinion that we should go on the Budget Plan, a budget being submitted to the Council at the annual meeting

and that expenses be kept within the budget. I have prepared such a tentative budget for the ensuing year.

I herewith submit to the Council a petition from the physicians of Choteau County for a charter. They have organized the Choteau County Medical Society, elected officers, paid dues, and complied with all the requirements of the Association. I recommend that the Council grant said charter to the Choteau County Medical Society.

I had hoped that a petition for charters might be presented in this meeting from the physicians in Lake County and Phillips County. These physicians appear desirous of forming a society and I recommend that the Councillors in each of these districts contact the physicians residing in the above-mentioned counties and endeavor to establish a county medical society in these counties.

FINANCIAL STATEMENT

July 1, 1939, to June 5, 1940

RECEIPTS

Fergus County		$ 104.00
Hill County		130.00
Musselshell County		40.00
Mount Powell		152.00
Yellowstone Valley		368.00
Silver Bow County		412.00
Big Horn County		32.00
Northeastern Montana		125.00
North Central Montana		53.00
Flathead County		157.00
Park County		80.00
Southeastern Montana		221.00
Cascade County		408.00
Lewis & Clark County		98.00
Western Montana		376.00
Gallatin County		128.00
Choteau County		16.00
Dues		18.00
Dr. H. O. K. Bauer	$ 5.00	
Dr. G. W. Setzer	13.00	
Refunds		107.03
Dr. T. F. Walker	$100.00	
Dr. J. I. Wernham	7.03	
Interest on Bonds		240.00
Great Falls National Bank		500.00
Received from Dr. Hawkins		469.18
Total Receipts		$4,234.21

EXPENDITURES

Secretary's Office:		
Salary		$ 550.00
Traveling Expenses		97.90
Telephone		71.95
Advanced for trip to Chicago		100.00
Stamps		41.00
President's Office:		
Traveling Expenses		90.95
Telephone		22.30
Old Accounts		74.00
Finlen Hotel	$ 7.00	
Telephone	11.00	
Bond — Dr. Hawkins	6.50	
Audit Books — Dr. Hawkins	49.50	
Journal-Lancet		532.00
Flowers		31.44
Dr. Evart	$ 10.68	
Dr. Fligman	5.00	
Dr. Smith	7.50	
Dr. Attix	8.26	
Telegrams		7.39
Secretary's Bond		60.00
Attorney		322.61
Fee	$300.00	
Expenses	22.61	
Refund		5.00
Dr. H. O. K. Bauer		
Officers' Trip		153.64
Equipment		159.25
Filing Case	$ 35.50	
Mimeograph	105.00	
Mimeoscope	18.75	
Supplies		67.00
Tribune	$ 45.50	
Multigraphing Shop	21.50	
Great Falls National Bank		520.15
Cost of Banking	$ 4.14	
Interest	12.71	
Rent of Safety Deposit Box	3.30	
Payment of Loan	500.00	
Public Relations Committee		70.34
Broadcasting	$ 37.50	
Supplies—Rent typewriter, etc.	32.84	
Program Committee		4.75
Stationery		
Medical Practice Committee		18.00
Expenses — Dr. Sussex	$ 10.00	
Meals	8.00	
Economics Committee		33.40
Expenses, Dr. Attix	$ 20.35	
Room, etc., Placer Hotel	13.05	
Executive Committee		60.70
Expenses — Dr. Wernham	$ 28.00	
Expenses — Dr. Wernham	19.00	
Expenses — Dr. Gregg	10.00	
Expenses — Dr. Walker	3.70	
Historical Committee		300.00
Advanced to Judge Calloway		
Cancer Committee		25.51
Mimeographing, supplies		
Total Expenditures		$3,419.28

Total Receipts		$4,234.21
Loan from Bank	$500.00	
Refund from Dr. Walker	100.00	
Check from Dr. H. O. K. Bauer	5.00	
Refund from Dr. Wernham	7.03	
		612.03
Total Income (includes cash on hand, July 1, 1939)		$3,622.18
Total Expenditures		$3,419.28
Repayment of Loan	$500.00	
Advanced to Dr. Walker	100.00	
Refund to Dr. H. O. K. Bauer	5.00	
Refund to Dr. Wernham	7.03	
		612.03
Total Expenses		$2,807.25
Income (includes cash on hand, July 1, 1939)		$3,622.18
Expenses		2,807.25
Cash on Hand		$ 814.93

SECRETARY'S ACCOUNT

Salary	$ 550.00
Trips, traveling expense	97.90
Telephone	71.95
Stamps	10.00
Advanced for trip (refunded)	100.00
Paid out for Economics Committee expenses	10.05
Paid out for Executive Committee expenses	3.70
Paid out for Medical Practice Committee expenses	8.00
Paid out for officers' trip	.74
Total Expenditures	$852.34

PRESIDENT'S ACCOUNT

Trips, traveling expense	$ 90.95
Telephone	22.30
Paid out for Executive Committee expenses	10.00
Paid out for Executive Committee expenses	3.00
Paid out for officers' trip	6.90
Total Expenditures	$ 133.15

MINUTES OF THE HOUSE OF DELEGATES MEETING

Baxter Hotel Bozeman

June 18, 1940

The meeting was called to order by the President, Dr. Harold Gregg, at 9:30 A. M. After credentials were presented and it was found that a quorum was present, Dr. Gregg declared the meeting of the House of Delegates duly opened. The Secretary read the minutes of the previous meeting, which were adopted as read.

The Secretary then read his report, which was adopted as read and ordered to be incorporated in the minutes. Said report follows:

The past year has been rather an active one for the officers and many of the Committees of the Montana State Medical Association. The question of contracts with the Farm Security Administration for care of their clients has occupied considerable time on the part of the officers and the Economics Committee. You are probably all familiar with the agreement entered into between the Farm Security Administration and the Montana State Medical Association and with the master contract which was agreed upon for contracts between county medical societies and local health units operating under the Farm Security Administration. Several meetings between the Economics Committee and the officers of the Farm Security Administration were held. Likewise, numerous conferences between the Secretary and the members of the Farm Security Administration were held. I am informed that the Southeastern Montana Medical Society has entered into a contract with health units in that district. Cascade County Medical Society has agreed to enter into a contract with local health units, all but two of its members participating. Likewise, Yellowstone Valley Medical Society has approved entering into a contract with local health units under the Farm Security Administration. The same is true of Hill County Medical Society and of Choteau County Medical Society, as well as Western Montana Medical Society and Flathead County Medical Society.

The Economics Committee is to be congratulated in having worked out a master contract under the provisions of which medical service will be rendered exactly as in private practice, with this difference only, that the physician's bills are presented to his County Medical Society, where certain funds are on deposit. I feel that physicians who are asked to care for families eligible to enter the health units but who have not done so, will be justified in demanding cash for services rendered.

In my opinion, by entering into contracts to care for Farm Security Administration clients, we have won our first battle in the fight against political medicine. There can be little doubt that those governmental agencies who believe that adequate medical service can be provided only through compulsory health insurance are gathering their forces and biding their time.

Complete physical examinations of one hundred farm families in all states are to be made. We all know that the physical defects found will be numerous. Had we not have entered into the plan worked out by our committee, our enemies, the advocates of compulsory health insurance, could go before Congress and say: "This is the deplorable condition of our farm population as it exists under the system of private practice, and the physicians refuse to do anything about it." Since we are cooperating under the plan worked out by the Farm Security Administration and our committee, such guns will be spiked. Doubtless, however, experience may indicate the necessity of modification in the plan.

There is a large and growing demand on the part of the public for some plan of health insurance for the low income groups. In my opinion, this demand must be met. If the profession and/or insurance companies do not meet this demand, the federal government will. Perhaps the most simple way of meeting this demand is under the plan of caring for farm families already worked out by the Economics Committee. If a sufficient deposit is made, the plan should be feasible, provided some deterant to the demand for excessive and unreasonable medical services can be worked out. Perhaps hospitals can work out a means of furnishing hospital service on a similar basis, each hospital entering into contracts with local health units.

Chiropractors, osteopaths, etc., are growing increasingly bold in their demands since they passed at the last session of the Legislature, a law requiring county commissioners to furnish osteopathic and chiropractic services to county patients. If we are to curb the pernicious activities of this cult, it is high time that we do so.

Your Medical Practice Committee has, in accordance with a resolution adopted at the last meeting, prepared a new medical practice act, including basic science and reregistration. It is believed that such acts can be passed at the coming session of the Legislature if the profession will get behind the proposition one hundred per cent and really work. Likewise, funds must be made available.

Experience has shown that our Association can best function and accomplish results through actively working committees. Some of our committees have been very active and have done excellent work. It is to be hoped that the committees appointed this year will give careful consideration to their duties and map out a program and carry it through.

Dr. George P. Lingenfelder, after presenting his credentials, was introduced to the House as a fraternal delegate from the Colorado State Medical Association. Dr. Lingenfelder spoke briefly regarding the Rocky Mountain Medical Conference and invited Montana State Medical Association to join with Colorado, Wyoming, Utah, and New Mexico in this conference. Mr. Harvey T. Sethman, Executive Secretary of the Colorado State Medical Association, and Dr. Earl Whedon, of the Wyoming State Medical Association, likewise spoke on the subject of the Rocky Mountain Medical Conference.

Later on in the meeting, the resolution regarding the Rocky Mountain Medical Conference was presented, discussed and unanimously adopted.

Resolution adopted September 22, 1937, by the House of Delegates of the Colorado State Medical Society. (Identical resolutions in the names of the respective states were adopted in 1937 at the annual meetings of the Wyoming, Utah, and New Mexico State Medical Societies.)

RESOLUTION

Whereas, the Montana State Medical Association wishes to perpetuate the scientific values and fraternalism of the Rocky Mountain Medical Conference as demonstrated at the first meeting of that Conference held in Denver, Colorado, on July 19, 20, and 21, 1937; and the Utah meeting of September 4, 5, 6, 1939, and

Whereas, the Montana State Medical Association approves the recommendations of said Conference for a plan of perpetuating a liaison organization between the State Medical Societies of New Mexico, Utah, Wyoming, and Colorado, and Montana; now, therefore, be it

Resolved, by the House of Delegates of the Montana State Medical Association:

First, that there is hereby created a continuing special committee to be known as the Committee on Rocky Mountain Medical Conference;

Second, that said committee shall consist of five members serving terms so arranged that the term of one member shall expire each year;

Third, that said committee shall be appointed by the President of the Association, future appointments to fill vacancies or expired terms to be made by the current President;

Fourth, that the current President and Secretary of this Association, shall be, ex-officio, additional members of said committee, and

Fifth, that said committee shall be and hereby is authorized and empowered to represent the Montana State Medical Association in all matters relating to the Rocky Mountain Medical Conference, subject to the By-Laws of the Association.

Assistant Surgeon-General Draper addressed the meeting briefly, discussing the part the medical profession was to play in the coming war; also the relations of the Public Health Service to private practice, and briefly discussed the Wagner Hospital Bill.

Mrs. Henrietta Crockett of the State Tuberculosis Association briefly addressed the meeting and asked its endorsement of a proposed tuberculosis hospital for Indians, to be erected by the government in Montana. The following resolution was unanimously adopted: "Be it resolved that the Montana State Medical Association, through its Executive Committee, endeavor to secure the building of such a hospital in Montana."

Dr. Pampel, of the State Hospital at Warm Springs, addressed the House, telling of conditions at his institution and asking aid of the Montana State Medical Association in securing the passage of an initiative measure to secure building funds for this institution.

The following resolution, as presented by a committee consisting of Dr. F. L. McPhail, Dr. M. A. Shillington, and Dr. H. J. McGregor, was unanimously adopted.

In consideration of the fact that in the United States certain standards have been developed for the care of psychopathic patients; that the Montana State Hospital at Warm Springs does not now meet the minimum of these standards; that the institution is not completely housed in fire-proof buildings; that they do not have adequate equipment for the care of these patients and that they lack sufficient personnel and attendants, and the fact that all of these conditions are due to insufficient biennial appropriations to keep pace with the rapid advance of an era of research and medical progress in the treatment and care of the mentally ill;

Now, therefore, be it resolved by the House of Delegates of the Montana State Medical Association, that the people of Montana be urged to support the bond issue now pending and known as Referendum No. 43, and that the State Legislature be urged to provide an adequate appropriation to care for these psychopathic persons in keeping with recognized standards for such institutions.

The meeting adjourned until 1:30 P. M.

The House of Delegates reconvened in the courthouse in Bozeman at 1:30 P. M. Tuesday, June 18. The meeting was opened by the President, Dr. Harold Gregg. Mr. J. A. Riedal, Secretary of the State Board of Pharmacy, gave a discussion on the sale of dangerous drugs and the matter was referred to the committee on Dentists, Pharmacists, and Nurses, who were asked to present their report at this meeting. They presented the following report, which was adopted.

Your committee considered the recommendations made by the State Pharmacy Board and heartily endorse their efforts to prevent the promiscuous sale or refilling of prescriptions containing injurious or habit-forming drugs.

Realizing that the enforcement of such a measure is a public health problem and that the medical society is not in a financial condition to contribute to its enforcement, we nevertheless endorse the measure and are willing to give our whole-hearted support, legislative or otherwise, which will enable the enforcement of such control measures.

The President, Dr. Harold Gregg, then called for committee reports.

Dr. G. W. Setzer, Cascade County, presented a report of the Fracture Committee, which was unanimously adopted. Said report follows:

The aim of the Fracture Committee is to gradually improve the results of fracture treatment throughout the State. To obtain this objective, the Committee feels that a program should be adopted that aims at the education, not only of the physicians, but the lay groups as well; and also that the program should include recommendations regarding the minimum standards of equipment for hospital treating fractures. This equipment should include not only fracture equipment as such, but also X-ray equipment.

It is well established that the saying "Splint them where they lie" is axiomatic in fracture treatment particularly. In a state like ours, first-aid treatment and transportation of fracture cases is, and has to be to a large extent, done by non-medical persons. Therefore, it is necessary that the laymen know the fundamentals of splinting and moving fracture cases so that the Doctor may receive the patient in the best possible condition. This work can be carried on by the training of groups, such as industrial personnel, ambulance companies, police and fire departments; by the Girl Scouts, Red Cross groups particularly, highway first-aid stations, highway patrol and other lay groups. The general public should also be informed regarding the desirability of proper first-aid care and transportation of fracture cases.

The next thing that is of great aid to the Doctor charged with the responsibility of the fracture case is the proper diagnostic equipment and technique. This, of course, refers to the X-ray equipment and personnel. It is necessary that the proper X-ray be taken at the bedside when necessary or desirable, or in the fracture room, or on the stretcher. This is to eliminate unnecessary and harmful movements of the patient with fractured bones, and implies the use of the portable X-ray machine. A schedule of the minimum X-ray standards is available which contains recommendations regarding size and number of views, the use of the Bucky diaphragm, etc., and can be sent to the District Medical Societies.

Then a Doctor needs good equipment, not only to aid in reduction of fractures, but also for the traction and suspension for skeleton fraction if necessary. All hospitals treating fractures should have on hand at least a minimum standard of such equipment, including overhead casts and Bradford frames, and the staff should know how to use them.

Given all three, *i. e.*, proper first-aid splinting and transportation, good and proper X-ray films and good, readily available equipment for treating fractures, the problems of fracture treatments are a long ways towards being solved. To that end, the Fracture Committee makes the following recommendations:

1. That a fracture committee for each district or county medical society be appointed, and that included on this committee be one member from the staff of each hospital that treats fractures, as well as a member from each medical society to correlate the activities. It should be the duty of this committee to supervise the instruction of lay groups, to maintain the records, and to some extent, at least, to supervise the local hospital fracture equipment and methods, and report annually to the State Fracture Committee before the state meeting. (Simplified form based on that of the American College of Surgeons is presented.)

2. Recommend that the Fracture Committee of the Montana State Medical Association secure first-aid, transportation, and motion picture films, a number of which are available, to be sent to the District Medical Societies, for presentation to the doctors and lay groups.

   a. Recommend that the State Fracture Committee prepare a permanent fracture exhibit, and demonstration be presented at the annual meeting of the Medical Association, and possibly at a district medical societies meetings, in conjunction with the presentation of the films.

   b. Recommend that the Montana State Medical Association make funds available to the State Fracture Committee to defray cost of obtaining the films and preparing the exhibit and demonstration.

   c. Recommend that the State Fracture Committee be authorized to prepare articles for the newspapers, pertaining to first-aid treatment and transportation, to be sent to the district societies' fracture committees, to be released to the local newspapers or as the local committee sees fit.

   d. Recommend that a standard of fracture record form be adopted for use by members of the State Association, so that through their committees the end results for various

methods of reduction and fixation may be correlated and studied.

e. The State Fracture Committee also recommends that at least one paper presented at the State Medical Association annually may be devoted to traumatic or fracture surgery.

A booklet outlining the treatment of fractures, prepared by a committee on the treatment of fractures of the American College of Surgeons is presented. A similar book is prepared by the American Medical Association. This committee feels that this booklet should secure wide distribution, probably through the secretaries of the district medical societies.

Dr. F. I. Terrill gave a report of the Tuberculosis Committee, which was adopted. Said report follows:

At the last meeting your Tuberculosis Committee recommended that each county medical society be asked to form a Tuberculosis Committee. We find that in very few, if any, societies has this been done and we wish to again urge that county societies be impressed with the fact that such a committee will be a great aid to the Association in handling all questions that come up involving tuberculosis.

It is recommended that the State Board of Health furnish all physicians in the state with tuberculin, to be made up fresh and mailed at weekly intervals. We feel that this will stimulate the use of tuberculin in determining those cases in which an X-ray of the chest should be taken.

The Association went on record as approving Dr. Terrill's suggestion that the State Board of Health supply physicians in the state with vials of tuberculin for the Mantoux test, a fresh vial to be supplied weekly.

Dr. C. H. Fredrickson presented a report of the state Cancer Committee, which was adopted. Report follows:

In following the cause of death it is again noted that cancer increased markedly in the year 1939 as compared to 1938, which is in agreement with the general cancer mortality of the United States.

Further education of the public, as well as of the doctors, is the most important factor in hoping to reduce this mortality. Your Cancer Committee has been working on this educational program, and especially in conjunction with the Women's Field Army, which has done exceptional work in this state.

It has approved the funds spent, sent literature for papers, film strips and projectors for public talks to doctors cooperating in the work. The outstanding work was accomplished by committee member C. H. Fredrickson, who compiled data and information which was submitted to each member of the association as information and material for educational talks.

The Committee hopes to do further educational work, and has been investigating cancer handbooks such as has been distributed to doctors of the state of California, the state of Washington, and other states.

Dr. J. H. Irwin presented a report of the History of Medicine and Biographies Committee. The report was adopted. Report follows:

We have been actively working on the *History of the Pioneer Physician of Montana* and have Judge Lew L. Callaway of Helena compiling the material which has been gathered. The material is rapidly taking form and will be ready for publication this year. We expect to have the "Foreword" written, the "Index" formed, and the material in shape for presentation to the printers in July or August.

A work of this type, naturally, consumes a great deal of time, and the final expense of publication will be considerable. Already we are receiving numerous requests for the Libraries of the state. I believe that the initial publication of at least five hundred copies should be considered. The expenditures which have been incurred will be reported on by the Secretary of this Association.

Inasmuch as we are unable to determine the cost of publication at the present time, the number of volumes which will be sold, and those which will be placed free in the Public Libraries of the state, the Committee wishes to recommend that the power of action be placed in the Executive Committee so that it will not be necessary to call a meeting of the House of Delegates for final decision on the publication.

Dr. J. C. MacGregor presented a report of the Medical Insurance Committee. The report, which follows, was adopted.

One year ago, at the Butte meeting, Mr. Glover appeared before our committee and reported that malpractice was on the increase—sixteen suits threatened or filed. The year before there were only four suits. This year we have to report:

Threats: 3 Miles City; 1 Lewistown; 1 Glasgow; 1 Hospital; 1 Montana State Dental Association.

Suits: 1 Glasgow; 1 Helena; 1 Montana Hospital; Several hang-over cases.

One suit at Great Falls went to trial with Mr. Glover, for the Aetna, defending successfully, and resulting in acquittal. In this case, as in all but one analyzed by the Council, no basis for malpractice existed. Here again the ever present independent doctor furnished the incentive. It seems that we will never learn that such tactics can only react against us.

We have had a continued coöperation from most of the State Bar Association in malpractice suits, as endorsed by the case in Lewistown, in which the prosecuting attorney wrote me himself, and requested an investigation, which was carried out, at least three months before the doctor, threatened, knew anything about the case.

Since the Great Falls case, suits have seemed to melt away like snow under hot water, proving the necessity of going to court in all cases without a basis for suit.

No reductions in the cost of insurance can be made at the present time.

During the year no committee meetings were held. Members were contacted by correspondence. Few trips were made. The committee incurred no expense to the State Association.

Dr. Frank McPhail presented a report of the Maternal and Child Welfare Committee. The report was adopted. Report follows:

Our maternal death rate has decreased over the last five year period from 52 to 35 per 10,000 live births. In our state, with almost 11,000 live births per year, this means that approximately 19 mothers are saved each year by lowering our maternal mortality rate. The infant mortality rate has been reduced from 60 per 1,000 live births in 1935 to 45.2 in 1939. This represents a saving of approximately 165 lives per year. Thus by lowering our maternal and infant mortality rates, we have in five years' time, brought about a saving of approximately 185 lives per year. Comparing our results with other states, we find that Montana stands in a very favorable position insofar as the maternal mortality rate is concerned. Unfortunately, our infant mortality rate is still much higher than that attained by many other states. Further reduction of our maternal and infant deaths is most certainly an obstetrical or maternal care problem. This is true in regard to the infant mortality, as we have made no appreciable reduction in the infant deaths which occur during the first week of life. It seems reasonable that these deaths should be charged to obstetrical complications.

There was a slight reduction in our maternal mortality during the year 1939. Our maternal mortality for the first five months of 1940 is slightly lower than for the same period in 1939.

For the first five months in 1939, there were 263 infant deaths reported as compared to 195 infant deaths for the same period in 1940. This looks hopeful but the next figure is rather disturbing. For the first five months in 1939, 80 stillbirths were reported as compared to 106 for the same period this year. This makes a total of 343 infant deaths and stillbirths for the first five months of 1939, as compared with 301 infant deaths and stillbirths for the same period in 1940. It is possible that the new stillbirths certificate has inspired more extensive reporting of stillbirths, and that we have therefore improved our rate much more than we realize, but the significance of the total will not be apparent until we are able to analyze the comparative time at which stillbirths have occurred. The total infant mortality rate in 1939 was slightly higher than that in 1938.

Hospital Care Facilities

The Subcommittee on Hospital Study, with Dr. Glenn A. Carmichael in charge, has met on one occasion with Drs. Gerdes and Hershey. A tentative classification of all hospitals

in the state has been drawn up. It is the aim of the committee, with the aid of the Montana Hospital Association, to place each hospital in its proper classification. This has been done primarily to interest hospital executives and local physicians, in hospital problems related to obstetric care and the care of the newborn with a view to eventual improvement in facilities. The hospital administrators are interested and coöperative. Your Committee recommends that legislation be sponsored, providing for license and supervision of maternity homes and hospitals for maternity patients with the understanding that the standards for license will be mainly as a protection for the hospital against unsatisfactory maternity homes which are now in competition with them. Regulation for license can be on the basis of various class hospitals, and of course, it is understood that all hospitals approved by the A. M. A. and American College of Surgeons are no doubt automatically eligible for license. Standards for licensing will be made to meet the needs of the small hospital in rural areas. This will undoubtedly tend to raise the general standards for care.

Premature Care

If we are to make any appreciable reduction in our infant mortality we must save more premature babies. Dr. D. Gillespie has been acting as Chairman of the Subcommittee on Premature Care. Approximately 30 per cent of our infant deaths are recorded as due to prematurity. More detailed study of the premature deaths is indicated to determine the factors related to prematurity and to help to determine the actual cause of the deaths. Dr. Gillespie has corresponded with the hospitals in the state and finds that approximately nine hospitals would purchase premature beds. Fifteen hospitals were as yet undecided and twenty-two hospitals have not responded to the question. The Committee has found that it is possible to build an incubator for hospital use through the State College at Bozeman at a great saving of money. The building of this incubator for hospital use has been held up as the Children's Bureau in coöperation with the Bureau of Standards is making careful tests to recommend further improvement.

Funds have been made available so that we can provide each County having a nursing service portable incubators for transportation or home use. Nursing Institutes were given for the nurses on nursing care for premature babies. These were well attended by many hospital nurses, as well as all public health nurses.

Postgraduate Education

Dr. T. L. Hawkins, acting as Chairman of the Subcommittee on Postgraduate Education, arranged with Dr. W. F. Mengert and Dr. J. D. Boyd of the University of Iowa to conduct a postgraduate session in the state, which were attended by 159 physicians.

The meetings were sectional in character in order to bring to doctors throughout the state with little expense and loss of time from their practice, the lectures of these two outstanding men in their respective fields. Your Committee feels that these meetings should be brought to the doctors rather than forcing the doctors to travel distances and lose considerable time in attendance. Along this particular line it might be pointed out that the number in attendance is not a criterion of the success of the meeting in that a few may a receive a great deal of benefit with a minimum of loss of time and expense to the doctor. Frequently a good meeting will be passed by because the doctor may ill-afford the cost or the loss of time from his practice. The cost of the Medical Association is nil, and if one maternal or infant life may have been saved as a result of these postgraduate courses, they will not have been in vain. It is the viewpoint of this committee that in the future programs should be held at different places so that the state may be covered in its entirety.

Maternal Care

Each year brings new and significant economic problems to the Medical Association. There are three points in this connection which I think should be considered immediately in our recommendations:

1. Some Boards of County Commissioners refuse to provide hospitalization for obstetric patients, except in dire emergency or for cesarean section. Through the State Medical Association the significance of their ruling might be brought home, especially when the County Physician at the same time refuses to do home deliveries.

2. Consideration should be given in the contract drawn up by County Physicians regarding their responsibility for obstetric cases with adequate provision for their protection, as well as the patient, whether on the basis of providing hospitalization for all cases, or providing for adequate compensation for home deliveries over and apart from their routine duties. If this provision is made, it seems that complete care throughout the period of pregnancy should be specified.

3. This same type of provision should also be suggested for contracts drawn through the F. S. A. as we have found that it is in this group of people that many neglect proper antepartum care.

It is the opinion of your Committee that a complete maternal care study should be made in the state. This study was authorized by the House of Delegates' meeting in Butte in June, 1939. Owing to the fact that it will require considerable information if the study is to be of value, the Committee has decided to present the question to the House of Delegates once again, in order that there will be no misunderstanding and request that the House of Delegates once again go on record in favor of making such a study. The objectives of this maternal care study are:

1. To determine the adequacy of maternal care during the prenatal, natal, and postnatal period.
2. To determine the factors which influence this care, whether they be economic, social, medical, or educational.
3. To determine the adequacy or inadequacy of facilities for care in the 56 counties of the state.
4. To determine the need regarding the maternal care program in Montana in order that the medical profession of the state will be in a position to make recommendations regarding the development of a sound maternal care program suited to the needs of this state and at the same time protect the best interests of the physician and the patient.

In order to answer all of the questions involved, a questionnaire will have to be answered on each birth. The questionnaire will be made as simple as possible to conserve time. A letter will be sent to every physician with a sample of the questionnaire asking for coöperation from those who do obstetrics. Unless the physician participates in full, the findings will be incomplete and will give a false picture. This study and the report is entirely for the medical profession. By making such a study the physicians of Montana will make an outstanding contribution to the entire medical profession and will be protecting their interest in any program which is undertaken in the state.

There has been an increasing interest and participation by the physicians in the state in the public health aspects of Maternal and Child care. All policies undertaken by the Maternal and Child Health Division of the State Board of Health are presented to this Committee and drawn up in consultation with this Committee. It is our intention to adhere to sound policies in the practice of medicine, as well as progressive trends in public health, so that we may in time approach the irreducible minimum insofar as maternal and infant deaths are concerned.

Dr. R. L. Towne, acting as Chairman of the Subcommittee on Maternal Mortality Study, reports that to date in 1940 he has received information on thirteen of the fourteen deaths.

Dr. E. A. Hagmann, Chairman of the Subcommittee on Infant Mortality reports that approximately 76 per cent of the questionnaires relative to infant deaths, neonatal deaths, and stillbirths have been answered. Your Committee wishes to thank the members of the Montana State Medical Association for their kind coöperation in the study made to date. Without that coöperation no conclusion could be drawn. We ask for your continued coöperation in carrying on our studies and we feel that within the next few years it will be possible to reduce the maternal and infant mortality rate a great deal more. We ask in particular a specific vote on the following recommendations:

1. The Committee recommends that legislation be sponsored, providing for license and supervision of maternity homes and hospitals receiving maternity patients with the understanding that the standard for license will be mainly as a protection

for the hospital against the very unsatisfactory maternity homes which are now in competition with them.

2. Your Committee recommends that an adequate maternal care study be started about September 1, that it should carry on for one year. This maternal care study is of particular importance because significant economic problems are involved, due to the relationship of a high maternal mortality rate to inadequate antepartum care.

3. In order to give better representation through the state, your Committee recommends that its numbers be increased so that there may be a representative on the Committee from each section of the state.

Dr. McPhail offered the following amendment to the by-laws: That Section 10 be so amended as to read: "This committee shall consist of twelve members, instead of five members, as at present." The amendment was read, approved, and unanimously adopted by the Delegates, Wednesday, June 19.

Dr. L. W. Brewer presented a report of the Public Relations Committee. The report, which follows, was adopted.

During February, March, and April, a weekly article was sent to the following newspapers: Butte Daily Post, Billings Gazette, Helena Independent, Record-Herald, Helena, Daily Missoulian, Bozeman Chronicle, on these subjects: Scarlet Fever, Influenza, Tetanus, Trichiniasis, Carbon Monoxide Poisoning, Vitamin E and Dystrophy of Muscles, Rickets, Undulant Fever, Bronchial Asthma, and Rocky Mountain Spotted Fever, and an article was sent every two weeks to be given over the following radio stations: KFBB (Great Falls), KGHL (Billings) on these subjects: Pneumonia, Rheumatic Fever, Tuberculosis, Smallpox and Vaccination, Diabetes, and Allergy and Hay Fever.

Dr. J. C. Shields presented a report of the Medical Economics Committee and called attention to the fact that county medical societies, in entering into contracts under health units of the Farm Security Administration, were to incorporate into the contract a minimum fee schedule of the Montana State Medical Association. Considerable discussion followed and Dr. Shillington, the Director of the Southeastern Montana Medical Society under their contract with the health units of the Farm Security Administration, was asked to consult the Economics Committee. It was decided that no new fee schedule should be printed by county societies but that if physicians entering into a contract with the health units under the Farm Security Administration wish to make a gentleman's agreement between themselves as to fees charged, that there would be no objection on the part of the Montana State Medical Association. A report of the Medical Economics Committee follows:

In accordance with the instructions of the House of Delegates of the Montana Medical Association, your State Economics Committee met with the officials of the Farm Security Administration to discuss the feasibility of a blanket contract for local health groups at a certain fixed fee.

After several meetings with the officials of the Farm Security Administration, a master contract was negotiated for the State of Montana. This contract is to serve as a guide for each committee or district medical society in order to enter into an agreement with each local health group sponsored by the Farm Security Administration.

It was agreed that reasonable surgical and medical services would be furnished to each family for the sum of $30.00 per year, paid in advance. The standard fee schedule of the Medical Association of Montana enforced in 1939 becomes a part of this contract. No county medical society can alter in any way the fee schedule then in force, nor can the Farm Security Administration alter the $30.00 per family agreed upon. It will be impossible to change the fee schedule or the total payment per family, $30.00 per year, until the term of these contracts expires.

The remainder of the contract has to do with the election of a medical director and auditing committee to carry out the business agreement of the contract. This contract covers only medicine and surgery, and specifically excludes *hospitalization, drugs, serums, appliances, nursing,* and *dental care.*

A copy of this master contract was mailed to the Secretary of each County Medical Society in the State of Montana. This master contract can only be changed or altered in minor details. There can be no change in the total amount paid by each family for medical care. No county or district medical society can alter or change the minimum fee schedule which was in force in 1939, until the term of said contract expires.

Your committee was also requested by the House of Delegates in 1939, to make a study of Group Hospitalization. The Committee met with a Committee appointed by the Montana Hospital Association. After due consideration the Hospital Association appointed a subcommittee who with an attorney, drafted by-laws and articles of incorporation in order to form a non-profit hospital corporation under the laws of Montana.

Your Economics Committee believes that the Medical Association of Montana has done all that the Montana Hospital Association has requested. If the Hospital Association desires further assistance they will be glad to give further aid.

Dr. A. R. Foss presented a report of the Medical Practice Committee, consisting of Dr. Garberson, Dr. Foss and Dr. Sussex. The report follows:

The committee consisting of Dr. Garberson, Miles City, Chairman, Dr. Sussex, Havre, and Dr. Foss, Missoula, together with your President, Dr. Harold Gregg, and your Secretary, Dr. Walker, has reviewed carefully the Medical Practice Acts and Basic Science Acts of the several states and with the help of Mr. Toomey, Helena attorney, have drawn up two separate Acts, one a Medical Practice Act, including a revised definition of the practice of medicine and an annual reregistration clause. The second act provides for a basic science board which is to examine and license all applicants in the basic sciences, before they can legally appear before their respective licensing board.

We recommend introduction of the basic science bill at the meeting of the next legislature in 1941; a copy of this bill is appended to this report.

We recommend serious consideration of the revised Medical Practice Act. Dr. Garberson, Chairman of the Committee, who is unable to be here in person, is strongly in favor of this bill. The committee is in favor of the reregistration feature and the change in the definition of the practice of medicine as stated in the new bill, copy of which is appended.

In the absence of Dr. Garberson, the other two members of the committee feel that it is questionable whether any attempt should be made to change the entire Medical Practice Act at the next session of the legislature, as the changes in the new act would not be consequential except the reregistration feature and the change in the definition of the practice of medicine. These features could be introduced as an amendment to the present act.

After considerable discussion it was moved, seconded, and unanimously carried, that the Executive Committee, after consultation with the Legislative Committee and the State Board of Medical Examiners were, if they saw fit, authorized to introduce in the coming session of the Legislature, a basic science law and a new medical practice act or amendment to the old medical practice act, such new act or amendment to incorporate reregistration. They were authorized to expend such funds as were deemed necessary to secure the passage of this act, said funds to be secured by the sale of bonds.

Dr. S. A. Cooney gave the following report of the Legislative Committee, which was adopted:

Dr. Cooney reported that he was informed that Senator Murray was responsible for the provision of the National Hospital Act that permits an osteopath to be appointed to the Board. A letter from Senator Murray, in which he denied

responsibility for such provision in the National Hospital Act, together with copies of letters sent to Senator Murray by various physicians, expressing appreciation of his coöperation with the medical profession, were read.

It was moved, seconded, and carried that further investigation of the matter be conducted.

Dr. Cooney reported that he had sent a telegram to Senator Murray, expressing the objection of all physicians in Montana to incorporate the above-mentioned provision in the National Hospital Act.

Dr. Cooney reported that the measure providing participation of osteopaths in compensation work was passed at the last few minutes of the session of the legislature without anyone of the legislative committee knowing of its having been introduced.

Dr. L. T. Sussex presented the report of the Industrial Hygiene Committee, which was adopted. Said report follows:

This is a new committee and a short explanation to the House of Delegates of its purpose is probably in order.

At the last session of the Legislature, a bill was enacted which created an Industrial Hygiene Division of the State Board of Health and which also made industrial diseases reportable to the State Board of Health.

This Board now has in the state a fulltime Director and Industrial Engineer—trained men in their fields.

The Board of Industrial Hygiene has an advisory Committee of five members: two members representing Industry and the Chairman of the Industrial Hygiene Committee of the State Medical Association as the fifth member.

A Council on Industrial Health has been functioning in the American Medical Association and sponsors yearly a Congress on Industrial Health. The Council is coöperating with the National Association of Manufacturers Congress of American Industry, the National Safety Council and other organizations in this field.

A program for state associations has been outlined by the Council of Industrial Health of the A. M. A. These main points are:

1. To develop on the part of all physicians a good understanding of the proper functions of medical organization in industry.
2. To train physicians to recognize and report occupational diseases promptly.
3. To train industry and labor to the value of industrial health conservation.
4. To elevate medical standards under workmen's compensation.
5. To scrutinize all social legislation affecting the health of industrial workers.
6. To clarify relationships between industrial and private practitioners.
7. To improve relationships between physicians and insurance carriers.
8. To establish working relationships with all state agencies interested in industrial health.
9. To extend as far as possible, activities of these same descriptions into County Medical Societies.

The Committee believes that the State Association should coöperate fully in this program.

Dr. Foss presented the following report of the Committee on Dentists, Pharmacists and Nurses, which was adopted.

Your Committee considered the recommendations made by the State Pharmacy Board and heartily endorse their efforts to prevent the promiscuous sale or refilling of prescriptions containing injurious or habit forming drugs.

Realizing that the enforcement of such a measure is a public health problem and that the medical association is not in a financial condition to contribute to its enforcement, we nevertheless endorse the measure and are willing to give our wholehearted support, legislative or otherwise, which will enable the enforcement of such control measures.

Dr. M. G. Danskin, Dr. S. V. Wilking, and Dr. W. H. Stephan were appointed a committee on Resolutions.

Dr. F. K. Waniata of Great Falls gave a brief discussion on the Medical Service Bureaus in Pennsylvania and Michigan. Considerable discussion followed this report. Report follows:

Mr. President, Delegates, and members of the Montana Medical Association, I have been asked by your President to present a few facts and limited explanation of the Michigan Medical Service and the voluntary insured medical service for certain income groups in Pennsylvania—various plans have been and are being formulated in many states in the Union by the various state societies to give medical care to individuals and families in the lower income groups.

The reason for the development of these plans is to prevent, if possible, the development of state medicine. The government and legislature have continued to raise the questions of the inadequate care to persons in the low income groups. Needless to say, if the various medical societies are able to develop plans by which they are able to control the medical service, give better care to the lower income group and still maintain an average fee schedule, the government will be unable to object and the medical service will remain in the *hands of the doctors, where it belongs.*

The State Medical Association of Pennsylvania formed the corporation called the Medical Service Association of Pennsylvania as a non-profit organization for the purpose of establishing and maintaining medical service under the provision of an act passed by the general assembly. This is on a non-stock basis, real property none, personal property $25,000.00, which was put into the fund from the state treasury to start the organization. This is to be paid back at a later date.

Persons eligible to become subscribers: Single person—income under $1500 per year. Husband and wife—income under $2300 per year. Family—income under $3100 per year. Each applicant is to fill out a form to signify good health.

Group basis for subscription: In group under 10—100 per cent of entire group must subscribe. In group under 10 to 25—80 per cent of entire group must subscribe. In group under 25 to 30—75 per cent of entire group must subscribe. In group under 50 to 100—60 per cent of entire group must subscribe. In group under 100 to 200—50 per cent of entire group must subscribe. In group over 200—40 per cent of entire group must subscribe.

Mode of Payment	Applicant	Spouse or Dependent	Oldest Child Family Dependent	Each Child Family Dependent in Addition
Annually	$28.80	$23.04	$17.28	$11.52
Semi-Annually	15.00	12.00	9.00	6.00
Quarterly	7.50	6.00	4.50	3.00
Monthly	2.50	2.00	1.50	1.00

One Individual	$2.50 per month
Husband and wife	4.50 per month
Husband and wife and one child	6.00 per month
Each additional child	1.00 per month

The Michigan plan is based on the same principles. This plan limits the income group eligible as individual subscribers, not to exceed $2,000.00; for a family not to exceed $2,500.00. This plan also contains a first payment clause in which the subscriber must pay the first $5.00 incurred for medical service in any one subscription year. He is then entitled to:

$325 Medical services for individual.
$550 Medical services for husband and wife.
$875 Medical services for a family.

This is in line with the present Montana Compensation Board Action. Cost:

$2.00 per man.
$3.50 per husband and wife.
$4.50 per family.
$1.00 registration fee for first year.

The fee schedule in Pennsylvania is based on the unit—a unit being $2.00. A few examples of the fee are:

Office consultation	$ 2.00 or 1 unit
House visit	3.00
Normal confinement	50.00
Miscarriage	25.00
Tonsil and adenoid, child	25.00
Tonsil and adenoid, adult	35.00
Appendectomy	75.00

Skull fracture	50.00
Colles fracture	30.00
Potts fracture	50.00
X-ray examination, ankle	7.00
X-ray examination, chest, flat	10.00

Benefits are extensive including all necessary medical and surgical and obstetrical care, including office, home, and hospital calls; diagnostic service; clinical laboratory tests; X-rays and X-ray examination and treatments; operations, both minor and major; physical therapy. Obstetrical care and services shall mean and include the medical care of the mother for the first twenty days after the date of birth.

Benefits not included:

1. During the first twelve months from the effective date of this subscription, agreement shall not include medical care and services for conditions arising from pregnancy.
2. During the first year from effective date shall not include elective surgery, adenoidectomy, tonsillectomy, or medical or surgical care for conditions known by the subscriber or the applicant to exist on the effective date of this subscription agreement.
3. Does not include care of cases of mental disorder, or epilepsy, or drug or alcoholic addictions, or venereal diseases, or injuries arising from unlawful acts committed by the subscriber, or tuberculosis, except that tuberculosis shall be treated only up to the time of admission to an institution, or cases where indemnity or care is provided for and paid under the workmen's compensation laws of any state or any employers' compensation or liability acts under federal statutes.
4. No dental work, no drugs, medicine, appliances, eyeglasses, or nursing services.

Needless to say, the pressure from the government will become greater in the next few years because of the great amount of taxation that will be necessary. The individuals that were able to pay the regular fees will become fewer in number and the burdens of the lower group will also become greater. In my humble opinion, I believe only the great crisis that is taking place, that has so occupied our present Congress, that perhaps they will not attempt to pass a federal medical bill. I would like to quote a few figures in relation to incomes in Montana:

The average gross cash income for the Montana farm was $1,899.00 for 1939. There were 46,150 farms with occupied dwelling in the 1935 census. Taking Cascade County as an example, we have: 9,312 persons employed and of that number 2,550 have incomes of under $1,500 per year. Roughly, 40 per cent of the employed are earning less than $1,500.00 per year. With our present standard, how can any man with a family in this group meet a medical bill, such as an appendectomy or the like. (Talk about farmers). I recommend to the general body that a committee be named to further study the plan and determine the possibility for the State of Montana. I have left out many details of each plan because time doesn't permit me to give them all.

Dr. T. F. Walker, Secretary, gave the report of the meeting of the Council, in which the following recommendations were made.

First, that all current expenses of the Medical Association be met by current funds and that a budget be established and lived up to, such budget to be limited to $3,200.00 and that not over $850.00 of the Association's funds to be expended for any one state meeting. This recommendation was adopted.

Second, that certain expenses, such as funds expended to secure legislation and for the publication of *The Medical History of Montana* be secured from the sale of bonds, and that $300.00 expended during the past year on said medical history should be replaced in the current account by money secured from the sale of bonds. This recommendation was adopted.

Discussion regarding the programs followed and it was decided that our present plan of a correlated program supplied by faculty members of a medical school should be continued and that if it was necessary to secure additional funds for this purpose, the same should be secured by a registration fee at the meetings.

Dr. S. V. Wilking of Silver Bow recommended that dues of members of the Association who joined the Association after the time of the annual meeting should be reduced to $4.00 for the remainder of the year. This recommendation was referred to the Council for action.

The next order of business was the election of officers. The following officers were elected.

Dr. W. E. Long, Anaconda—President-Elect.

Dr. H. T. Caraway, Billings—Vice-President.

Dr. T. F. Walker, Great Falls—Secretary-Treasurer.

Dr. J. H. Irwin, Great Falls—Delegate to the A. M. A. for a two year period.

Dr. E. M. Gans, Harlowton—Alternate Delegate to the A. M. A.

The following Councillors were elected: For a three year period—Dr. L. G. Dunlap, Anaconda; Dr. R. D. Knapp, Wolf Point; Dr. L. T. Sussex, Havre; Dr. R. G. Hanley, Billings. For a two year period—Dr. E. D. Hitchcock, Great Falls; Dr. R. G. Scherer, Bozeman; Dr. J. H. Garberson, Miles City; Dr. E. A. Welden, Lewistown.

The following men were elected as candidates for membership in the Montana State Board of Health: Dr. H. W. Gregg, Butte; Dr. W. P. Smith, Columbus; Dr. J. P. Ritchey, Missoula; Dr. T. F. Walker, Great Falls; Dr. E. M. Porter, Great Falls.

The Secretary was instructed to submit a list of their names to the Governor from whom he is required by law to select an appointee to the State Board of Health.

Dr. S. A. Cooney, Chairman of the Auditing Committee of the Council, presented the following report, which was unanimously adopted:

Your Auditing Committee begs to submit the following report: We have audited the report of Secretary-Treasurer Dr. Thomas Walker and find his accounts to be in proper shape and correct. We recommend that his report be accepted.

Dr. J. H. Irwin gave his report as delegate to the meeting of the American Medical Association in New York City. His report follows:

The meeting of the American Medical Association just held in New York City had the largest registration of any medical meeting ever held in U. S. A., and probably the largest in the world, over 12,500 being in attendance.

As I have repeated in the past, I wish again to remind you all that it is one of the best, if not the best, to attend. Not only on account of the outstanding character of the papers that are presented but also because of the remarkable exhibition put on in the Scientific Exhibits. A person could easily spend the entire five days there and make the trip more than worthwhile; and the Commercial Exhibits beat any fair you ever attended.

There were no outstanding features in the House of Delegates this year. Our new President, Dr. Nathan B. Van Etten made a splendid address and I think voiced the opinion of the delegates when he stated that the A. M. A. offered all its facilities of the Federal government and stands ready to cooperate to the limit of its ability in all measures of "National Defense."

Dr. Van Etten warned against a threatened invasion not only with guns but with ideas that would force foreign systems of medical practice upon American physicians. He further said "I believe that the medical profession should go along with the

Government as far as possible for the common good, without sacrificing its individual interest in the care of the sick and its collective interest in the prevention of disease." Dr. Rock Sleyster, retiring president, also asserted that the A. M. A. should in every way coöperate with the Government. Dr. Sleyster reviewed to some extent his work of the past year and recited some of the impressions he had received. One of the things in particular recommended was that the A. M. A. make more of an effort to inform the medical profession of the workings of the A. M. A. and what the A. M. A. is prepared to do for the doctors, even in isolated communities.

I would strongly urge any of you that are in Chicago to go out to the A. M. A. home at 535 N. Dearborn St., and go through the building. You will receive a warm welcome and will be conducted through the entire plant and will, I am sure, be amazed at the unusual amount and variety of work they are doing. The Distinguished Service award was bestowed upon Dr. Chevalier Jackson of Philadelphia, world famous for his work in Bronchoscopy.

A plan was worked out by the office of the Surgeon-General of the U. S. Army and presented to the House by Col. G. C. Dunham. The plan calls for the organization of the medical profession in America into a nation-wide Volunteer Medical Service Corps, under the auspices of the A. M. A., working through component State and County societies. "It appears," the army medical mobilization plan says, "that in event of a national emergency of great magnitude it would be very necessary to conserve the medical profession. This plan would distribute the professional load and if properly administered, should prevent stripping of rural and isolated communities of their necessary medical personnel." A committee of ten, headed by Dr. Irvin Abell, ex-president of the A. M. A. (whom most of you met in Missoula two years ago), was appointed. The other members are Dr. Stanley Osborn of Hartford, Conn., Dr. Walter G. Phippen of Boston, Dr. Harry B. Stone of Baltimore, Dr. James E. Paullin of Atlanta, Dr. Fred Rankin of Lexington, Dr. Roy Fonts of Omaha, Dr. Sam Thompson of Texas, Dr. Charles A. Dukes of California and Dr. John O'Shea of Washington. The ex-officio members are Dr. Nathan B. Van Etten, President of the A. M. A., Dr. Alvin West, Secretary of the A. M. A., Dr. Arthur Booth and Dr. Hayden of the Board of Trustees, and Dr. M. Fishbein, Editor of the *Journal of the A. M. A.* A considerable number of resolutions were presented and acted upon by the House. A complete record of the same will be found in the *Journal of the A. M. A.* soon.

The House of Delegates voted favorably on a proposed amendment to the A. M. A.'s constitution, providing that only doctors of medicine, licensed to practice medicine, shall be eligible to be members of the Association. The amendment, to become effective, must be passed a second time at next year's meeting. If adopted in Cleveland next year, it will eliminate osteopaths from membership.

In a resolution relating to the Wagner-George Bill, providing for a $10,000,000 construction program of small hospitals in various parts of the country, the House recommended that the hospitals be built only in communities where actual need can be shown, and where local government units can demonstrate their ability and willingness to maintain the institutions when built. The House also voted that "the amendment providing for a possible osteopathic representation on the Council (for the small hospitals) is entirely unwarranted and should be eliminated from the bill."

The House also urged that each State Medical Association create a special committee to act in an advisory capacity to State Health Department on any hospital construction projects that may be contemplated under the pending legislation, and that the special committee appointed by the House of Delegates last year be continued "so as to be on call by the President of the U. S. A. or other governmental authorities." Also that the Council on the Small Hospitals, provided for in the bill, be appointed by the President of the U. S. A.

The Wagner-George Bill was recently passed by the Senate and is now pending before the House of Representatives.

Dr. Frank Howard Lahey was unanimously elected president-elect and Dr. Park G. Smith of Cincinnati elected vice-president. Dr. William F. Braash of Rochester, Minnesota, was elected trustee to fill the unexpired term of the late Dr. Charles B. Wright of Minneapolis. Dr. James R. Bloss of Virginia and Dr. Ralph A. Fenton of Oregon were re-elected trustees.

San Francisco was chosen as the meeting place for 1943. The meeting next year will be in Cleveland and in 1942 in Atlantic City.

There being no further business to come before the meeting, a motion to adjourn was made, seconded, and unanimously carried.

MINUTES OF THE ANNUAL SCIENTIFIC SESSION

Baxter Hotel, Bozeman

June 19, 1940

The meeting was opened Wednesday, June 19, by Dr. H. W. Gregg, the President, in the assembly room of the Baxter Hotel. An address of welcome was extended to the members of the Association by the Mayor of the city of Bozeman.

The following papers were read: "Problems in Biliary Tract Surgery," by Dr. N. Logan Leven, clinical assistant professor of surgery, University of Minnesota. This paper was discussed by Dr. C. H. Fredrickson of Missoula and Dr. W. E. Long of Anaconda. "Diagnosis and Treatment of Carcinoma of Bowel," by Dr. Walter A. Fansler, clinical assistant professor of surgery, University of Minnesota. "Cause and Prevention of Newborn and Premature Deaths," by Dr. William A. O'Brien, associate professor of pathology, University of Minnesota. This paper was discussed by Dr. Edith Hershey of Helena and Dr. F. M. McPhail of Great Falls.

At 11:45 A. M. the meeting adjourned until 2:00 P. M. During the noon recess, the Minnesota Alumni Luncheon was held in the Gallatin Gateway Inn.

The meeting reconvened at 2:00 P. M. in the assembly room of the Hotel Baxter and the following papers were given: "Cranio-cerebral Injuries," by Dr. Ernest M. Hammes, professor of nervous and mental diseases, University of Minnesota. This paper was discussed by Dr. J. C. Shields of Butte and Dr. L. T. Sussex of Havre. "Changes in Morbidity and Mortality Problems Incident to Aging of the Population," by Dr. William A. O'Brien, associate professor of pathology, University of Minnesota.

The meeting adjourned at 4:00 P. M.

The banquet was held in the banquet room of the Hotel Baxter at 7:00 P. M., Dr. Roy Grigg of the Gallatin County Medical Society acting as toastmaster. Brief talks were given by the retiring president, Dr. H. W. Gregg, incoming president, Dr. J. I. Wernham, president-elect, Dr. W. E. Long, secretary, Dr. T. F. Walker, Dr. N. L. Leven, Dr. W. A. Fansler, Dr. W. A. O'Brien, Dr. C. J. Watson, and Dr. E. M. Hammes. The principal speaker of the evening was Dr. L. W. Larson of Bismarck, secretary of the North Dakota State Medical Association.

The meeting reconvened Thursday, June 20, in the assembly room of the Hotel Baxter with Dr. Harold Gregg, President, in the chair. The following papers were given: "Jaundice Considered from the Standpoint of Diagnosis and Pathologic Physiology," by Dr. C. J.

Watson, associate professor of medicine, University of Minnesota. This paper was discussed by Dr. M. A. Shillington of Glendive and Dr. Wayne Gordon of Billings. "Modern Treatment of Psychiatric Disorders," by Dr. Ernest M. Hammes, professor of nervous and mental diseases, University of Minnesota. This paper was discussed by Dr. E. R. Downey. "Skin Transplantation," by Dr. N. Logan Leven, clinical assistant professor of surgery, University of Minnesota. This paper was discussed by Dr. L. W. Allard of Billings and Dr. A. R. Karsted of Butte.

Mrs. Anna Peterson, commander of the Women's Field Army for the Prevention of Cancer, was introduced to the assembly by Dr. C. H. Fredrickson, chairman of the Cancer Committee of the Montana State Medical Association. Mrs. Peterson addressed the assembly, explained the nature of her work, thanked the physicians for their coöperation and expressed the hope that such coöperation would be continued in the future. Dr. Fredrickson presented Mrs. Peterson with a distinguished service medal for the services rendered in this work.

The meeting adjourned until 2:00 P. M.

The meeting reconvened at 2:00 P. M., when the following papers were given: "Treatment of Heart Failure," by Dr. Cecil J. Watson, associate professor of medicine, University of Minnesota. This paper was discussed by Dr. F. R. Schemm of Great Falls and Dr. L. W. Brewer of Missoula. "Office Treatment of Anorectal Disease," by Dr. Walter A. Fansler, clinical associate professor of surgery, University of Minnesota. This paper was discussed by Dr. J. H. Irwin.

The following resolution was presented by Dr. M. G. Danskin, chairman of the Resolutions Committee, and was unanimously adopted.

"Be it resolved, that the Montana State Medical Association extend its appreciation and sincere thanks to the city of Bozeman, Gallatin County Medical Society, County Commissioners of Gallatin County, the management of Hotel Baxter, the press of the city of Bozeman, and the citizens of Bozeman, who have done so much to make for the success of its meeting and the pleasure of its members."

Dr. M. A. Shillington, chairman of the Necrology Committee, presented the following report, which was unanimously adopted.

Since the last assembly of this group of physicians in Butte, Montana, June, 1939, we have lost, through death, six of our beloved friends and fellow members. It is therefore fitting that we pause for a few moments and pay tribute to this memory.

DR. LOUIS HENRY FLIGMAN was born in Roumania in 1878. He graduated from the University of Minnesota in 1901. He was licensed to practice medicine in Montana in 1902 and stayed in Helena until his death July 14, 1939. Dr. Fligman spent much time in graduate study in Europe and in this country. He was president of the Montana State Medical Association in 1935. He was the first physician of Montana to become a Fellow of the American College of Physicians. He was governor for Montana in this organization until his death. Dr. Fligman was particularly loved by the internists of the state, who always looked to him for guidance in policy matters.

DR. JOHN A. DONOVAN, the Nester of Ophthalmologists in Montana, was born in 1871. He received his degree of doctor of medicine from the University of Michigan in 1894. He came to Butte in 1899 and gave forty years of honorable service in the practice of his profession. He has been chairman of the Section of Ophthalmology of the American Medical Association and a member of the State Board of Examiners of Montana. He was a member of the American Academy of Ophthalmology and a Fellow of the American College of Surgeons. He died July 21, 1939.

DR. JOHN A. EVERT was born in New Jersey in 1885. He received his medical education at Minnesota and practiced there from 1913 to 1925. He came to Glendive, Montana, October 1, 1925, as Chief Surgeon at the Northern Pacific Hospital. He soon became active in helping solve the economic problems of the physicians of this state. He was president of the Southeastern Montana Medical Association and in 1937 was president of the Montana State Medical Association. He was a Fellow of the American College of Surgeons. He died August 17, 1939.

DR. HARRY C. SMITH was born in 1872. He graduated from the Belleview Medical College in New York in 1894. Following this he served as a contract surgeon in the Philippine Islands during the insurrection. On returning to the United States, he settled in Missoula in 1904. He became a successful surgeon and at the time of his death was head of the Western Montana Clinic. He was a Fellow of the American College of Surgeons. His death came suddenly following a full day's work on September 13, 1939.

DR. C. E. EMERY was born in Canada in 1894. The family moved to Butte while he was still a youth. He attended the grade schools there. He received his medical degree from Valparaizo University in 1917. He was president of the Silver Bow County Medical Society in 1932. He was active in affairs of the State Association. He was ill for several months and died September 25, 1939. His immediate friends and associates were very fond of him.

DR. ASHLEY W. MORSE was born in 1883. He graduated from the Medical Department of the University of Michigan in 1908. He settled in Butte in 1909 and practiced his specialty of ophthalmology ever since. He has been president of the Montana Academy of Ophthalmology, Pacific Coast Otolaryngology Society, the Silver Bow County Medical Society and also of the Montana State Medical Association. He was a member of the American Academy of Ophthalmology and Otolaryngology. He was a fellow of the American College of Surgeons and he was certified by the American Boards of Ophthalmology and Otolaryngology. He passed away October 12, 1939. As a leader in organized medicine, his loss will long be felt.

We suggest as a tribute that the following be sent to the nearest surviving kin of each of the above deceased physicians:

> The physicians of Montana, at their annual meeting in Bozeman, June 19, 1940, paused in their deliberation to take cognizance of the death of their friend and councillor, Dr. , and to pay their tribute to him. He was loved by all of us who knew him. He was admired for the fine example of ethical behavior which he set for us.
>
> We wish to express our sympathy to you and to assure you that we share to some degree the sorrow which came through his death.

There being no further business to come before the meeting, Dr. Gregg announced the sixty-second annual session adjourned. One hundred eighty-seven members were registered for the session.

MONTANA STATE MEDICAL ASSOCIATION DISTRICT SOCIETY ROSTER--1940

BIG HORN COUNTY MEDICAL SOCIETY

Baker, G. A.
Haverfield, L. E.
Labbitt, L. H.
Schubert, J. W.

CASCADE COUNTY MEDICAL SOCIETY

Allred, I. A.
Anderson, C. E.
Andrews, F. L.
Bateman, H. W.
Blankenhorn, C. E.
Bresee, C. J.
Cooper, D. J.
Coulter, C. F.
Craigo, F. H.
Crary, L. S.
Davis, R. C.
Durnin, R. B.
Gibson, H. V.
Gleason, A. L.
Greaves, J. P.
Hitchcock, E. D.
Holzberger, R. J.
Howard, L. L.
Hurd, F. D.
Irwin, J. H.
Johnson, A. C.
Keenan, F. E.
Larson, E. M.
Little, C. F.
Logan, P. E.
Lord, B. E.
Macaulay, A. M.
MacGregor, J. C.
Mayland, L. L.
McBurney, L. R.
McGregor, H. J.
McGregor, R. J.
McPhail, F. L.
Nagel, C. E.
Peterson, C. H.
Place, B. A.
Porter, E. M.
Richardson, R. B.
Russell, R.
Schemm, F. R.
Setzer, G. W.
Silvernale, F. P.
Strain, E.
Templeton, C. V.
Vasko, J. R.
Walker, D. V. H.
Walker, T. F.
Waniata, F. K.
Weisgerber, A. L.
Williams, W. T.

CHOTEAU COUNTY MEDICAL SOCIETY

Anderson, E. L.
Bassow, C. L.
Kaulbach, J. J.
Worstell, G.

FERGUS COUNTY MEDICAL SOCIETY

Attix, F. F.
Deal, A. W.
Freed, H.
Gans, E. M.
Gans, E. W.
Gans, P. J.
Herring, J. H.
Johnson, R. G.
Piedalue, J.
Porter, E. S.
Soltero, J. R.
Wallin, C. C.
Welden, E. A.
Wilder, C. W.
Willess, H. F.

FLATHEAD COUNTY MEDICAL SOCIETY

Borkon, M.
Brassett, A.
Bottorf, M. W.
Bottorf, P.
Brown, J. W.
Burns, M. O.
Cockrell, E. P.
Conway, W. Q.
Delaney, J. R.
Dodge, A. A.
Griffis, L. G.
Holcomb, M. D.
Huggins, H. D.
Lamb, J. A.
Lees, A. T.
Moore, T. B., Jr.
Moore, T. B., Sr.
Noble, P. C.
Munro, A. T.
Richards, J. L.
Ross, F. B.
Simons, J. B.
Taylor, W. W.
Towne, R. L.
Wright, G. B.

GALLATIN COUNTY MEDICAL SOCIETY

Bole, W. S.
Brewer, A. D.
Eneboe, P. L.
Grigg, E. R.
Heetdirks, B. J.
Kearns, E. J.
Maillet, L. L.
Phillips, J. H.
Sabo, F. I.
Scherer, R. G.
Seerley, C. C.
Seitz, R. E.
Sigler, R. R.
Smith, C. S.
Stanchfield, H.
Whitehead, C. E.
Williams, R. A.

HILL COUNTY MEDICAL SOCIETY

Almas, D. J.
Aubin, F. W.
Benke, R. A.
Briggs, F. W.
Burdick, M. S.
Delaney, J. R.
Doles, E. A.
Forster, W. J.
Hamilton, W. F.
Hoon, A. S.
Houtz, C. S.
Jestrab, G. A.
Lacey, W. A.
MacKenzie, D. S., Jr.
MacKenzie, D. S., Sr.
Sussex, L. T.

LEWIS & CLARK COUNTY MEDICAL SOCIETY

Barbour, G. H.
Berg, D. T.
Bierman, J. M.
Cashmore, W. F.
Cooney, S. A.
Copenhaver, W. M.
Flinn, J. M.
Gallivan, E. L.
Hall, L. F.
Hawkins, T. L.
Hershey, E.
Kilbourne, B. K.
Klein, O. G.
Jump, C. F.
Lindstrom, E. H.
McCabe, J. J.
Monserrate, D. N.
Morris, R. W.
Shearer, B. C.
Thompson, J. G.
Tyler, K. A.

MOUNT POWELL MEDICAL SOCIETY

Anderson, G. A.
Beasley, W. A.
Bolton, L. R.
Crowley, L. G.
Dunlap, L. G.
Getty, R. W.
Holmes, G. V.
Kargacin, T. J.
Keeton, R. G.
Knight, A. C.
Lieurance, E.
Long, W. E.
Malee, J. J.
Malloy, F. G.
O'Rourke, J. L.
Pampel, B. L.
Snodgrass, M. R.
Terrill, F. I.
Unmack, F. L.
Weldhuis, J. G.
Willits, A. J.

MUSSELSHELL COUNTY MEDICAL SOCIETY

Bennett, A. A.
Crouse, S. A.
Fouts, E. R.
Lewis, G. A.
O'Neill, R. T.
Person, E. C.
Vornholt, M. T.

NORTH CENTRAL MONTANA MEDICAL SOCIETY

Dale, E. E.
DuBois, W. L.
Meadows, W. A.
Neraal, P. O.
Olsen, N. A.
Paterson, W. F.
Powell, C. D.
Power, H. W.
Robinson, W. C.
Schrader, H. F.

NORTHEASTERN MONTANA MEDICAL SOCIETY

Benson, O. G.
Cloud, H. B.
Cockrell, T. L.
Darland, F. L.
Knapp, R. D.
Knierim, F. M.
Kreft, A. J.
Krogstad, L. T.
Larson, C. B.
Lawson, C. W.
Mittleman, E. J.
Munch, C. J.
Peterson, R.
Smith, A. N.
Spatz, J. M.
Storkan, J. C.

PARK-SWEETGRASS COUNTY MEDICAL SOCIETY

Baskett, L. W.
Beltzer, C. E.
Claiborn, D.
Cogswell, W. F.
Dyer, R. H.
Greene, P. L.
Harris, W. E.
Leard, S. E.
Pearson, J. A.
Townsend, G. A.
Walker, R. E.
Windsor, G. A.

SILVERBOW COUNTY MEDICAL SOCIETY

Atkins, D. A.
Canty, C. R.
Carmichael, G. A.
Casebeer, H. L.
Coleman, J. K.
Donich, G. M.
Farnsworth, F. B.
Floyd, J. S.
Frisbee, J. B.
Garvey, J. C.
Gillespie, D. L.
Graff, S. F.
Gregg, H. W.
Hale, D. C.
Hill, R. J.
Horst, C. H.
James, H. H.
Joesting, H. C.
Kane, J. J.
Kane, R. C.
Kane, P. E.
Karsted, A. J.
Kroeze, R.
Lapierre, J. C.
Lhotka, J. F.
MacPherson, G. T.
Malee, F. H.
McGill, C.
McMahon, E. S.
Monahan, R. C.
Mondloch, J. L.
O'Keefe, N. J.
Packard, L. R.
Pemberton, C. W.
Peterson, R. F.
Rodes, C. B.
Routledge, G. L.
Saam, T. W.
Schwartz, H.
Schwartz, S. E.
Seivers, A. R.
Seivers, J. R. E.
Shanley, T. J. B.
Shields, J. C.
Simons, H.
Smetters, M.
Smith, L. W.
Spurck, P. T.
Steinberg, S. S.
Stephan, W. H
Thorkelson, J.
Ungherini, V. O.
Wilking, S. V.
Williams, F. J.

SOUTHEASTERN MONTANA MEDICAL SOCIETY

Beagle, J. S.
Benson, R. D.
Blakemore, W. H.
Bridenstine, I. J.
Cotton, W.
Craig, J. W.
Damm, W. P.
Danskin, M. G.
Denman, D. H.
Farrand, B. C.
Garberson, J. H.
Halleck, P. P.
Harper, R. D.
Howard, E. M.
Huene, H. J.
Hunt, J. H.
Lemon, R. G.
Lindeberg, S. B.
Lund, C.
Morrill, R. A.
Neville, J. V.
Noonan, E. F.
Olson, S. A.
Pratt, S. C.
Randall, R. R.
Rowen, E. H
Sandy, B. B.
Shillington, M. A.
Tarbox, B. R.
Thompson, J. R.
Varco, A. R.
Winter, M. D.

WESTERN MONTANA MEDICAL SOCIETY

Alderson, L. R.
Bourdeau, C. L.
Bourdeau, E. J.
Brewer, L. W.
Browning, H. D.
Crecelius, H. A.
Doyle, W. J.
Flynn, J. J.
Foss, A. R.
Fredrickson, C. H.
French, E. J.
George, E. K.
Giles, F. J.
Gordon, D. A.
Graybeal, J. M.
Haas, A. T.
Hall, H. J.
Hanbidge, T. H.
Hayward, H. T.
Hesdorffer, M. B.
Holmes, J. T.
Honeycutt, C. F.
Jennings, F. M.
Kintner, A. R.
Kirkwood, R. C.
Koessler, H. H.
Lipow, E. G.
Lowe, F. H.
Mathews, T. A.
Marshall, J. F. S.
Marshall, W. J.
Martin, L. P.
McPhail, W. N.
Murphy, E. S.
Nelson, J. M.
Noble, P. C.
Ohlmacher, J. P.
Pease, F. D.
Randall, J. G.
Rennick, P. S.
Rew, A. W.
Richards, J. L.
Ritchey, J. P.
Sale, G. G.
Shephard, H. C.
Teel, H. M.
Tefft, C. C.
Thornton, C. R.
Thornton, W. T.
Trenouth, S. M.
Turman, G. F.
Vanderboget, C. L.

YELLOWSTONE VALLEY MEDICAL SOCIETY

Adams, E. M.
Allard, L. W.
Blackstone, A. V.
Bridenbaugh, J. H.
Brunkow, B. H.
Caraway, H. T.
Chapple, R. R.
Clark, A. E.
Culbertson, H. H.
Currie, R. W.
DeMers, J. J.
Drew, H. O.
Dunkle, F.
Farr, E. M.
Ferree, V. D.
Gordon, W.
Graham, J. H.
Griffin, P. E.
Hagmann, E. A.
Hall, E. C.
Hammerel, A. L.
Hamernick, F.
Hanley, R. J.
Hodges, D. E.
Hynes, J. E.
Kronmiller, L. H.
Leeper, D. D.
Levitt, L.
MacDonald, D. J.
MacIntyre, H. E.
Mills, F. A.
Morledge, R. V.
Morrison, J. D.
Morrison, W. R.
Movius, A. J.
Nelson, C. H.
Powers, J. C.
Rathman, O. C.
Rich, E. L.
Richards, W. G.
Russell, G. M.
Russell, L. G.
Smith, W. P.
Souders, S. M.
Stevens, L.
Stripp, A. E.
Stubblebine, J. G.
Vye, T. R.
Weedman, W. F.
Werner, S. L.
Wernham, J. I.

ALPHABETICAL ROSTER
Montana State Medical Association--1940

Adams, E. M.	Red Lodge	Attix, F. F.	Lewistown	Bennett, A. A.	Roundup
Alderson, T. R.	Missoula	Aubin, F. W.	Havre	Benson, O. G.	Plentywood
Alexander, J. L.	Winnett	Baker, G. A.	Hardin	Benson, R. D.	Sidney
Allard, L. W.	Billings	Barbour, G. H.	Helena	Berg, D. T.	Helena
Allred, I. A.	Great Falls	Baskett, L. W.	Big Timber	Bierman, J. M.	Washington, D. C.
Almas, D. J.	Havre	Bassow, C. F.	Fort Benton	Blackstone, A. V.	Columbus
Anderson, C. E.	Great Falls	Bateman, H. W.	Choteau	Blakemore, W. H.	Baker
Anderson, E. L.	Fort Benton	Beagle, J. S.	Sidney	Blankenhorn, C. E.	Great Falls
Anderson, G. A.	Deer Lodge	Beasley, W. A.	Galen	Bole, W. S.	Bozeman
Andrews, F. L.	Great Falls	Beltzer, C. E.	Washoe	Bolton, L. R.	Deer Lodge
Atkins, D. A.	Butte	Benke, R. A.	Chester	Borkon, M.	Whitefish

Bottorf, M. W. Kalispell
Bottorf, P. Kalispell
Bourdeau, C. L. Missoula
Bourdeau, E. J. Missoula
Bradbury, J. T. Willow Creek
Brassett, A. J. Kalispell
Bresee, C. J. Great Falls
Brewer, A. D. Bozeman
Brewer, L. W. Missoula
Bridenbaugh, J. H. Billings
Bridenstine, I. J. Terry
Briggs, F. W. Havre
Brown, J. W. Whitefish
Browning, H. D. Hamilton
Brunkow, B. H. Billings
Burdick, M. S. Harlem
Burns, M. O. Kalispell
Canty, C. R. Butte
Caraway, H. T. Billings
Carmichael, G. A. Butte
Casebeer, H. L. Butte
Cashmore, W. F. Helena
Chapple, R. R. Billings
Claiborn, D. R. Big Timber
Clark, A. E. Billings
Cloud, H. B. Wolf Point
Cockrell, E. P. Kalispell
Cockrell, T. L. Hinsdale
Cogswell, W. F. Helena
Coleman, J. K. Butte
Conway, W. Q. Kalispell
Cooney, S. A. Helena
Cooper, D. J. Big Sandy
Copenhaver, W. M. Helena
Cotton, W. Circle
Coulter, C. F. Great Falls
Craig, J. K. Circle
Craigo, F. H. Great Falls
Crary, L. S. Fairfield
Crecelious, H. A. Plains
Crouse, S. A. Roundup
Crowley, L. G. Warm Springs
Culbertson, H. H. Billings
Currie, R. W. Billings
Dale, E. E. Cut Bank
Damm, W. P. Terry
Danskin, M. G. Glendive
Darland, F. L. Froid
Davis, R. C. Great Falls
Deal, A. W. Lewistown
Delaney, J. R. Kalispell
DeMers, J. J. Huntley
Denman, H. Baker
Dodge, A. A. Kalispell
Doles, E. A. Havre
Donich, G. M. Butte
Doyle, W. L. Superior
DuBois, W. L. Conrad
Dunkle, F. Billings
Dunlap, L. G. Anaconda
Durnin, R. B. Great Falls
Dyer, R. H. Sheridan
Eneboe, P. L. Bozeman
Farnsworth, F. B. Virginia City
Farr, E. M. Billings
Farrand, B. C. Jordan
Ferree, V. D. Bridger
Flinn, J. M. Helena
Floyd, J. S. Butte
Flynn, J. J. Missoula
Forester, W. L. Havre
Foss, A. R. Missoula
Fouts, E. R. Ryegate
Fredrickson, C. H. Missoula
Freed, H. Stanford
French, E. J. Ronan
Frisbee, J. B. Butte
Gallivan, E. L. Helena
Garvey, J. E. Butte
Gans, E. M. Harlowton
Gans, E. W. Harlowton
Gans, P. J. Lewistown
Garberson, J. H. Miles City
George, E. K. Missoula
Getty, R. W. Galen
Gibson, H. V. Great Falls
Giles, F. J. Missoula
Gillespie, D. L. Butte
Gleason, A. L. Great Falls
Gordon, D. A. Hamilton
Gordon, W. Billings
Graff, S. F. Butte
Graham, J. H. Billings
Graybeal, J. M. Missoula
Greaves, J. P. Great Falls
Greene, P. L. Livingston
Gregg, H. W. Butte
Griffin, P. E. Billings
Griffis, L. G. Kalispell
Grigg, E. R. Bozeman
Haas, A. T. Missoula
Hagmann, E. A. Billings
Hale, D. E. Butte
Hall, E. C. Laurel
Hall, H. J. Missoula
Hall, L. F. Helena
Halleck, P. P. Broadus
Hamernick, F. Crow Agency
Hamilton, W. F. Havre
Hammerel, A. L. Billings
Hanbidge, T. H. Missoula
Hanley, R. J. Billings
Harper, R. D. Sidney
Harris, W. E. Livingston
Haverfield, L. E. Hardin
Hawkins, T. L. Helena
Hayward, H. C. Hamilton
Heetderks, B. J. Bozeman
Herring, J. H. Lewistown
Hershey, E. Helena
Hesdorffer, M. B. Missoula
Hill, R. J. Whitefish
Hitchcock, E. D. Great Falls
Hodges, D. E. Billings
Holcomb, M. D. Whitefish
Holmes, G. V. Warm Springs
Holmes, J. T. Missoula
Holzberger, R. J. Great Falls
Honeycutt, C. F. Missoula
Hoon, A. S. Chinook
Horst, C. H. Butte
Houtz, C. S. Havre
Howard, E. M. Miles City
Howard, L. L. Great Falls
Hoyt, M. D. Glasgow
Huene, H. J. Forsyth
Huggins, H. D. Kalispell
Hunt, J. H. Glendive
Hurd, F. D. Great Falls
Hynes, J. E. Billings
Irwin, J. H. Great Falls
James, H. H. Butte
Jennings, G. M. Missoula
Jestrab, G. A. Havre
Johnson, A. C. Great Falls
Johnson, R. G. Harlowton
Joesting, H. C. Butte
Jump, C. F. Helena
Kane, J. J. Butte
Kane, P. E. Butte
Kane, R. C. Butte
Kargacin, T. J. Anaconda
Karsted, A. J. Butte
Kaulbach, J. J. Fort Benton
Kearns, E. J. Bozeman
Keenan, F. E. Great Falls
Keeton, R. G. Helena
Kilbourne, B. K. Helena
King, W. M. Missoula
Kintner, A. R. Missoula
Kirkwood, R. C. Missoula
Klein, O. G. Helena
Knapp, R. D. Wolf Point
Knierim, F. M. Glasgow
Knight, A. C. Philipsburg
Koessler, H. H. Missoula
Kreft, A. J. Fort Peck
Kroeze, R. Butte
Krogstad, L. T. Wolf Point
Kronmiller, L. H. Billings
Labbitt, L. H. Hardin
Lacey, W. A. Havre
Lamb, J. A. Kalispell
Lapierre, J. G. Butte
Larson, E. B. Glasgow
Larson, E. M. Great Falls
Lawson, C. W. Glasgow
Leard, S. E. Livingston
Levitt, L. Worden
Leeper, D. D. Laurel
Lees, A. T. Kalispell
Lemon, R. G. Glendive
Lewis, G. A. Roundup
Lhotka, J. F. Butte
Lieurance, E. Warm Springs
Lindeberg, S. B. Miles City
Lindstrom, E. H. Helena
Lipow, E. G. Ronan
Little, C. F. Great Falls
Logan, P. E. Great Falls
Long, W. E. Anaconda
Lord, B. E. Great Falls
Lowe, F. H. Missoula
Lund, C. Fairview
Macaulay, A. M. Great Falls
MacDonald, D. J. Billings
MacGregor, J. C. Great Falls
MacKenzie, D. S., Jr. Havre
MacKenzie, D. S., Sr. Havre
MacPherson, G. T. Butte
Maillet, L. L. Three Forks
Malee, F. H. Butte
Malee, J. J. Anaconda
Malloy, F. J. Anaconda
Marshall, J. F. S. Missoula
Marshall, W. J. Missoula
Martin, L. P. Missoula
Mathews, T. A. Missoula
Mayland, L. L. Great Falls
McBurney, L. R. Great Falls
McCabe, J. J. Helena
McGill, C. Butte
McGregor, H. J. Great Falls
McGregor, R. J. Great Falls
McIntyre, H. E. Billings
McMahon, E. S. Butte
McPhail, F. L. Great Falls
McPhail, W. N. Missoula
Meadows, W. A. Sunburst
Mills, F. A. Billings
Mittleman, E. J. Wolf Point
Monahan, R. C. Butte
Mondloch, J. L. Butte
Monserrate, D. N. Helena
Moore, T. B., Jr. Kalispell
Moore, T. B., Sr. Somers
Morledge, R. V. Billings
Morrill, R. A. Sidney
Morris, R. W. Helena
Morrison, J. D. Billings
Morrison, W. R. Billings

Munch, C. J.	Culbertson
Munro, A. T.	Kalispell
Murphy, E. S.	Missoula
Nagel, C. E.	Great Falls
Nelson, C. H.	Billings
Nelson, J. M.	Stevensville
Neraal, P. O.	Cut Bank
Neville, J. V.	Forsyth
Movius, A. J.	Billings
Noble, P. C.	Polson
Noonan, E. F.	Wibaux
Ohlmacher, J. P.	Missoula
O'Keefe, N. J.	Butte
Olsen, N. A.	Cut Bank
Olson, S. A.	Glendive
O'Neill, R. T.	Roundup
O'Rourke, L. J.	Anaconda
Packard, L. R.	Whitehall
Pampel, B. L.	Warm Springs
Paterson, W. F.	Conrad
Pease, F. D.	Missoula
Pearson, J. A.	Livingston
Pemberton, C. W.	Butte
Person, E. C.	Roundup
Peterson, C. H.	Great Falls
Peterson, R.	Glasgow
Peterson, R. F.	Butte
Phillips, J. H.	Bozeman
Piedalue, J.	Lewistown
Place, B. A.	Warm Springs
Porter, E. M.	Great Falls
Porter, E. S.	Lewistown
Powell, C. D.	Valier
Power, H. W.	Conrad
Powers, J. C.	Billings
Pratt, S. C.	Miles City
Randall, J. G.	Missoula
Randall, R. R.	Miles City
Rathman, O. C.	Billings
Rennick, P. S.	Stevensville
Rew, A. W.	Thompson Falls
Rich, E. L.	Billings
Richards, J. L.	Polson
Richards, W. G.	Billings
Richardson, R. B.	Great Falls
Ritchey, J. P.	Missoula
Robinson, W. C.	Shelby
Rodes, C. B.	Butte
Ross, F. B.	Kalispell
Routledge, G. L.	Dillon
Rowen, E. H.	Miles City
Russell, G. M.	Billings
Russell, R. G.	Billings
Russell, R.	Simms
Saam, S. F.	Butte
Saam, T. W.	Butte
Sabo, F. I.	Bozeman
Sale, G. G.	Missoula
Sandy, B. B.	Ekalaka
Schemm, F. R.	Great Falls
Scherer, R. G.	Bozeman
Schrader, H. F.	Browning
Schubert, J. W.	Hardin
Schwartz, H.	Butte
Schwartz, S. E.	Butte
Seerley, C. C.	Bozeman
Seigler, R. R.	Bozeman
Seitz, R. E.	Bozeman
Seivers, A. R.	Butte
Seivers, R. E.	Butte
Setzer, G. W.	Malta
Shanley, T. J. B.	Butte
Shearer, B. C.	Helena
Shephard, H. C.	Missoula
Shields, J. C.	Butte
Shillington, M. A.	Glendive
Silvernale, F. P.	Great Falls
Simons, H.	Butte
Simons, J. B.	Kalispell
Smetters, M.	Butte
Smith, A. N.	Glasgow
Smith, C. S.	Bozeman
Smith, L. W.	Butte
Smith, W. P.	Columbus
Snodgrass, M. R.	Anaconda
Souders, S. M.	Red Lodge
Soltero, J. R.	Lewistown
Spatz, J. M.	Glasgow
Spurck, P. T.	Butte
Stanchfield, H.	Manhattan
Steinberg, S. S.	Butte
Stephan, W. H.	Dillon
Stevens, L. S.	Billings
Storkan, J. C.	Plentywood
Strain, E.	Great Falls
Stripp, A. E.	Billings
Stubblebine, J. G.	Big Timber
Sussex, L. T.	Havre
Tarbox, B. R.	Forsyth
Taylor, W. W.	Whitefish
Teel, H. M.	Polson
Tefft, C. C.	Hamilton
Templeton, C. V.	Great Falls
Terrill, F. I.	Galen
Thompson, J. G.	Helena
Thompson, J. R.	Miles City
Thorkelson, J.	Butte
Thornton, C. R.	Missoula
Thornton, W. T.	Missoula
Towne, R. L.	Kalispell
Townsend, G. A.	Livingston
Trenouth, S. M.	Missoula
Turman, C. F.	Missoula
Tyler, K. A.	Boulder
Ungherini, V. O.	Butte
Unmack, F. C.	Deer Lodge
Vanderboget, C. L.	Missoula
Varco, A. R.	Miles City
Vasko, J. R.	Great Falls
Veldhuis, J. G.	Warm Springs
Vornholt, M. T.	Roundup
Vye, T. R.	Laurel
Walker, D. V. H.	Great Falls
Walker, R. E.	Livingston
Walker, T. F.	Great Falls
Wallin, C. C.	Lewistown
Waniata, F. K.	Great Falls
Weedman, W. F.	Billings
Weisgerber, A. L.	Great Falls
Welden, E. A.	Lewistown
Werner, S. L.	Billings
Wernham, J. I.	Billings
Whitehead, C. E.	Bozeman
Wilder, C. W.	Lewistown
Wilking, S. V.	Butte
Willess, H. F.	Lewistown
Williams, F. J.	Butte
Williams, R. A.	Bozeman
Williams, W. T.	Malta
Willits, A. J.	Anaconda
Windsor, G. A.	Livingston
Winter, M. D.	Miles City
Worstell, G.	Big Sandy
Wright, G. B.	Kalispell

The lowest infant death rate in the nation's history was recorded in 1939, according to preliminary tabulations made public recently by the Census Bureau, Department of Commerce. The 1939 infant death rate of 48.0 deaths per one thousand live births is based on 108,532 deaths of infants under one year of age. In 1938 there were 116,702 deaths which resulted in a rate of 51.0. The 1937 rate was 54.4 based on a total of 119,931 deaths. The record-breaking mark of 1939 represents the culmination of two decades of general decrease in infant mortality. Decreases in the infant mortality rate in 1939, compared with the previous year, were reported by forty-two states and the District of Columbia. The rate rose during the same period in six states. Minnesota's rate of 35.4 was the lowest last year. New Mexico, with a rate of 109.3 and Arizona, 95.5, reported the highest rates last year.

The Problem of Diabetes*

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THE pursuit of medical knowledge is a tantalizing occupation. At one time we seem to be on the verge of complete understanding, and then further investigation and the discovery of some other facts put us back into a state of uncertainty and confusion. Indeed, the more we know the less we know, and only the tyro or the egotist can hug to himself the delusion of certainty.

This has been particularly so with diabetes. Previous observers had connected diabetes with pathological changes in the pancreas, but Von Mering and Minkowski in 1889 proved the relationship by showing that the removal of the organ produced the disease. It appeared obvious then that the criminal had been discovered, and, when it was further shown that if all the gland were destroyed except the islands of Langerhans diabetes did not occur, it seemed that the criminal had been tracked to his lair. Later, with the successful extraction of insulin and its extraordinary efficiency, the problem of diabetes seemed to be so effectively solved that Joslin[1] could say: "Diabetes is a disease in which the secretion of the islands of Langerhans is deficient, and, as a result, the normal utilization of carbohydrate is impaired and glucose is excreted in the urine."

Treatment accordingly seemed simple. All one had to do was to make out a diet which would supply the patient's nutritional needs, and give an amount of insulin sufficient to make up for the deficiency of the pancreatic secretion, keeping the blood sugar within normal limits and the urine free from sugar, and the trick was done. With this in view lists were prepared giving the percentages of carbohydrates, proteins, and fats in every conceivable or even inconceivable article of food, so that what fallaciously appeared to be an accurately computed diet could be given the patient, and where the physician was either unable or too lazy to do this himself the drug manufacturers came to his rescue with elaborate tables which they presented him gratis. Later, with the advent of the dietitian, he was relieved of even this responsibility, so that he could now send a patient to a hospital, where the technician would make his chemical analyses, and the dietitian make out a diet for him, and all he had to do was to take his fee—if he could get it.

But there had always been some doubting Thomases who could not accept unreservedly the pancreatic theory. Hare[2] in 1905 wrote: "While disease of the pancreas is responsible for the development of diabetes in some cases, it is also a fact that in many cases of very severe diabetes the most careful examination of the pancreas after death fails to discover any lesion that can be considered in any way responsible for the malady." Even in the post-insulin era there were similar dissenting voices, Tuttle[3] saying: "Pathological studies of the last few years have all shown that degeneration of the islands of Langerhans can no longer be considered the common cause of diabetes. The degeneration does not correspond to the severity of the disease. In children and acute cases the pancreas remains practically normal. In cases of long duration the degeneration is slight, and no more than can be found in any other long exhausting disease affecting the nutrition of the cells. So that the pancreas may be sufficiently normal and yet a severe diabetes exist." Warren[4] approached the subject from the opposite angle. He examined the pancreas in 150 nondiabetics, and concluded that practically any lesion found in the pancreas of diabetics could be duplicated in those of nondiabetics, though he admitted they occurred more frequently in diabetics.

Because of this lack of relationship between clinical diabetes and pancreatic pathology the subject had to be reconsidered, and, as the result of an enormous amount of work, many facts have emerged which have changed our views, showing that diabetes is a far from simple matter, that many factors besides the pancreas have their share in it, and, as a consequence, instead of understanding it clearly one now rather gropes his way in an intellectual fog. One finds, too, that he has lost much of the confidence with which he hailed the advent of insulin as the long sought for key with which to unlock the doors leading to an understanding and an intelligent and effectual treatment of the disease.

Of course one cannot deny the intimate connection of the pancreas, for its removal at once causes diabetes. Without it sugar is largely excreted, and very soon the pancreatectomized animal dies. It is also true that life can be prolonged indefinitely with injected insulin. Consequently, when one meets with a patient who continuously passes sugar in his urine, and shows by his condition that his nutrition is suffering from that loss, and yet all this clears up with the injection of insulin, it is a perfectly just conclusion that his pancreas was not manufacturing enough insulin for his needs. But that is all. He may have a pancreas able to produce enough insulin for the needs of an ordinary person, but his particular needs may be inordinately increased, or there may be something which is neutralizing the insulin which his pancreas produces.

On the other hand, too much injected insulin will reduce the blood sugar so that symptoms of hypoglycemia result. Therefore, when we meet with these in a patient who has not been taking insulin, we are rather inclined to conclude that his pancreas must be secreting an excess. But again other factors enter.

Among these other factors the liver deserves first consideration. Since the time of Claude Bernard,[5] who in 1857 isolated glycogen from the liver and showed its relationship to sugar, a fierce controversy has raged as

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to its influence in diabetes, some contending that the cause of this was an overproduction of sugar by the liver, and others deficient utilization of sugar by the tissues. Like so many other controversies of the "either-or" type, both the disputants were probably in some measure right.

Clearly the liver is responsible for maintaining the level of the blood sugar, for following its removal there is a rapid fall, and the animal promptly dies. Mann[6] says: "Recovery from anesthesia and from the immediate effects of the operation is rapid. One hour after operation the animal appears almost normal, and remains so for from three to eight hours. During this period it walks around, responds to call, exhibits the usual interest in other dogs, and drinks water." Then develop in order "muscular weakness, loss of reflexes, flaccidity, return and exaggeration of reflexes, muscular twitchings, and convulsions. The average animal, if untreated, dies within two hours after the appearance of the first sign of muscular weakness." He showed how these symptoms corresponded with a decrease in the blood sugar and the muscles glycogen and that intravenous injections of glucose relieved them. Incidentally it was his work which furnished an understanding of the effects of excessive doses of insulin.

Under normal conditions most of the carbohydrate of a meal goes at once to the tissues, principally the muscles, where it is either utilized directly or stored as glycogen. Some of it is stored as glycogen by the liver, but much of the dextrose coming from the liver is manufactured by it from protein and fat, by which means a constant supply is furnished the blood, to be transported to the tissues to supply their continuous needs, for it is the vital food, the "fuel of life," as Macleod calls it. According to Young,[5] "the liver of the fasting 10 kilogram dog is secreting about 60 grams of sugar per 24 hours, which corresponds to about 400 grams of sugar for a fasting man."

When dextrose is supplied by a carbohydrate meal the liver normally decreases its output of sugar to prevent a hyperglycemia,[7] but in the diabetic fails to do so. In fact, it is already secreting too much, and a hyperglycemia exists. Consequently the ingested sugar is excreted as unnecessary.

The underutilization theory, or the belief that diabetic tissues, or, more correctly, tissues of the diabetic, cannot utilize dextrose was largely based on the failure of the respiratory quotient to rise on administration of dextrose to diabetic dogs. Macleod,[8] however, suggests this failure is due to "a loss of power by the liver to convert protein and fat into carbohydrate, a process which, by absorbing oxygen, would keep the quotient at a low level." And he also shows that, under certain conditions the respiratory quotient *does*, in fact, rise with the administration of dextrose. Best[9] does not place much reliance on the respiratory quotient. He says: "The determination of the respiratory quotient yields me very little satisfaction, since its interpretation is always in doubt." And Yater[10] puts it even more strongly: "What is called the respiratory quotient is merely a hypothesis."

However, direct experimental evidence proves conclusively that diabetic tissues *do* consume dextrose. Mann[11] first removed the pancreas, producing the usual increase of blood sugar. Later he removed the liver also, and the blood sugar immediately decreased. The sugar was not lost through the kidneys, "because many of the animals were anuric after hepatectomy, and those that did secrete urine passed only a small amount of sugar after operation." Still more conclusively, Yater[10] three days after removing the pancreas removed all the abdominal viscera except the urinary bladder and the suprarenal glands. Fifteen minutes after the second operation the dog had completely recovered, and the blood sugar was 316 mgs. per cent. It then rapidly fell, in four hours reaching 46 mgs. per cent, the animal being barely conscious. Here there was no possibility of excretion of sugar by the urine, for the kidneys had been removed, and it could not have been lost by the bowels, for they also were gone. It could only have been used up by the tissues. As further proof injection of glucose revived the animal, and Yater estimated that a liver-less dog requires 250 mgs. of sugar per hour to keep the blood sugar normal, in other words, the tissues use up that amount. However, he concludes that though muscle, which is the greatest consumer of dextrose, can do this about equally in the diabetic and the nondiabetic while in a state of rest, in diabetics it cannot meet the extra demands made upon it by work, which would explain the known muscular weakness of the diabetic. Thus the non-utilization theory at least seems partially true, and the honors can be divided between the protagonists of both doctrines.

Increasing the time between the removal of the pancreas and the liver produced interesting results. Twenty-four to forty-eight hours after pancreatectomy the blood sugar level is usually from two to four times greater than normal. If the liver is now removed symptoms of hypoglycemia appear, even though the blood sugar is above normal. Removal of the liver at from forty-eight to ninety-six hours after pancreatectomy causes the symptoms to appear earlier, and at a still higher blood sugar level. If the liver is removed later than that coma immediately develops.[11] It would appear that with the removal of the pancreas the tissues require a progressively increased blood sugar level—a higher tension, as it were—to enable them to effect the metabolism of glucose. This is borne out clinically, for we know that hypoglycemic symptoms may appear in a diabetic under treatment with insulin, especially in the elderly, with the blood sugar still above the normal level, and suggests that in some cases it is better to leave the level higher than normal. Himsworth,[12] in fact, considers the increased blood sugar of diabetics a compensatory process to enable the tissues to utilize sugar.

In the metabolism of carbohydrates, therefore, the liver and the pancreas are intimately associated. The pancreas, by its insulin, regulates the storage of carbohydrates and their production by the liver. Without it their storage is not effected and the manufacture of glucose is unrestrained, with consequent hyperglycemia and glycosuria. Without the liver there can, of course, be neither storage nor manufacture of glucose, and as soon as the reserves in the tissues are used up hypo-

glycemia occurs, resulting in death if carbohydrates are not speedily supplied. Thus we may have a hypoglycemia not only by an excess of insulin, but from a failure of the liver to produce sugar, and a hyperglycemia not only from a deficiency of insulin but from an excessive activity of the liver. It is after all a matter of relativity.

But there are other factors in the causation of diabetes, for though the removal of the pancreas usually produces hyperglycemia and glycosuria, this may be prevented. Houssay has demonstrated, and his findings have been amply confirmed, that if the pituitary be removed as well as the pancreas little or no hyperglycemia or glycosuria results and the animals can utilize considerable amounts of glucose, while small amounts of insulin produce fatal hypoglycemia. Also, injections of suitable anterior pituitary extracts restore the glycosuria. This antagonistic effect of pituitary extract to insulin was noted by Burn[13] in 1923. There is evidently a hormone produced by the pituitary which exercises control over carbohydrate metabolism. It stimulates the production of sugar by the liver, which in its absence ceases to produce sugar, and the animal to a certain extent resembles that partially hepatectomized. In the absence of the pituitary, but with the pancreas intact, the insulin which the pancreas produces causes an increased storage of carbohydrate or a decreased manufacture of glucose, and there is no hyperglycemia or glycosuria. Hence the so-called increased sugar tolerance of hypopituitarism. But with the pancreas gone as well as the pituitary, though its restraining influence on the liver is absent, sugar is still not poured out, for lack of the stimulus to its production ordinarily furnished by the pituitary. The factory is there, but it has closed down and the key is gone. In other words there is an antagonistic action of pituitary hormone and pancreatic insulin. Pituitary hormone increases the production of sugar and insulin restrains it. Under normal conditions a nice balance between the two exists, but if the pituitary influence is in excess we have an increased outpouring of sugar, and a diabetes, and if the pancreatic influence is increased a lessened manufacture or a greater storage, and a hypoglycemia, as in so-called hyperinsulism. But there may be a normal pancreas in the one case or a normal pituitary in the other. Again it is a question of relativity. The pituitary hormone, the so-called diabetogenic hormone, is probably produced by the eosinophilic cells, and is associated with, though not identical with, the growth hormone. You will remember, too, that glycosuria occurs with acromegaly.

A glycosuria or a diabetes may be also produced by the suprarenals. Epinephrin, the hormone of the medullary portion, from its antagonistic effect to insulin in mobilizing glucose, has long been used for counteracting an excess of injected insulin. When the adrenals are removed the diabetes produced by pancreatectomy is much alleviated, the animals even becoming hypoglycemic if sufficient glucose is not supplied.[14] This is not due to the loss of epinephrin, for removal of the medullary tissue alone does not have the effect. The cortical portion seems to be the part concerned, and though until recently administration of cortical extract had not been able to restore the diabetes, Lukens and Dohen[15] claim they have now done so by large doses.

Also we have to consider the possible effect of a duodenal hormone influencing carbohydrate metabolism.[16] As a method of treating diabetes orally this may present hopeful possibilities.

Diabetes, too, is more than a disorder of carbohydrate metabolism. It is also a disorder of fat metabolism, if not of other things. The complexity of the subject has been indicated in the treatment of schizophrenia by insulin shock, where changes not only in the sugar but also in the amino-acids, potassium, inorganic phosphorus, cholesterol, and serum proteins of the blood have been noted.[17] Particularly since the days of insulin we have concentrated our attention upon the most obvious factor, the sugar in the urine or blood, and neglected the others. The relationship between diabetes and fat has long been recognized. Joslin[18] said: "With an excess of fat diabetes begins, and from an excess of fat diabetics die." In the untreated diabetic the fats in the blood increase with the sugar, and the higher the fat the worse the prognosis. It is unfortunate that we do not have a simple method of estimating the blood fat, as we have for the sugar, for then we would pay more attention to it. It is the imperfect combustion of fats that causes the ketosis and the coma from which patients die. Fatty degeneration and infiltration of the liver are common in diabetes, and are the cause of the enlargement often seen.

Fat is normally stored in the body as a reserve supply of energy, which can be drawn upon in times of need. In arranging these storehouses nature has very ingeniously made them also serve as a padding for the other tissues and for esthetic effects. We appreciate the beauty of well rounded curves, especially in the female, though unfortunately over-indulgence in food converts them into the unsightly bumps we so often have to contemplate, and makes one hope that nudism will never become the vogue. In their dual purpose these deposits of fat resemble those of calcium, which as bone serve for structural support while furnishing supplies of calcium as needed.

A continuous supply of dextrose is essential to life. The carbohydrate of the food furnishes some of it, but it is also manufactured by the liver from both protein and fat, though apparently with more difficulty. In diabetes it produces an excessive amount of sugar, but in the case of the fats, and to a less extent the proteins, because of the greater difficulty of converting them to glucose part is insufficiently oxidized and stops at the stage of ketone formation. It is said that fats burn in the fire of the carbohydrates, but what really happens is that ordinarily, with a sufficiency of carbohydrate, there is little need for the liver to utilize the fats, and what little it does convert into dextrose it is well able to take care of. However, when carbohydrates are withheld it has to draw upon the stored fats and consequently ketone formation occurs. Insulin, by checking the overproduction of sugar, spares the fats and hence limits the production of ketones.

But another factor enters. Pancreatectomized animals even when treated with insulin soon succumb with fatty degeneration of the liver[8] as did those without insulin, in much the same way as in poisoning by phosphorus or chloroform or in yellow fever or acute yellow atrophy of the liver. It was found that death of pancreatectomized animals could be prevented by the feeding of raw pancreas, and Best[19] showed it could also be prevented by choline, which he thought stimulated the liver cells to oxidize fatty acids. Jones et al[20] found that in about half of a group of cases of diabetes there was a diminished activity of the pancreatic enzymes and considered that besides a disorder of the insulin mechanism there was an associated abnormality of the external secretion. Dragstedt et al,[21] however, concluded that the trouble was not due to a deficiency of something in the pancreatic juice, for the administration of fresh pancreatic juice did not prevent the development of the symptoms, but to another substance which they obtained in alcoholic extracts of beef pancreas, and believed it to be a new hormone which is concerned in some way with the normal transport and utilization of fat. They call this lipocaic. Bloor[22] suggested this possibility in 1917 and it may lead to a better control of acidosis and fat metabolism.

It would explain, too, the difference in the fate of fat and lean animals after pancreatectomy. Fat animals die in a few days with marked hyperglycemia and ketonemia, while lean ones after an initial ketonemia recover from it and live for over a month. The blood of the fat ones, in the absence of the fat hormone, is flooded with fat which the liver is unable to oxidize properly, and ketonemia results, while, on the other hand, as the lean ones have little fat, the liver is able to take care of it. Rosenberg[23] has reported the successful treatment of enlarged fatty liver in diabetes by this extract.

But again newer knowledge causes confusion and doubt. It has been stated that it is a failure of the intermediate metabolism of the carbohydrates themselves which causes ketosis,[24] and that this can be relieved by the administration of succinic or citric acid. Unfortunately, this has not been confirmed by later observers.[25] I tried it myself, too, without success. Also have the proteins been incriminated in the production of diabetic acidosis, certain amino acids, as leucin, not being capable of conversion into carbohydrates, but forming acetone bodies.[26] Thus the further we go the deeper we get into the morass.

The need of keeping diabetics free from glycosuria and with a normal blood sugar has frequently been stressed, but is this so necessary? It is doubtful whether the complications of diabetes are really caused by the excess of sugar. Wounds in untreated diabetics may heal with difficulty, and they may be poor surgical risks, but is this due simply to the excess of sugar in the blood? That insulin helps the condition does not prove that it is the sugar which is the trouble. Macleod[8] kept depancreatized dogs alive for four years with insulin, giving them enough sugar to produce a persistent glycosuria, to prevent hypoglycemia during the night, but during that time he says, "none of the symptoms of cataract, of gangrene, of arteriosclerosis, or of nephritis, which some have supposed may supervene after the blood sugar has been supernormal for some time was manifested," and he estimates that the four years of the dogs' lives corresponded to twenty years of man's. On the other hand, it is related how one experimental dog, with part of the liver and all the pancreas removed, had "suppuration of the abdominal wound and the characteristic scum of the conjunctiva," though it had neither hyperglycemia nor glycosuria.[10]

The disordered fat metabolism, particularly the excess of cholesterol, is probably responsible for the vascular disease so common in diabetes, rather than the sugar. Root and Sharkey[27] say: "Sugar is soluble and combustible, whereas cholesterol is not combustible, is difficult to excrete, and tends to be stored." "It is the one substance found in both the blood and the blood vessel walls with which experimentally typical atherosclerotic lesions can be produced." These authors found that the cholesterol content of the aortic walls of the diabetic was 8.07 grams per cent as against 4.8 grams per cent in nondiabetics. In diabetic blood vessels there is a marked localized proliferation of the intima with deposition of fatty material, including cholesterol crystals. Others, however, are not convinced.[28]

Nor are the eye changes associated with diabetes necessarily due to hyperglycemia. Cammidge[29] says: "The view at first adopted that the retinal changes were a direct result of the presence of an excess of sugar in the blood has been abandoned by most modern authorities, mainly on the ground that the incidence of the complication and the severity of the primary disease did not show the relation which might be expected if this explanation were correct." He was inclined to attribute them to a deficiency of calcium, but Waite and Benham[30] doubt this, though they agree that there is an absence of correlation between the incidence of cataract and the amount of glucose in the blood or ocular fluids. These authors also contend that cataracts are not more frequent in diabetics than in nondiabetics. Parsons[31] thinks they may be related to a deficiency of vitamin C. Again we do not know.

Diabetic neuritis was thought to be caused by the excess of sugar, but it is very doubtful if this is so. Jordon[32] says: "It seems that some obscure feature of the diabetes and not simply hyperglycemia is at fault." Though it is possible that too many things are now being attributed to vitamins or the lack of them, a deficiency of vitamin B may be a likely cause, as it almost certainly is of the neuritis formerly supposed to be due to alcohol. It need not be because of a lack of the necessary vitamin in the food. There may be a lack of absorption from the alimentary tract. Or there may be an impaired utilization by the nervous tissues or a defective storage. Indeed, vitamin B_1 or thiamin may have more to do with diabetes than simply with neuritis. Wilder[33] remarks: "It has long been recognized that the activity of thiamin is closely related to that of the oxidation of carbohydrates."

But whether or not it is so desirable to keep diabetics free from glycosuria and hyperglycemia, as a matter of fact, in spite of all our efforts, the average patient does

not do so. While we have him in the hospital we go to a good deal of trouble to achieve this ideal, and try to impress upon him its necessity, but after he goes home, feeling well, he generally gets impatient with all the fuss and lapses into dietetic sins. He quits weighing or measuring his food, trusting to his memory of what the proper amounts look like, and only tests his urine on rare occasions. Usually he tries another doctor or two, and even, if his financial condition admits, journeys to distant places of repute, getting different food prescriptions at each, at one a low carbohydrate, high fat, at another, high carbohydrate, low fat, and at others various compromises between the two. Ultimately he settles down, largely to his own devices, varying his diet as he feels inclined, but mostly continuing his insulin in amounts determined by his feelings, and, in spite of it all, in the majority of cases he gets along very well, though most of the time he passes sugar. At times he gets into trouble and returns for advice or help, but, the emergency over, back he goes to his own methods. In fact, it has been a matter of surprise to me, impressed with the need of keeping him sugar free, how well he really does.

It is this which has made me doubt the necessity of keeping him sugar free, and others seem to be feeling the same way about it. No less an authority than Joslin[34] has said: "I wonder if a little hyperglycemia now and then may not be a good thing. Clemenceau with diabetes won the war. Would he have been as vigorous at 77 and as successful without it?" Of course a patient must have sufficient insulin to maintain an adequate carbohydrate metabolism, and ketosis must be controlled, but does the mere excretion of an excess of sugar do any harm? In fact, I wonder whether a glycosuria in the adipose is not an effort of nature to keep him from getting fatter.

On the other hand if we persist in trying to keep some diabetics sugar free we simply produce alternations of hyper- and hypoglycemia. From the nature of these cases I cannot see how we can expect to prevent this unless we let them run sugar. If we give plain insulin we may take care of the rise of blood sugar due to the exogenous carbohydrate of the food, but not of the endogenous sugar produced by the liver between meals. If we give the more prolonged acting insulins we may take care of the endogenous carbohydrate but not of the added exogenous of the meals. If we combine the two we still have to contend with the fluctuations of gluconeogenesis or tissue oxidation from exercise or emotional excitement. Again we have to remember that diabetes is not simply a disease of the pancreas but a disorder of more than one of the endocrine glands and probably also of some centers of the midbrain. All the information we have gained in the last few years only shows that it is precious little we really know about diabetes.

Hypoglycemia may do more harm than we realize. The brain is a very delicate mechanism, and is particularly susceptible to changes in blood glucose, being "the only organ to acquire its energy from the exclusive oxidation of carbohydrate . . . and has little store of carbohydrate."[35] Postmortem examinations of brains of persons dying of spontaneous or induced hypoglycemias have shown "edema and widespread degenerations of the nerve cells in the cerebral cortex and diencephalon." Cerebral hemorrhages and petechial hemorrhages have also been reported. Stanley Cobb[36] has summed up these dangers in discussing insulin shock therapy in schizophrenia. Even in the absence of structural changes the psychological effects of a constant dread of hypoglycemic symptoms are not to be ignored. I recall one case where neither I nor anyone else who had tried their hands upon him had been able to keep him sugar free, and who had become positively afraid to venture away from home for fear of hypoglycemia. By letting him run sugar he has been able to carry on normal activities, and even to indulge in such sports as tennis and dancing. In fact he recently volunteered the information that he now seems to have more endurance than his associates.

Of course it would be ideal to keep the blood sugar always normal and the urine free from sugar, but except in comparatively mild cases I cannot see how we can expect to achieve this ideal under ordinary conditions of life. The normal sugar mechanism is a very finely adjusted process. It must be so to keep the blood sugar within such narrow limits in the face of the large accretion received after a meal or the constant variations of the tissue requirements in the changing activities of every-day life. But in diabetes this finely adjusted mechanism is deranged, and we do not know how to cure this derangement. How then can we expect to secure the desired uniformity by merely depositing a fixed amount of insulin under the skin at certain definite times? If we keep the blood sugar normal for a low level of activity we are bound to have a deficiency in times of stress, and if we want to make provision for these times of stress we must have a hyperglycemia at rest. We have indeed to effect a compromise between two evils, and I believe the lesser of these is to allow a moderate hyperglycemia so that we may have a margin of safety for times of unexpected extra activity, for there are occasions, as in driving a motor car, when a patient's life may depend on available extra sugar.

As a matter of fact not only has our treatment never achieved the ideal, but, when one reviews it over a number of years, one cannot resist the humiliating conclusion that it has mostly been wrong. Osler[37] in 1901 enumerated among the reputed remedies opium, potassium bromide, arsenic, antipyrin, salicylates, iodoform, nitroglycerin, jambul, salts of lithium, strychnine, creosote, and lactic acid, a truly amazing list, though, as one would expect from Osler, with his usual common sense and therapeutic scepticism he added that the medicinal treatment was most unsatisfactory, no one drug appearing to have a curative influence. One reads the list, however, with a distinct lack of admiration for the critical faculty of the profession in the matter of drugs and remedies, for someone or other must have thought that each of these did good. Nor were our dietary prescriptions much better. We cut out the carbohydrates before we learned the absolute necessity of them, and we starved our patients before we grasped the fact that this was simply compelling them to live on the proteins and

fats of their tissues with a consequent danger of acidosis. And still there is no unanimity. As the patient wanders from physician to physician he gets a different food prescription from each, receiving at the same time the covert suggestion that the last consulted is the one and only possessor of the true doctrine of diabetic feeding. Often in the past we must have done our unfortunate patients more harm than good, and even hastened some to their graves. I wonder sometimes how wrong we still are.

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The Physician and the Public Health Program*

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THE relationship between the health program and the private practitioner inevitably provokes a great deal of animated controversy. So much has been said within medical circles in criticism of governmental participation in problems of health and disease that I should like to discuss what I believe should be the position of the health department which the people have established to protect them against the ravages of illness. Because of my present academic position I can speak quite freely without my remarks being interpreted as the official pronouncement of any board or bureau. They are an expression of personal views with which many engaged in private practice or in official public health work may disagree. If my remarks help merely to focus discussion on some of the most important issues, they will have served a more useful purpose than if they be accepted without debate. My remarks are directed solely to members of the medical profession—not to the general public.

The primary purpose of and the only excuse for an organized government is the protection of the welfare of its citizens. Whether the factors against which protection is needed be an invading enemy, internal rebellion, fire, famine or disease, government has in each instance a responsibility that it cannot avoid. This concept has been recognized for centuries and is inherent in our entire social structure. It has guided all of our community thinking whether in the field of education, commerce, safety or health. The importance of health as one of the community's most valuable assets is equally well recognized. In the middle of the last century Disraeli, that great leader of a capitalistic era, gave emphasis to this concept in the statement that "public health is the foundation upon which rests the happiness of the people and the power of the State. The first duty of a statesman is the care of the public health."

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In its earliest form this governmental duty found expression in the many prohibitions that were enacted. Some of these appear to us as rather fantastic attempts to prevent the plagues and pestilences that were the principal public health problems of those days. Yet these enactments placed on firm foundations the concept that the people as a whole have a right to adopt those measures which are necessary for their own protection, even though they be measures which interfere at times with the rights of the individual. This view of the police power of government is so broad as to embrace the principle that the individual may be required to perform certain acts or to submit to certain personal sacrifice if by so doing he will further the welfare of society.

About the middle of the last century there evolved a new orientation toward public responsibility for health that has guided much of our subsequent thinking. When Edwin Chadwick was made secretary of the board to administer the Poor Laws in England he was impressed with the fact that vast sums of public monies were being spent to care for those who were incapacitated or left destitute by the ravages of illnesses that might have been prevented. He naturally inquired if it might not be more logical to finance a program of prevention than to wait until illness had developed and then pour out greater sums for the care of conditions that might have been but were not avoided. If a family is left destitute because of the death of the wage earner, the community must support the dependents. Chadwick postulated, therefore, a responsibility of government for the health of its people, that if properly performed would reduce the outlay in grants for welfare aid. This was not the reasoning of a rattle-brained reformer bent on socialistic experiment and governmental usurpation of all personal rights and prerogatives. It did not come out of any communistic or totalitarian state. It evolved about a century ago in a country that was at the peak of its capitalistic development. It was a concept of pounds and shillings, not of intangible speculation as to human rights to a sound body and a sound mind. If this somewhat mercenary type of reasoning is tempered with humanitarian concepts we have a philosophy of public health that is of very broad public appeal to all classes of society. It is a concept of governmental right and duty to carry out those measures that will reduce both the incidence and unfortunate consequences of illness.

The early expressions of this philosophy were based on the prevailing ideas as to the cause of disease. During the middle of the 19th century medical men were still thinking in terms of miasms and vapors that arose from insanitary circumstances. Attention was therefore directed toward community sanitation to remove the filth that through its decay generated the supposedly noxious gases. The regulatory power of government, already established on firm foundations, was used widely for this purpose. With the advent of the era of bacteriology toward the end of the century, this regulatory program was directed more specifically toward the factors that favored the spread of communicable disease, the most serious causes of sickness at that time.

In order to carry out these tasks of protecting the health of the people a new governmental agency was created, the health department or board. To this agency was entrusted the responsibility of protecting the people against all sources of illness and causes of death. The acts creating these boards gave no suggestion that their activities were to be confined to the control of the communicable diseases. The law establishing the first state health department in the United States instructed that board to "take cognizance of the interests of health and life among the citizens." It was the intent of the legislature that this board should concern itself with any cause of sickness. Its early preoccupation with infectious diseases was a matter of expedience, not legal restriction.

In view of this mandate from the people it is very logical that a health department should now inquire to what extent it may direct its energies toward ameliorating any condition that is an important cause of illness or death. Cancer, heart disease, diabetes and accidents rank among our leading causes of death and arthritis one of our chief sources of physical incapacity. The community's responsibility for the care of these cases and their dependents is just as great as it is for the care of those ill or left destitute as a result of typhoid fever or bubonic plague. A crippled child may become a burden to society for a lifetime unless its disability is so corrected as to enable it to become economically self-supporting. A child with defective vision may, if untreated, become a life-long community charge.

Unfortunately, however, our present knowledge does not always permit us to remove those factors that favor the development of these conditions. We cannot by mere exercise of the regulatory power of government prevent the development of cancer or arthritis in the same manner as we prevent typhoid fever through improved water supplies or eliminate yellow fever through mosquito eradication. The etiologic forces are too imperfectly understood. Yet we do know that earlier diagnosis and improved care will often prevent death or reduce the debility of prolonged illness. Since the community has the ultimate responsibility for these persons it is only logical that it should inquire to what degree it may, through its health agencies, reduce the burden of illness, debility and destitution. We cannot expect society to say that it will do nothing to lessen this toll but will shoulder the economic load after medical science applied on a purely individual basis has exhausted its possibilities.

This concept of public responsibility for the care as well as the prevention of illness is, however, no new idea of a social order that many fear is drifting rapidly toward socialism. About a hundred and fifty years ago, the federal government of the United States gave recognition to it when a governmental bureau was established to provide medical care for the merchant marine. This concept has found expression in the creation of tax-supported hospitals, especially for the care of the tuberculous and those mentally ill. During the latter half of the last century it was expressed through the creation of tax-supported medical schools, to make certain of a supply of adequately trained physicians. While the physician graduating from such a school is the immediate

beneficiary of an education that cost far more than he paid, the public ultimately benefits through an improved quality of medical practice. This public concern for sickness found further expression in the licensing of those to whom the care of illness is entrusted. In the more conventional fields of public health enterprise we find equally great evidence of public concern for problems of illness. The first laboratories for the bacteriologic diagnosis of communicable disease were established by government. Official agencies early provided for the free distribution of certain biologic products for treatment and later for prevention.

All of these activities serve directly or indirectly to reduce the toll of illness. Yet they all have one thing in common, namely, they have to some measure interfered with private enterprise and initiative. Lavish use of the facilities of the tax-supported laboratories by the practicing physician has sharply limited the opportunities for laboratories conducted for personal profit, yet it has brought about more extensive use of procedures which are invaluable as adjuncts to diagnosis and treatment. The free or reduced rate distribution of biologic products has led to greater use of some of our most potent therapeutic and prophylactic agents and has made them available to many who might otherwise be denied their benefits because of financial circumstances. Yet governmental activity in the manufacture and distribution of these products has unquestionably reduced the potential profits of the biologic manufacturing houses and the retail druggists. Similarly the university supported by tax or endowment has virtually driven out the proprietary school and the public sanatoria and mental disease hospitals have sharply limited private enterprise in these fields. Public water supply systems supported by tax funds have largely replaced the earlier privately owned water companies and greatly interfered with the possible sales of spring water.

It cannot be denied that whenever government enters into the field of service to the public, it competes with private enterprise and may ultimately control the field to a large degree. Such undertakings have, of course, been branded as socialistic, which, so far as I can determine, is a term of disapprobation that one can apply to any governmental activity that one happens to dislike, even though it benefits the majority. Yet if these undertakings are socialistic, and I believe they are, we must reconstrue the term to include every form of governmental service that promotes the well-being of the people. Who would deny that public water supplies have reduced the incidence of typhoid fever and helped eliminate cholera, that the laboratory services and biologic products have helped control diphtheria and smallpox, that the sanatorium has contributed to the reduction of the spread of tuberculosis? Because all of these services have been rendered free or at reduced cost they have been more readily available and used more lavishly. Their conduct and operation by health departments represent merely the response of government to the mandate of the voters to "take cognizance of the interests of health and life among the citizens."

In view of the successes that have been achieved by government in reducing the toll of illness, it is logical to inquire to what extent the same principles may be applied to the solution of present health problems. While the possibilities of environmental sanitation have by no means been exhausted and great advances may be expected through its further application to the control of insect-borne and industrial diseases, the principal problems of the present time are those in which we must deal with the individual. Much of the problem is that of personal and community education. This is certainly within the province of government. Yet even if we had attained the goal of creating public appreciation and understanding of personal hygiene and the importance of adequate medical care, there would remain a great gap between our available scientific knowledge and its universal application. We would be confronted with the fact that illness is progressing that might have been arrested and that untimely deaths are occurring that might have been avoided had full utilization been made of the procedures of modern medical science. It is inevitable that a health department, conscious of its responsibilities to the public, should inquire if it cannot in some manner marshall the resources of the community to make these services more readily available to the entire public.

At the risk of apparent repetition it should be emphasized that the decision of a health department in such a situation must be based solely on its responsibility to the public whom it is employed to serve. Some persons have felt that the health department owes a primary responsibility to the medical profession and that it should obtain the consent of the latter before embarking upon any new enterprise. I would most heartily agree that the medical profession, whose primary concern is that of health and disease, should be consulted at all times and should be in a position to advise as to the technical details of any community program involving disease control. Yet I cannot concur in the belief that the profession is justified in opposing or blocking any program merely on the ground that the undertaking may interfere with the private practice of medicine. The rights that we enjoy as physicians are those that have been given to us by the people, but in granting these to us the people have not renounced their privilege of protecting themselves against disease in any way they may see fit. If the people decide that they wish to establish a public clinic to immunize against diphtheria, to treat syphilis, or to diagnose cancer, it is their inalienable right to do so. If they wish to establish a system of health insurance or even complete regimentation of medicine, they are still within their rights and are infringing no special privileges of the medical profession. This right of the people to provide for themselves in accordance with the wishes of the majority as expressed through the ballot is inherent in the democratic form of government. Any infringement of this right constitutes as dangerous an attack upon democracy as do the manifold "isms."

It has been argued that plans for greater participation of government in the medical care of the people are un-American, it being apparently supposed that Ameri-

canism is something static which broaches of nothing new. On the contrary we must acknowledge that nothing is quite so un-American as to suggest that the people can not set up any system of health protection that they see fit. Not even the threats that have been thoughtlessly made to refuse to participate in such projects can alter the people's rights. Any person who thinks clearly cannot fail to discern that the execution of such a threat would amount to a strike against the people. Neither the W.P.A. employees nor other groups have the right to block the expressed will of the people. Just as soon as they are permitted to do so the death knell of democracy will have been sounded.

It would be quite wrong to infer that I came here to suggest that boards of health should embark upon a program of general medical care. I do not favor such a program simply because I do not believe it is the best solution of our problems. I believe that it is essential, however, that if the medical profession is to oppose any form of extension of governmental participation in medical care, this opposition should be based upon the grounds of public weal, not any assumed rights of the profession. Unless we protect ourselves in this manner we are placing our profession in the same role as the labor union or commercial interest that seeks special legislation because of the personal advantage to be derived, regardless of the effects on the general public. In one of the eastern states a few years ago the medical profession bitterly fought a bill for a state cancer program, the opposition being based on a supposed interference with the private practice of medicine. In recognition of this opposition the legislature in passing the bill by an overwhelming majority instructed the state health department to establish cancer clinics "with or without coöperation on the part of local physicians." Had there been more constructive guidance from the profession rather than mere opposition a far better and more workable bill might have been evolved. Yet as one of the legislative leaders remarked at that time to the state health commissioner, "The people have piped; it is now up to you to dance." If the general welfare of the people can only be made the basis of constructive suggestions, we will find little difficulty in guiding legislative bodies into sound policies.

Acceptance of the premise that the people have the right to provide for public medical care does not however mean that we accept the doctrine that all forms of such care will be for the public benefit. We may very logically anticipate that the quality of medical service rendered under a certain proposal would be so inferior to that at present available that the public would suffer. Under such a circumstance we not only may, but have a very real duty, to register our opposition, emphasizing, however, the basis for this opposition. With this in mind let us examine briefly some of the types of services that may be offered. For the purpose of discussion they may be divided into the direct and the indirect.

The direct services are those in which the board of health deals with the patient without the intermediary of the family physician. This is exemplified by the public clinic or by some of the extreme proposals for regimentation of medical care which would deprive the patient of free choice of physician. Whether or not a service can be offered effectively through a clinic must depend very largely on the degree to which it must be individualized. I do not believe that government can efficiently operate a system of complete medical service supported out of tax funds because under such a plan it would be impossible to make the individual modifications and adjustments that are necessary for the highest quality of medical care. Such a system would strike at the very heart of the fundamental patient-physician relationship as it would deprive the patient of his free choice of a medical adviser in whom he had confidence. It would, I believe, tend to a deterioration of the quality of medical practice and is therefore a plan that may be soundly opposed.

This does not mean, however, that health insurance should be discarded without a reasonable trial, so long as it preserves the patient-physician relationship. I do not know whether health insurance is sound or unsound. I find myself confused when those who control the official organs of American medicine report on the editorial page that the English profession is extremely dissatisfied with the panel system yet I read in the London newsletter of the same issue that the British Medical Society has petitioned the government to extend the system to include persons not now eligible for such service. Hospital insurance was bitterly criticized at its inception yet has been a tremendous success. I sincerely hope that we may see a reasonable trial of many different types of health insurance plans so that we may determine to what extent they are practicable and what effects they have upon the quality of medical practice. Unless we experiment we shall never know. Yet in making such an experiment we must be cautious not to form conclusions too hastily. We must remember that no experiment is perfect at its inception. That crude collection of parts known as an automobile at the beginning of the present century was full of flaws and defects yet from it has evolved the highly perfected mechanism of 1940.

There are types of direct service, however, in which there is less need for individualization. A child may be immunized against diphtheria just as effectively in a public clinic as in the physician's private office. The protection is equally great in either case. The procedure has been so standardized that it may be effectively performed on a mass basis. We cannot logically object, therefore, if the people desire to obtain protection in this way at public expense, even though children may appear at the clinic who can afford private service. We accept the same principle without question in education. The health department has no special desire to maintain a clinic; in fact the more children immunized in private practice the fewer there will be to attend a clinic. All of the educational work of the health department is directed toward persuading the patient to obtain this protection from the usual medical attendant. Yet the department supported by tax funds and established for the purpose of protecting the public cannot logically refuse to protect those who are not immunized in private practice.

In some places a plan, which I believe to be falsely labelled as "medical participation," has been demanded by the medical profession in lieu of clinics. Under this plan all patients are referred to the office of the family physician who in turn charges the city at a rate somewhat less than that usually charged. This practice would be ideal if the total cost to the taxpayers were the same as that of performing the same number of immunizations on a clinic basis. Unfortunately it usually runs much higher. We are thus asking the public to pay at a higher rate than would be charged for the same service on a clinic basis. The situation is comparable to the demand of a spring water company that the city purchase its water to distribute through the pipes at a price several times that required to install and maintain a municipally owned treatment works. I fully realize that the originators of this plan in Detroit defended the higher costs on the supposition that by inducing the patient to obtain this service in the physician's office, he would at the same time be educated to seek additional preventive services that would be paid for by the individual. Yet under this plan smallpox immunizations declined and within barely five years the city officials virtually acknowledged the error of their earlier supposition when they announced that henceforth they would pay physicians on a similar basis for tuberculin tests and chest X-rays performed in their private offices. Although such a procedure has been described as an antidote to socialization of medicine, I can find in it little more than a plan of educating the public to go to the physician's office and saying "Charge it to the city," which is state medicine in an extreme form. I firmly believe that it is far preferable for the health department to render those direct services which it can efficiently, with the full realization that under no circumstances can it ever offer the refinements of personal attention that are possible only in private practice.

The indirect services that a health department may properly perform to relieve the toll of illness are those which, though at times entailing contact with the patient, are carried out only at the request of the attending physician, who seeks governmental aid in the proper care of his patients. The principal reason for the demand for greater governmental participation in medical service comes from the fact that scientific progress has far outrun our plans for bringing the benefits of these discoveries to the patient. The practice of modern scientific medicine is expensive, involving the use of tests and procedures that are often beyond the financial capacity of the patient. Under such circumstances the physician is too often forced to rely on clinical judgment unsupported by the more exact methods which he knows are available. During his medical school and hospital training the physician is taught to utilize procedures which are later denied to him for financial reasons. How many throat cultures for diphtheria or serologic tests for syphilis would be performed if the physician was required to pay three or four dollars for them with the hope that he might be able to collect this from the patient in addition to his fee for services? How much diphtheria antitoxin or pneumonia serum would be used if the physician had to purchase it at retail rates again hoping he might have the cost refunded to him by the patient? These facilities are provided by government not directly to the patient but through the medium of the family physician. The public benefits because they enable the physician to practice a better type of medicine. Yet in other conditions economic forces all too often compel him to practice a type of medicine somewhat short of the best for which he has been trained.

There seems to me to be at the present time a very real need for governmental assistance in making these specialized diagnostic and therapeutic procedures more readily available. The types of service now available refer especially to the communicable diseases, yet we have already seen attempts made to provide similar assistance in the care of other conditions. Some health departments perform chemical tests, examine suspected tumor specimens, loan radium to hospitals and provide X-rays for diagnosis of tuberculosis or cancer. In one state a group of prominent cardiologists petitioned the legislature for free electrocardiograms and the distribution of digitalis. Several states have embarked upon programs for state aid in the diagnosis of cancer. Provision has been made for special clinics, to which the physicians may refer or bring their patients for expert advice, the findings being reported to the referring physician. One state has, upon recommendation of the health department and the medical profession, provided for state support of certain hospital beds for the study of arthritis. It is proposed under such a plan that a patient may be referred by the family physician and that when the case has been thoroughly studied by modern methods the patient will be returned to the referring physician with a full statement of findings and recommendations for treatment.

Although these procedures are varied in their nature they have one thing in common, namely, they all aim to supplement rather than to supplant existing medical practice. It is not intended that the laboratory test should be performed on direct request of the patient but only upon the request of a licensed practitioner, to whom the findings are reported. If the diagnostic or therapeutic procedure involves direct examination of the patient, this is performed only upon those patients who are so referred by the attending physician. In this manner government attempts to place at the disposal of the family physician facilities that under any other system are denied to him.

How far it is feasible to extend such a plan of supplementing the practice of medicine through the provisions of special facilities remains to be seen. I feel confident that we have barely scratched the surface of the possibilities of such a program, yet whenever it has been tried there has been direct benefit to the public and incidentally to the physician who thus finds at his command facilities that were formerly denied to him. If such measures can be soundly carried out in the field of communicable disease, they are equally practical in the maze of expensive procedures attendant upon the care of other diseases. Governmental provision of such aids to practice would be a most valuable step in bridging the gap

between our present knowledge and its general application. It would go a long way toward reducing the present problem of the high cost of medical service. It would improve the quality of medical practice and would serve to reduce the demand for schemes that I, in company with others, fear may result in a poorer type of medical service to the public.

It seems certain that the health program of the future will involve attention to many conditions which, though important causes of death, have been largely neglected in the past. Our only possible approach to these at the present time must entail some measure of personal service. The direct services can usually be rendered more effectively through private practice, but in those rather limited fields where group service is possible we should not seek to deny to the public the right to obtain these in that way if it is more economical yet equally effective. The indirect services that government may offer through the medium of the attending physician comprise one of the most fertile and promising channels through which the community may approach these problems. If we could only so shape the course of governmental activity as to envision greater supplementation of medical practice, we would see less public demand for schemes which would tend to supplant private practice.

Decompression of the Obstructed Intestine by Manipulation Under Ether and Pentobarbital Sodium Anesthesia

An Experimental Study

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DECOMPRESSION of the distended bowel is of primary importance in the treatment of acute simple intestinal obstruction, because if the distention is not relieved, the viability of the bowel wall frequently becomes impaired and a fatal peritonitis ensues. In the simple adhesive type of obstruction, decompression often can be accomplished with the aid of nasal suction siphonage but in cases of obstruction due to other causes, operative decompression is often imperative.

Methods of evacuating the gut by stripping it at the time of operation as advocated by Moynihan and Holden have been condemned by many writers, Läwen, Morton and others. This procedure is usually accompanied by a severe fall of blood pressure in humans as well as in experimental animals. Morton reported operations in which deleterious results followed complete evacuation of the obstructed bowel stating that "stripping of the bowel is a very dangerous procedure." Läwen demonstrated in dogs and rabbits a drop in blood pressure and occasional death after stripping the obstructed bowel. Storck and Ochsner have recently shown that stripping of the obstructed intestine to evacuate its contents may reduce the blood pressure to shock levels. Intestinal motor activity subsequent to such manipulation is seriously impaired. Mann stated, "The easiest and most certain method of producing shock is by exposure and traumatization of the abdominal viscera."

The effect upon the blood pressure of manual strippings of the gut, in an attempt to reduce an incarcerated compound intussusception, was impressed upon one of us by the following case and prompted the experimental investigations which are reported.

Case Report

A male, age 12 years, was admitted on August 25, 1936. Admission temperature was 99.2°, blood pressure 110/60, and pulse 68. This boy had an eighteen hour history of cramp-like, colicky abdominal pain and vomiting. Upon admission a mass was palpable in the right lower quadrant of the abdomen. This mass was also palpable by rectum. The mass was tender but there was no tenderness elsewhere.

Laboratory examinations. The urine was negative. Hemoglobin was 75 per cent; W.B.C. 11,600; 88 per cent P.M.N.; 12 per cent lymphocytes.

The patient was operated upon under ether-oxygen anesthesia without delay. Preoperative medication consisted of 1/150 grain of atropine and grains 2 nembutal. There was no clinical evidence of impending shock before operation. The preoperative diagnosis was intussusception, volvulus, or intra-abdominal hernia. A compound enteric intussusception with a Meckel's diverticulum forming the apex of the intussusception was found. The first intussusceptum was rather easily reduced. Reduction of the secondary loop, however, proved to be very difficult and progressed slowly especially with the terminal 2 inches of intussusceptum. During the procedure a small tear through the serosa was produced. At this stage of the operation the patient's blood pressure suddenly became unobtainable, and he went into a state of profound shock in spite of the fact

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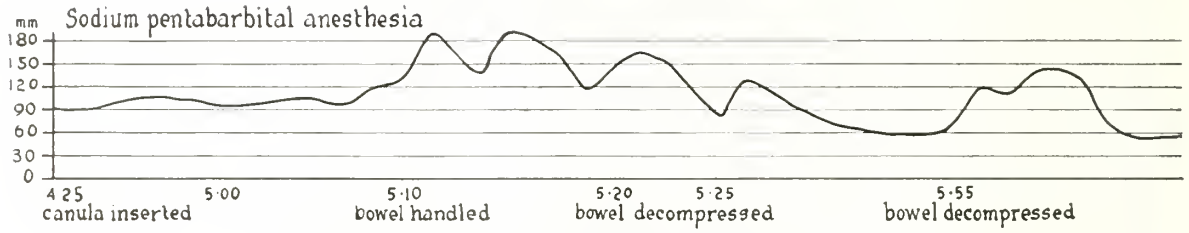

Fig. 1 Blood pressure effects of stripping obstructed bowel of dog No. 3 under sodium pentobarbital anesthesia

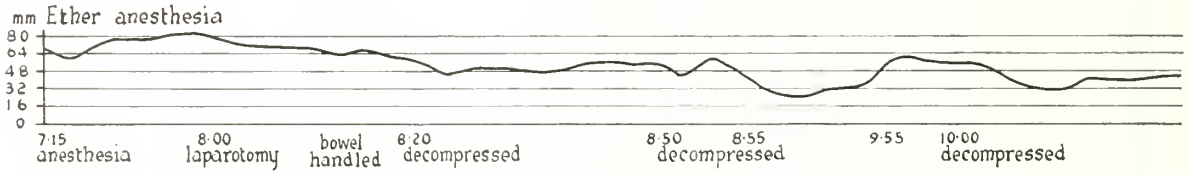

Fig. 2. Blood pressure effects of stripping obstructed bowel of dog No. 4 under ether anesthesia

that he had received 1500 cc. intravenous fluid during the course of the operation. The intussusception mass was then quickly exteriorized and the abdomen closed. Blood transfusion was started immediately and patient was given intravenous stimulants but expired on the table. The operating time was one hour, thirty minutes.

It is our clinical impression that had this been treated as strangulated obstruction and had the patient been transfused before and during the operation as is our present time procedure, this lethal outcome may have been averted. There is no doubt that the shock was a direct result of the trauma to the bowel.

The pathological report: "The specimen of bowel removed measured 29 centimeters in length in the mid-portion of which is a blind pocket representing the Meckel's diverticulum, the diverticulum measuring 5 cm. in length. Both diverticulum and bowel showed a considerable amount of hemorrhage and edema. Microscopic section showed hemorrhage and edema in the bowel wall."

The Role of the Anesthetic

The role of various anesthetics in hastening the onset of shock has been explored by several investigators. Parsons and Phemister subjected dogs to standard trauma by hammering the lower extremity with a padded hammer vigorously enough to bruise and lacerate the soft parts without breaking the skin or bones. Under ether, ether and morphine, barbital, and barbital and morphine anesthesia they found that the anesthesia did not influence the time of onset of shock. Similar results are reported by Roome, Keith, and Phemister using ether, and sodium barbital anesthesia. Parsons and Phemister indicate that the intestinal volume is not increased during the procedure. Blalock believes there is loss of fluid into the wall of and from the surface of the traumatized intestine in sufficient amounts to explain the fall of blood pressure.

Seeley, Essex and Mann, however, report that using a standard method of producing traumatic shock in the dog, sodium amytal anesthesia alone or sodium amytal used as a basal anesthetic or preliminary to ether anesthesia delays the onset of shock. Their method of producing shock was to deliver the entire length of small bowel from the abdominal cavity and to manipulate it gently by a continuous rolling motion between the hands of the operator.

Seeley, Essex and Mann noted that under ether anesthesia there is a concentration of hemoglobin and other cellular elements of the peripheral blood, while under sodium amytal anesthesia there is a diminution of hemoglobin and cellular elements. They feel the spleen to be largely responsible for this change in the concentration of erythrocytes. The role of the spleen in delaying the onset of shock has been referred to by Barcroft. Seeley et al state that loss of fluid from the circulation in the form of saliva and in the form of exudate from the surface of traumatized intestine is less rapid under sodium amytal anesthesia than under ether.

Experiments

These experiments were undertaken to compare the effect of trauma to the obstructed intestine upon the blood pressure under ether and barbiturate anesthesia.

Under aseptic conditions and sodium pentobarbital anesthesia the peritoneal cavity of 9 dogs was opened, the terminal ileum was identified, clamped and cut. Both ends were inverted and closed with a purse string suture, thus producing complete terminal ileal obstruction. After intervals of forty-eight to ninety-six hours the dogs were re-anesthetized with drip ether or sodium pentobarbital. A cannula was inserted into the carotid artery to record the blood pressure. The peritoneal cavity was then opened, the obstruction relieved, and the bowel suddenly decompressed by stripping the bowel from duodenum toward ileum. This was repeated at half hour intervals when the condition of the animal permitted.

Table I illustrates the effect of stripping and manipulation of the obstructed intestine on the blood pressure of the animals under sodium pentobarbital anesthesia. In 4 of 5 dogs there was an initial rise of blood pressure of from 10 to 40 mm. Hg. on manipulation or stripping of the obstructed bowel. After five minutes the blood pressure returned to its normal level and after repeated

TABLE I.
Blood Pressure Effects of Stripping the Obstructed Bowel of Dogs Under Sodium Pentobarbital Anesthesia

Dog	Weight	Duration of Obst. (hrs.)	Condition of Animal	Effect of Manipulation	Effect of Stripping	Subsequent Effect	Remarks
1.	22.7	72	Fair	10 mm. Hg. rise	20 mm. Hg. rise	Return to normal level and no change for 1 hour	
2.	18.2	48	Fair	No change	30 mm. Hg. rise	Return to normal level and maintained this 30 minutes	
3.	16.4	48	Fair	40 mm. Hg. rise	40 mm. Hg. rise on three occasions	Return to original level in 5 minutes	20 mm. Hg. drop in 1 hour
4.	18.6	52	Poor	15 mm. Hg. rise	No immediate change *20 mm. rise	In 30 min. fell 50 mm. Hg. Gradual fall to 20 mm. below former level	Shock after 3 hours
5.	12.7	72	Poor	20 mm. Hg. fall	No significant change	Slow gradual fall to exodus	Died 2½ hours after start of procedure

*Half hour after initial stripping.

TABLE II.
Blood Pressure Effects of Stripping the Obstructed Bowel of Dogs Under Ether Anesthesia

Dog	Weight	Duration of Obst. (hrs.)	Condition of Animal	Effect of Manipulation	Effect of Stripping	Subsequent Effect
1.	22.1	96	Poor	20 mm. Hg. fall	20 mm. Hg. fall	Continued to fall to exodus in 30 minutes
2.	14.1	48	Good	20 mm. Hg. fall	No significant change on 3 occasions	Slow gradual drop of 30 mm. in ½ hour
3.	13.6	48	Fair	50 mm. Hg. fall	No change on first occasion *35 mm. fall when decompressed ½ hour later	Slow rise but not to normal level. After 2 hours animal was in shock
4.	10.0	72	Fair	15 mm. Hg. fall	15 mm. Hg. fall *30 mm. Hg. fall †30 mm. Hg. fall	Slow rise to 10 mm. less than former level. Return near to former level. Slow rise to 10 mm. less than former level.

*Half hour after initial stripping.
†One hour after previous stripping.

manipulation later fell to subnormal levels. In one animal (dog No. 5) there was an initial sudden fall of blood pressure on manipulation of the intestine followed by a slow gradual fall of blood pressure with exitus two and one-half hours later. This dog had been obstructed seventy-two hours. His condition was poor; he was listless, dehydrated, and markedly distended.

Table II illustrates the effect of stripping and manipulation of the obstructed intestine under ether anesthesia. This resulted in an initial fall of blood pressure of from 15 to 50 mm. Hg. which was followed by a gradual rise of blood pressure but usually not to previous normal levels. On repetition of the procedure the blood pressure would fall again and return to a lower level. Dog No. 1 had been obstructed ninety-six hours and was gravely ill. He died thirty minutes after laparotomy had been performed. This animal showed the same response as dog No. 5 in table I. Both were apparently critically ill and unable to withstand any shocking operative trauma. Rapid decompression of the distended abdomen of animals in potential shock has been shown to produce lethal outcome by Wangensteen and Scott.

Comment

It appears from these studies that the experimental animals tolerated the primary manipulation of the bowel better under sodium pentobarbital than under ether anesthesia but that repeated manipulation and stripping of the bowel caused sufficient trauma by some mechanism to bring about shock and depression of blood pressure under either form of anesthesia. This depression of blood pressure following manipulation of the intestine is probably proportional to the loss of fluid from the circulation as shown by Blalock. Whether some unknown depressor substance, perhaps of the nature of histamine, is pressed into the circulation is still a moot question. Blalock's work has more to recommend it. The role of the autonomic nervous system in producing changes of the blood pressure also cannot be overlooked. The immediate changes on the blood pressure following the primary manipulation are most likely due to a nervous reflex.

It is our clinical impression* that ether anesthesia increased the tendency to shock more than the other forms of anesthesia. Adequate pre-anesthetic medication with pentobarbital sodium and morphine decreases this tendency. Cyclopropane anesthesia predisposes to shock less than does ether, and pentobarbital, less than either one. However, we have not had sufficient clinical experience with pentobarbital anesthesia in major or shock pro-

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ducing surgical procedures to bear out this last impression.

Since it has been shown that when death occurs early in the course of strangulation obstruction it is usually due to surgical shock (Scott and Wangensteen) and that this shock is due to loss of blood and hemorrhage into the bowel lumen, bowel wall and peritoneal cavity, it is apparent why patients with suspected strangulation obstruction should be considered poor operative risks. Such patients should be transfused before operation—remembering that an ounce of prevention is worth a pound of cure. It is much easier to treat potential shock prophylactically than to resort to frantic and heroic procedures after its onset.

Summary and Conclusions

1. Operative trauma, especially stripping of the obstructed intestine in an acutely ill animal can be rapidly fatal.

2. Manipulation of the obstructed intestine under sodium pentobarbital anesthesia in dogs tends to cause an initial immediate rise of blood pressure. Manipulation of the obstructed intestine under ether anesthesia in dogs tends to cause an initial fall of blood pressure.

3. Manipulation of the intestine and other shock-producing procedures cannot be tolerated under either sodium pentobarbital or ether anesthesia if the animal is critically ill or in a potential shock phase of the disease.

4. A clinical case report in which the lethal outcome followed manipulation of the bowel is reported.

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Pursuant to its aim of raising the standards of surgery, the American College of Surgeons has published a 24-page *Manual of Graduate Training in Surgery* in which are incorporated the requirements for its approval of programs of training in general surgery and the specialties in hospitals of the United States and Canada.

The *Manual* is the outcome of ten years of study of educational programs in surgery by the Board of Regents and several committees of the College. In 1937 a Committee on Graduate Training in Surgery was established under whose direction the field staff of the College personally surveyed a selected group of hospitals in connection with the work of the Hospital Standardization Department. Based on the findings of these surveys, "Fundamental Principles and Criteria" were developed which have been applied in evaluation of plans for graduate training in surgery. The plans of 179 hospitals have so far been approved by the College. The new *Manual* is an elaboration of the "Fundamental Principles and Criteria" and will in the future be applied in determining eligibility for the Approved List to be published in the Approval Number of the College *Bulletin* in October of each year.

Ovarian Hemorrhage as a Cause for Acute Abdominal Symptoms*

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WHEN one is called upon to see a patient with an acute abdomen, one must always consider the possibility of an intra-abdominal hemorrhage, especially in the female in whom this condition has always the potentiality of arising from the genital organs.

Rupture of the Graffian follicle occurs as a natural process in the menstrual cycle, but when the ovary is normal, the bleeding is practically negligible. In the presence of abnormal conditions, in which there may be congestion or hyperemia of the thecal vessels it is conceivable that hemorrhage could occur. Rupture of the corpus luteum, however, is not a natural phenomenon, and when this occurs it is generally associated with hemorrhage.

According to Teacher, premenstrual hyperemia and capillary hemorrhage may cause a hematoma of the corpus luteum which, if sufficiently tense, may rupture through the stigma, lacerate the adjacent thecal vessels and cause intraperitoneal hemorrhage.

The most frequent cause for intra-abdominal hemorrhage in the female is ectopic gestation. In the nongravid woman it most commonly occurs as a sequel to a ruptured corpus luteum or graffian follicle cyst. Trauma and malignancy have been recorded as being occasional factors for the development of this condition.

Corpus luteum perforation has been reported to occur following a blow to the abdomen (Christopher), during quiet sleep, and during coitus. Ovarian ruptures have been reported to occur during ordinary activities, such as walking, dancing, and working. Crousse, Greenhill, Pratt, and Novak have reported its occurrence during pelvic examination.

Pathology

Corpus luteum cysts are distinguished by their central hematoma, separated from the lutein cells by a dense fibrous layer.

The patient who has a simple rupture of the graffian follicle usually presents a sero-sanguinous intraperitoneal fluid. If a richly vascularized corpus luteum has ruptured, there may be excessive bleeding.

The ruptured portion of the ovary is often adherent to the posterior wall of the uterus or to the broad ligament. If the clot is removed from the ovary the cavity presents a smooth, yellow, glistening surface. Microscopically, the graffian follicle is distinguished by its membrana granulosa and the clumped, crowded cells of the theca interna still well preserved.

Clinical Symptoms

In all probability, most surgeons have operated upon patients with ovarian cysts in whom small amounts of blood have been found in the peritoneal cavity. In many of these cases the patient will relate a history which reveals that she has had intermittent attacks of mild or moderately severe low abdominal pain lasting for thirty or forty minutes followed by relief and subsequent residual soreness for three or four days. These attacks of pain may represent repeated rupture of corpus luteum or graffian follicle cysts with small amounts of hemorrhage to account for the residual soreness. It is much less common to encounter a case in which the symptoms persist or assume serious proportions. It is more likely that many of the cases of ovarian rupture have been taken to the operating room with a clinical diagnosis of ectopic gestation. Histologic examination may have failed to disclose endometrial cells, and if such is the case, a more careful examination of the excised tissue would probably disclose a large ruptured graffian follicle or the walls of a corpus luteum cyst. Some men (Forssner) believe that ovarian perforations are unrecognized ovarian pregnancies, but most writers find themselves unable to agree with this.

The clinical history and symptoms in which the patient describes a three to six weeks missed menstrual flow, associated with spotting at the supposed next interval, suggesting ectopic pregnancy, is easily recognized. One also becomes aware of the shock-like reaction and the characteristic exsanguination as the distended tube and its surrounding blood vessels rupture, bringing about an emergency which must be treated without delay. But when these symptoms are encountered in the virgin or in the married woman who emphatically denies a fertile exposure, it is easy to be at a loss for a diagnosis. It is at this moment that the possibility of a ruptured graffian follicle or corpus luteum cyst should be brought to mind for these entities may present identical clinical symptoms with ectopic pregnancy.

If the bleeding on these occasions is severe, the matter of a diagnosis is more of academic interest than of clinical value for the treatment would be the same. However, if the intraperitoneal bleeding is less severe so that the shock and exsanguination do not become evident, the diagnosis may become readily confused with other types of intra-abdominal pathology.

The clinical manifestation may depend upon the size of the perforation and the degree of hemorrhage. The one with asthenic symptoms may present only mild pain in the abdomen, despite considerable blood in the peritoneal cavity; whereas the patient who has a severe rupture and rapid bleeding will evidence violent pain and symptoms of shock. All gradations of an acute abdomen may be present and, depending upon the severity of these symptoms, one may find difficulty in differentiating it

*Presented at the St. Barnabas Hospital Staff Meeting, November, 1938.

from other diseases. Acute appendicitis, acute cholecystitis, perforated peptic ulcer, pancreatitis and mesenteric thrombosis have been the most frequent diseases included among the differential diagnoses.

In a small series of 10 cases of hemorrhage from the corpus luteum, reported by Leon Israel, of Mt. Sinai Hospital, New York, 5 were diagnosed as acute appendicitis, 4 as ectopic pregnancies, and 1 as a myoma uteri. It is not impossible, however, to make a correct preoperative diagnosis, for Hoyt and Meigs made correct diagnoses in 17 out of 58 cases at the Massachusetts General Hospital.

The symptoms which might help in making a diagnosis of ovarian rupture are not very distinct, and there is no pathognomonic sign; however, there is a fairly characteristic relationship between the time of the ovarian rupture and the menstrual cycle. Follicular rupture occurs at approximately the mid interval, whereas rupture of the corpus luteum occurs in the last half of the cycle, or in the premenstrual period.

The pain is more often localized in the right lower quadrant of the abdomen because of the more frequent involvement of the right ovary. Pain may radiate into the flanks or shoulder strap areas, depending upon the amount of blood in the peritoneal cavity. Nausea and vomiting are often present. There may be a moderate elevation of temperature and a p.m.n. leucocytosis. The sedimentation rate is markedly increased. (This is less rapid in appendicitis, thereby assisting to differentiate between the two conditions). Tenderness, rigidity and muscle spasm may be present and it is more often found in the lower abdomen.

A mass in either adnexal region may lend suspicion, but is often confusing unless the soft boggy sensation of a hematoma is elicited.

If bleeding has been profuse, the hemoglobin and erythrocyte count will be decreased.

This rather confusing array of clinical signs and symptoms do not seem to be very convincing of any specific diagnosis. However, if one takes into consideration the clinical history, the relationship of its development to the last half of the menstrual cycle, the markedly increased sedimentation rate and the decreased hemoglobin and erythrocyte count in the presence of other signs and symptoms suggesting an acute abdomen, one can become very suspicious of ovarian pathology.

I wish to present 2 cases which bear out these contentions:

Case 1. A woman, aged 39, was first seen at her home on October 26, 1935. At that time she gave a history of having experienced pain in the lower part of her abdomen, which lasted for only a short time and then subsided. This pain developed during the latter part of her menstrual cycle. She retained some residual soreness for five or six days. I was suspicious of appendicitis, but because the symptoms were subsiding, convalescence was allowed to continue without further specific treatment.

About three years later, on March 15, 1938, she again presented herself at my office, complaining of pain in the abdomen. The pain was mostly on the right side, in the right flank, and in the right subcostal region.

She stated that this pain had its onset about ten days previously, and was initiated by pain in the rectum. A couple of days later the pain seemed to settle down in the lower abdomen, and a few days later she began to observe pain in the right flank and under the margin of the right ribs. The pain was more severe when she was lying down. There was no aggravation of pain on deep respiration. The last menstrual period was one and one-half weeks early, and lasted for two weeks. This attack of pain was initiated about 12 days after the onset of the last menstrual period.

The pelvic examination revealed an indiscreet mass in the right side. This was definitely tender, but not severe.

The hemoglobin was 40 per cent, sedimentation rate 30 mm. in 1 hour (Cutler).

The physical examination was otherwise negative. The patient was then admitted to the St. Barnabas Hospital, and after other possibilities were ruled out, a diagnosis of ruptured ovarian cyst was made.

Laparotomy revealed that both ovaries were enlarged, cystic and adherent to the posterior surface of the uterus, and broad ligament. There was about 10 ounces of bloody fluid in the peritoneal cavity. Its source was found to be from a ruptured ovary. The postoperative convalescence was uneventful.

Case 2. A girl, age 19, gave a history of having had recurrent attacks of pain in the lower abdomen for several months. These came in the intermenstrual period, but were never constantly related to any particular phase of the menstrual cycle. The present attack had its onset 12 hours previously, and began 28 days after the onset of the last menstrual flow. The pain started on the left side, but became readily generalized. She described its onset as sudden and severe. Physical examination revealed tenderness in the right lower quadrant of the abdomen with moderate muscle spasm and rigidity. Temperature was 99°. There was some tenderness in the left lower quadrant of the abdomen, but this was minimal.

Preoperative diagnosis: acute appendicitis. Exploration revealed about 8 ounces of blood in the peritoneal cavity. The left ovary was enlarged and showed an area of rupture. The appendix was normal. Convalescence was uneventful.

CONCLUSIONS

Hemorrhage from a ruptured ovary may produce symptoms of an acute abdomen. If the hemorrhage is severe, the resulting shock and exsanguination will necessitate an emergency operation. If the hemorrhage is less severe so that the picture of shock does not become evident, then one is always confronted with the difficulty of making a differential diagnosis. If the acute abdominal symptoms persist, one is justified in doing an exploratory operation for the purpose of making a definite diagnosis and controlling the bleeding from the ruptured ovary.

The Physical Education Teacher's Responsibility for Health Instruction*

Mabel E. Rugen, Ph.D.†
Ann Arbor, Michigan

Introduction

HEALTH instruction may be defined as any planned experience conducted under the auspices of a school or other educational agency for the purpose of improving health behavior, the use of scientific information for understanding the significance of this behavior, and for contributing towards the development of willful self-direction and responsibility in matters of health for oneself personally and in relationship to others. The focus of attention in health instruction is *the behavior of the individual* for whom the instruction is intended. Herein health instruction differs in emphasis from health service and healthful living, other important aspects of the health education program.

In healthful living and health service the focus is on administrative controls. Healthful living is concerned with the sanitation and safety of the environment, the organization of time and activities; it is concerned with the establishment of those conditions that will enable an individual to live safely, sanely and healthfully in particular situations. While the establishment of procedures and practices that provide sanitary environment and healthfully arranged days for individuals, have a contribution to make to health instruction, the focus is primarily on the creation of the right kind of conditions —a task which is administrative in nature.

Health service is concerned with protection for the individual; protection through the administration of adequate health examinations and follow-up and through the establishment of procedures designed to prevent (and control) diseases and accidents. Health service activities also contribute to health instruction, but here again the focus is on the establishment of procedures and practices that will prevent or correct conditions that handicap individuals. This calls for planning on the part of administrators supplemented by the assistance of technical consultants in the health field.

Problems and Interests of College Students

College students have many problems and interests, a number of which center around health education. Symonds has reported "fifteen areas of experience in which problems arise" as follows:

1. Health—eating, drinking, exercise, posture, sleep and rest, air and temperature, sunlight, clothing, bathing, care of special parts, cleanliness and prevention of disease, excretion and elimination, use of drugs.
2. Sex adjustments—love, petting, courtship, marriage.
3. Safety—avoiding accidents and injuries.
4. Money—earning, spending, saving, etc.
5. Mental hygiene—fears, worries, inhibitions, compulsions, feelings of inferiority, fantasies, etc.
6. Study habits—skills used in study, methods of work, problem solving.
7. Recreation—sports and games, reading, arts and crafts, fellowship and social activities, hobbies.
8. Personal and Moral Qualities—qualities leading to success, qualities of good citizenship.
9. Home and Family Relationships—living harmoniously with members of the family.
10. Manners and Courtesy—etiquette.
11. Personal Attractiveness — personal appearance, voice, clothing.
12. Daily schedule—planning the twenty-four hours in a day.
13. Civic interests, Attitudes and Responsibilities.
14. Getting Along with Other People.
15. Philosophy of Life—personal values, ambitions, ideals, religion.[1]

Students were asked to rank these fifteen items first in order of their being personal problems to them, and second in order of their interest to them. The results of this ranking for the college group appears in Table I.

TABLE I
Problems and Interests of Older Adolescents in College (15-22 Years of Age[2])

Item	Ranking	
	As a Problem	As an Interest
1. Money	1	5
2. Study Habits	2	12
3. Health	3	1
4. Philosophy of Life	4	2
5. Personal and Moral Qualities	5	4
6. Personal Attractiveness	6	10
7. Mental Hygiene	7	8
8. Daily Schedule	8	15
9. Manners and Courtesy	9	7
10. Sex	10	3
11. Civic Interests	11	11
12. Getting Along with Other People	12	9
13. Recreation	13	6
14. Home and Family Relationships	14	13
15. Safety	15	14

It is apparent from this table that there are a number of problems and interests pertaining to health instruction.

Diehl and Shepard have discussed health problems of college students in terms of " . . . (1) those resulting from deficient health care and education in the earlier years of life, and (2) those associated with the college environment itself."[3] Furthermore, they maintain:

*Presented before the twentieth annual meeting of the American Student Health Association, New York City, December 28-29, 1939.
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> The health of the individual entering college reflects the health interest and information of his parents, and the opportunities for health protection and teaching afforded in the lower schools and the facilities for promotion of health in the community where he spent his earlier years. Lack of health care and education in these younger years is evidenced by the physical defects, emotional and social maladjustments, and health ignorance which individuals bring to college.[4]

Interests and needs of college students in hygiene have been shown by Rogers.[5] The Carnegie Report[6] has given us further evidence of problems and interests of college students. The Educational Policies Commission studying needs of all individuals in an effort to re-state objectives for education, maintains that men need always to (1) care for their bodies; (2) rear their children; (3) secure economic necessities; (4) organize for civic action; (5) engage in recreation, i. e., use their spare time desirably; and (6) satisfy their religious cravings.[7] Individuals want to belong, they want to be wanted, they want new experience and variety, they want to feel secure in their various relationships, they want recognition for their achievements, they want to avoid physical discomfort, tension and strain; they want to explore and satisfy their innate cravings for self-expression.[8]

These various statements of problems, interests and wants are included to remind us that any program of health instruction must be premised on these basic needs. There is increasing evidence to show that learning takes place when there is a felt need on the part of the learner. This means, of course, that the interests and problems of the student must be utilized in the teaching process.

To return to the list of problems and interests submitted by Symonds, we might inquire how the teacher of physical education may contribute to the solution of those problems directly associated with health instruction.

Opportunities in Physical Education for Health Instruction

The physical education teacher has many opportunities for health instruction, if he remembers that the focus of his attention must be the individual's problems and interests. Furthermore, the teacher must understand that health instruction does not mean a series of lectures, often uninteresting, about health. Health instruction, it will be recalled, has been defined as planned experiences which contribute to the improvement of health behavior, and more intelligent use of scientific information regarding the significance of this behavior as it pertains to the individual himself and those with whom he comes in contact.

The kind of experiences that will contribute to health instruction, which the physical education teacher might plan may be grouped under three major headings: (1) those associated with his direct personal relationships with students in the usual conduct of physical education classes; (2) those associated with the adoption of policies and procedures designed to protect the student from infection, injury and unnecessary strain; and (3) those associated with the healthfulness of the physical education plant and program.

The kinds of experiences which students might have in each of these groups is outlined briefly.

1. Experiences associated with the direct personal contact between students and physical education teacher.
   a. A consideration of the factors which condition success in physical education achievement. This might include a consideration of such factors as sleep, rest, and fatigue; diet; defects and infection; alcohol. Likewise, it might include a consideration of efficiency of body coördinations and the mechanics of skilful movement. The effects of meaningful practice in achieving skill. What is meant by synchronization or harmonization of the neuro-muscular mechanism and its relation to rhythm, grace, beauty, in movement?
   b. A consideration of the effects and value of exercise, physical education, and play. Physiological values; psychological values; therapeutic values; social-recreative values. These effects and values might be associated with the teaching of various skills, sports, and other physical education activities. Is it not possible to teach something of these values at the same time one is teaching the mechanics of good form, and the rules governing the activity? Why should not the various hygienic values, inherent in well conducted physical education classes, be pointed out in the same way that an experienced coach points out the opportunities to use certain strategy in game situations?
   c. A consideration of the contributions which physical education makes to the solution of problems associated with such areas of experience as sex adjustment, personal attractiveness, getting along with people, manners and courtesy, mental hygiene, safety, personal and moral qualities, recreation and other interests of the later adolescent. This implies more opportunities for co-education in physical education classes, for coöperation between those who direct the social, extra-curricular, guidance activities on the college campus and the physical education department. It also implies the provision of individualized instruction through conference and other procedures.

2. Experiences associated with the adoption of administrative policies and procedures designed to protect the student from infection, injury and unnecessary strain. These experiences of students are planned directly for them by the instructional staff. They might be characterized as "health service" experiences. From the point of view of the physical education department they might include:
   a. Provision for health examinations and the arrangement of the kind and amount of physical education in terms of the recommendations of the examining physicians.

b. Knowing the results of the health examinations of students in classes and coöperating with the college health service in urging the correction of defects. Noting the response of the student to exercise, and calling any deviations from the normal to the attention of the medical staff. This calls for cooperative planning between college physicians and physical educators.

c. Provision for protection against such infections as colds and skin infections through the establishment of hygienic procedures in swimming pools, locker and shower rooms, gymnasiums, and play fields. An adequate plan of "excuses" from physical education also contributes here.

d. Protection against injury through the development of adequate controls to prevent injury, and the provision of first aid in case of injury.

3. Experiences associated with the healthfulness of the physical education plant, and the conduct of the program. This may be thought of as healthful living through physical education. Contributions here would include:

a. Providing conditions that were sanitary. This means environmental sanitation for the entire physical education and athletic plant according to recommended standards. It also means opportunity for personal hygiene practices on the part of the student. Such routines as regular showers with soap and towels available; clean costumes; wearing one's own clothes; attention to minor injuries, etc., contribute to healthful living.

b. Organizing the program in such a way that rush and hurry will be minimized, that the length of the instructional period is adequate, that the pupil and teacher load in physical education activities will not be too heavy, that there will be opportunity for student choice of activities, and that good student-teacher relationships are developed and maintained.

Other opportunities for health instruction through physical education might be listed,[9] but perhaps those cited are adequate to point out the kind of analysis required if physical education is to realize its contribution to health.

Summary

Health instruction is one aspect of health education. It is concerned primarily with changes in health behavior on the part of the individual. Its focus of attention is the individual himself. It is concerned with the provision of interesting experiences that will challenge the individual to want to live more healthfully. Problems and interests of college students must be utilized in developing an effective health instruction program. Physical education has a contribution to make to health instruction provided it analyses its program in terms of the opportunities present for health instruction. Physical education teachers should recognize the contribution their coöperation with the health service program of the college can make to health instruction. They also should recognize their responsibility for organizing and conducting their program in such a way that healthful living results. And furthermore, they should know their students, as well as their activities. This will enable the physical education teacher to point out from time to time values inherent in the doing of physical education activities that have health instructional content. The method to be employed in this teaching should put the student first, be informal yet informative in nature.

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The
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VACATION

It is no longer necessary for physicians to urge upon people the desirability of taking vacations. It has become the accepted custom, and employers take it for granted that they must plan on a routine schedule of letting their workers off for a couple of weeks each year.

In this section of our country the favorite holiday months are June, July, and August. Schools are out at this time so that students and instructors can get away. The heated season induces many others to flee from the city seeking the simple and unconventional life of lake cottage and fishing resort. Convenient excursion tours and special rate inducements are made to National parks and playgrounds to add interest to this universally accepted practice of getting away from the daily grind.

The purpose of a vacation should be to furnish an interval of rest, relaxation and change. Many persons pride themselves on never taking a vacation. When they get along in years they look forward to a long and therefore "much deserved vacation" in final retirement. That, however, is not in any sense a vacation. It may fulfill the first two purposes of rest and recreation, but certainly not of change.

Retirement implies permanency. It is not an interlude in some vocational pursuit. It is not a rest from labor to which one plans to return. It is not recreational in the sense of building up increased vigor for uncompleted tasks. It is decidedly the converse. It is something that is eventually enforced upon us all by age and infirmity. In any case it is a resignation to hopeless monotony. How can anyone look forward to or speak of that as a vacation?

A. E. H.

Book Reviews

Chemistry and Medicine: Papers presented at the fiftieth anniversary of the founding of the Medical School of the University of Minnesota, edited by Maurice B. Visscher, M.D.; cloth, 296 pages with charts, photographs and diagrams; Minneapolis: The University Press: 1940. Price $4.50.

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This book comprises a collection of papers delivered by faculty members of the University of Minnesota and by invited guests from other universities at the celebration of the fiftieth anniversary of the founding of the Medical School. The subjects discussed cover a wide range in the fields of chemistry and medicine, emphasizing especially progress in the application of chemistry to medicine, aspects of immunity and chemotherapy, researches in metabolism, and studies in the nervous control of the organism.

Professor Herbert Freundlich contributes a brief chapter on some aspects of the colloid chemistry of membranes. His recognized place in this field makes his contribution authoritative and fortunately he has the ability to present his material in understandable language. Maurice B. Visscher writes in an interesting manner on osmotic work in living systems. He calls attention to the importance of the contractile vacuoles in unicellular animals and other cells for regulating the osmotic interchange. John P. Peters contributes a chapter on concentration by the kidney which deals with the fundamentals of kidney physiology and excretion.

A highly technical discussion of vitamin research is contributed by Lee Irwin Smith. The paper contains a mass of intricate structural formulae of vitamins and related compounds. The paper of George O. Burr deals with the importance of fats in the diet, a subject to which he has richly contributed through original research. He points out that our knowledge of fatty acid metabolism, though extensive, is still in its infancy and that even today little is known about the enzymes producing the oxidation of fats. Charles H. Best discusses his interesting experiments on blood clotting in which he uses heparin as an anticoagulant, and he states that at least experimentally it has been established that intravenous injections of heparin in experimental animals prevent thrombosis under conditions in which blood clotting would otherwise develop. The value of heparin in clinical medicine as a preventative of postoperative thrombosis remains as yet inconclusive.

Michael Heidelberger discusses certain chemical trends in the study of immunity and Robert G. Green gives a valuable discussion of the biology of animal viruses. Perrin H. Long contributes an important chapter on the subject to which he has given a great deal of his time and energy in recent years, the mode of action of sulfanilamide and its derivatives. Long has greatly increased our knowledge in this important subject in the past few years. Henry F. Helmholz compares the relative efficiency of urinary antiseptics. Sulfothiozol is not included in this discussion probably because it was still unobtainable for clinical use at the time the paper was written. This latter chemotherapeutic agent seems to be especially efficient in streptococcus fecalis and staphylococcus.

Irvine McQuarrie attempts to explain the mechanism of convulsive reactivity through physiochemical approach. The factors in hypoparathyroidism, in which a disturbance in the plasma electrolytes seems to be important, and in insulin shock from hypoglycemia, in which changes in the glucose level seem to be the only constant finding, and in genuine epilepsy, seem to have a common denominator in the disturbances in the surface functions of the brain cell membranes. In genuine epilepsy there is probably some inherent defect in the brain cells which tends to produce spontaneous abnormal electrical potentials, and these result in convulsive seizures. Herbert S. Gasser discusses the meaning of irritability in his method of analysis of nervous action. Detlev S. Bronk writes interestingly on the nervous regulation of visceral processes. He states that life's activities can best be explained in terms of cellular processes. The concluding chapter is by Walter B. Cannon, who espouses the chemical mediation of nerve impulses. He presents experimental evidence to show that muscular contractile response to nerve stimulation is due to the interaction of acetylcholin and not to electrical transmission.

This book is valuable as a reference book for a clear understanding of the application of chemistry to medical science.

Growing Plants Without Soil, by Dr. R. Matlin, M.A., Professor of Plant Chemiculture, Belmont Evening High School, Los Angeles, California; 135 pages; New York: Chemical Publishing Co., 1940. Price $2.00.

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Growing Plants Without Soil is one of the newer books that has been written to take advantage of the increased interests of gardeners in growing plants by the administration of chemicals in a soil-less culture media. Botanists and plant physiologists have used this method of plant culture for over one hundred years in controlled experiments. It is only in recent years, however, that the commercial possibilities have been considered feasible.

The book is elementary in text, fairly well illustrated, and covers all of the subjects briefly and rather completely. It is a good book for the general gardener as well as for the man who has a leaning toward plant and chemical experimentation.

It is worth reading by anyone who has the research instinct or has the makings of a potential Burbank.

Loose-Leaf Specialties in Medical Practice, by various authors, edited by Edgar Van Nuys Allen, M.D., Chief of a Section in the Division of Medicine, The Mayo Clinic, Rochester, Minnesota; two volumes, 1000 pages and 300 illustrations; New York: Thomas Nelson and Sons: 1940. Price $25.00.

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This elegantly printed set of two volumes consists of essays on various specialties: ophthalmology, otolaryngology, neurology, psychiatry, vitamins, allergy, orthopedics, obstetrics and gynecology, endocrinology, urology and proctology. There is in preparation a section on dermatology and syphilology. The purpose is stated in the editor's introduction: "This work is intended to be a ready source of information to all who practice medicine, to answer most of the questions the specialist may ask about other specialties, and to furnish concise information about the specialties to the medical student. . . . Effort is made to answer the questions which the physician most commonly asks: 'What is wrong with my patient?' and 'How shall I treat my patient?'." The difficulty and solution of the problem of writing a chapter for these volumes is well put by Emmett on Urology: "The problem may be solved in two ways. The first method is to write briefly on all subjects making an abstract of little value to anyone. The second method is to discuss liberally the more common conditions that are likely to confront the general practicing physician and discuss briefly or omit completely the less common lesions." The latter method obviously has been used by all the contributors.

Gradle writes the section on ophthalmology and addresses himself so directly to his reading audience that he frequently lapses into the second person: "Please do not forget that time is of vital importance in dealing with acute incompensated glaucoma. Remember that the miotic you order must be fresh and that when eserine turns from pink to red its efficacy is lost and the drug is extremely irritating to the eye." Buie describes the technique of proctoscopy minutely and brilliantly. He emphasizes the fact that a successful examination depends upon the physician's tact in foreseeing and controlling the patient's emotional response. The short forty page section on psychiatry gives an excellent picture of present-day concepts. Indications and methods of treatment are clearly stated.

The set will be of particular value to those whose contact with the specialties is limited. Whether it will continue to be of value depends upon the editor's and publisher's zeal in replacing out-dated sections. References are few; bibliographies brief or absent. There is a serviceable index.

News Items

Dr. G. M. Williamson, Grand Forks, North Dakota, has been elected president of the Great Northern Railway Surgeons Association, and Dr. Roscoe C. Webb, Minneapolis, secretary-treasurer.

Dr. T. F. Bush has joined Dr. H. L. Casebeer, Butte, Montana, as an associate in eye, ear, nose and throat diseases. A graduate of Loyola University School of Medicine, Dr. Bush completed his internship at St. James Hospital, Butte, July 1.

The appointments of Dr. Louis S. Gerber as a resident in medicine and Dr. W. M. Downing of Hanover, N. H., as a resident in surgery at the Northwest clinic in Minot, N. D., have been announced by Dr. A. L. Cameron, chief of staff. Dr. Gerber has completed a year's internship training at Trinity hospital in Minot. He is a graduate of the University of Minnesota.

Dr. D. D. Gnose, of Anaconda, Montana, has joined the staff of the Murray hospital, Butte. For the past year Dr. Gnose served on the intern staff at the Louisiana Charity Hospital in New Orleans.

Dr. D. R. Driver has joined the Quain and Ramstad Clinic staff of Bismarck, North Dakota. A graduate of the medical school of Louisiana State University, 1939, Dr. Driver interned at Ancker Hospital, St. Paul, Minnesota.

Dr. B. L. Pampel, Warm Springs, Montana, was named second vice-president of the Pacific Northwest Medical Association at the annual convention held in Spokane, Washington. Among the state councillors elected were: Dr. A. J. Movius, Billings, and Dr. T. J. B. Shaney, Butte.

Dr. Olaf Heiberg is now practicing in Montevideo, Minnesota. A graduate of the University of Minnesota Medical School in 1935, Dr. Heiberg spent three years as resident physician in Minneapolis General Hospital and for the last two years was a member of a clinic in Manhattan, Kansas.

Dr. W. A. Vincent, Belle Plaine, Iowa, spent his ninety-fourth birthday in Oronoco, Minnesota, where he practiced in his youth. Dr. Vincent is the only remaining Civil War veteran in a wide Iowa area. He was a physician at the Rochester State hospital 60 years ago.

Another series of infant and preschool child conferences will be held in Williams county, North Dakota, August 1 to 12. Coöperating for these health conferences are the local boards of health, county advisory committee on health, physicians and dentists and the division of child hygiene of the state department of health.

Dr. J. C. Litzenberg, professor emeritus of the medical school, University of Minnesota, and head of the department of obstetrics and gynecology of the Nicollet Clinic, was elected president of the American Gynecological society at the annual conference in Quebec, Canada.

Licenses to practice medicine and surgery in North Dakota were awarded to 25 physicians as a result of medical examinations held in Grand Forks, July 5, Dr. G. M. Williamson, secretary of the state board of medical examiners, has announced. The list includes one woman, Tula Wilhelmina Gronewalid of Jamestown. Others receiving licenses were Louis Silverman and Walter C. Dailey, Grand Forks, Frank O. Robertson, East Grand Forks, Roy K. Quamme, Portland, Stephen C. Bacheller, Enderlin, Donn Raymond Driver, Bismarck; Chauncet M. Kelsey, Louis S. Gerber, Evan C. Stone, Sherrel D. Patton, Clayton H. Halverson and William M. Downing, Minot, Hugh William Hawn and Orville R. Kelly, Fargo; Robert K. Dodd, Wimbledon, William A. Schumacher, Hettinger, Howard R. Wold, Grafton, Claude Carol Curtis, Beach, Emil Theodore Keller, Rolette; Henry V. Madsen, San Haven, Maxwell H. D. Johnson, Watford City, Frederick C. Kohlmeyer, Blue Earth, Minn., Harry S. Friedman, Minneapolis, and Hagbart R. Rice, Moorhead, Minn.

Dr. J. H. Raymond, formerly of Triumph, is now practicing in Canby, Minnesota. He purchased the practice of Dr. G. M. Tangen.

The American Board of Ophthalmology announces there will be only one written examination during 1941. This will be held in various cities throughout the country on March 8th. Candidates enrolled in the Preparatory Group who have been advised that they will be eligible for examination during 1941 should make application at once to take this written examination. Application must be made on the regular blanks provided for the purpose and must be received in the Board Office before December 1, 1940.

Necrology

Dr. A. S. Rider, 63, of Flandreau, South Dakota, died suddenly at his home July 8, 1940. He had practiced in Flandreau about 30 years, was active in civic affairs and at one time was president of the South Dakota State Medical Association.

Dr. Floyd J. Malloy, 37, Anaconda, Montana, died July 8, 1940. He had practiced in Anaconda since 1929.

Dr. Herbert W. Jones, 67, Minneapolis, Minnesota, died July 10, 1940. He had practiced in Minneapolis 36 years and was a former chief of staff at Northwestern hospital.

Dr. F. J. O. Kraushaar, 53, Aberdeen, South Dakota, died June 26, 1940.

Dr. George A. Holdridge, 63, Foley, Minnesota, the "doctor who never sent a bill," died recently. Dr. Holdridge died just before the village was to present him with another car, the third to be bought for him by "chipping in" of his friends and neighbors. He came to Foley in 1901. He later practiced three years at Browerville, Minnesota, but returned to Foley.

Dr. Harold Reese, 72, Ogilvie, Minnesota, died recently.

Future Meetings

The American Academy of Ophthalmology and Otolaryngology will hold its forty-fifth annual convention in Cleveland, October 6 to 11, with headquarters at the Hotel Cleveland. The Academy, an organization of more than 2,500 specialists in diseases of the eye, ear, nose and throat, carries on an active program of education for its members. In addition to scientific papers, an elaborate series of courses is presented at each convention to bring the members up to date in their chosen fields. More than 100 of these teaching lectures will be offered this year. In the past year arrangements have been made to extend the teaching activities to young physicians just entering on specialization. Home study courses are being prepared for any of these young men who wish to take them and their work will be supervised by members of the academy interested in improving the caliber of specialists in practice.

INTERNATIONAL ASSEMBLY

Inter-State Postgraduate Medical Association of North America

This year's International Assembly of the Inter-State Postgraduate Medical Association of North America will be held in the Public Auditorium, Cleveland, Ohio, October 14, 15, 16, 17 and 18.

The high standing of the medical profession of Cleveland, combined with the unusual clinical facilities of its great hospitals and excellent hotel accommodations, make this city an ideal place in which to hold the Assembly.

The Academy of Medicine of Cleveland and the Cuyahoga County Medical Society will be host to the Assembly and have arranged an excellent list of committees who will function throughout the Assembly.

The officers of the Inter-State Postgraduate Medical Association, those of the Academy of Medicine of Cleveland and the Cuyahoga County Medical Society, and the Ohio State Medical Association, extend a very cordial invitation to all members of the profession in good standing to attend the Assembly.

The members of the profession are urged to bring their ladies with them as a very excellent program is being arranged for their benefit by the Ladies' Committee.

A full program of scientific and clinical sessions will take place each day and evening of the Assembly, starting at 8:00 o'clock in the morning.

In coöperation with the Academy of Medicine and the Cuyahoga County Medical Society, the Ohio State Medical Association and the Cleveland Convention Board and Chamber of Commerce, a most excellent opportunity for an intensive week of postgraduate medical instruction is offered by in the neighborhood of eighty distinguished teachers and clinicians from different parts of the United States and Canada who are honoring the Assembly by contributing to the program. The speakers and subjects have been carefully selected by the program committee.

Pre-assembly and post-assembly clinics will be conducted, free of charge, in the Cleveland Hospitals on the Saturdays previous and following the Assembly for visiting members of the profession.

Excellent scientific and commercial exhibits of great interest to the medical profession will be an important part of the Assembly. These exhibits will be open to members of the medical profession in good standing without paying the registration fee.

The registration fee for the scientific and clinical sessions will be $5.00.

Members of the profession who can possibly arrange to attend the Assembly cannot afford to miss it.

With a great deal of pride and satisfaction, we call your attention to the list of distinguished teachers and clinicians who are to take part on the program and whose names appear on the second page of the rear advertising section of this journal.

Dr. Chevalier Jackson, President,
Philadelphia, Pa.

Dr. George W. Crile, Chairman, Program
Committee, Cleveland, Ohio.

Dr. William B. Peck, Managing-Director,
Freeport, Ill.

Dr. William M. Skipp, President,
Ohio State Medical Association, Youngstown, Ohio.

Dr. Charles T. Way, President,
Academy of Medicine of Cleveland and
Cuyahoga County Medical Society, Cleveland, Ohio.

Dr. A. Carlton Ernstene, Secretary,
Academy of Medicine of Cleveland and
Cuyahoga County Medical Society, Cleveland, Ohio.

Dr. Hubert C. King, General Chairman,
Cleveland Committees, Cleveland, Ohio.

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Small country-town hospital for sale or rent. Large territory which provides good income. 40 rooms; 8-room apartment, doctor's office, surgery, laboratory, X-ray room, kitchen, laundry; convenient in every way. Badly in need of physician. Address Box 683 care of this office.

DOCTOR WANTED

Young doctor for general practice in county seat town in southwestern part of North Dakota. Large trade territory and fair crops. Town never before was without a doctor. Former doctor was called back to army. For further information call on or write to Carson Commercial Club, Carson, No. Dak.

EXCEPTIONAL OPPORTUNITY

for beginning or established physician to share suite of offices with another physician or dentist. Individual treatment room or laboratory, in new office building located in very best residential retail section. Address Box 653, care this office.

FOR SALE

Medical and surgical instruments and office equipment of the late Dr. J. O. F. Kraushaar, Aberdeen, South Dakota, for fraction of cost. Will include practice and case records covering 30 years. Present location obtainable. Good hospital. Population 18,000; large surrounding territory. Knowledge of German an asset but not essential. Address Mrs. J. O. F. Kraushaar, Aberdeen, S. D.

PHYSICIAN WANTED

Recent graduate, German Catholic and one with a preference for medicine preferred, as an associate in general practice with small hospital in central Minnesota. Opportunity to buy part and later take over entire practice or will sell entire practice. Address Box 684, care of this office.

The JOURNAL LANCET

Minneapolis, Minnesota
September, 1940

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New Series

Transactions of the North Dakota State Medical Association

Fifty-Third Annual Session
Minot, North Dakota
May 6, 7, 8, 1940

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**Deceased*

PROCEEDINGS
of the
HOUSE OF DELEGATES
FIFTY-THIRD ANNUAL MEETING
of the
NORTH DAKOTA STATE MEDICAL ASSOCIATION

Minot, North Dakota

Monday, May 6, 1940

The first session of the House of Delegates was called to order by the President, Dr. H. A. Brandes, at 9:45 A. M., Monday, May 6, 1940, in the Masonic Temple, Minot, North Dakota.

Upon roll call, the following officers, councillors, delegates and alternates responded:

Doctors:

H. A. Brandes, Bismarck
A. W. Skelsey, Fargo
A. Carr, Minot
F. W. Fergusson, Kulm
A. E. Spear, Dickinson
G. M. Williamson, Grand Forks
N. O. Ramstad, Bismarck
A. D. McCannel, Minot
F. L. Wicks, Valley City
Chas. MacLachlan, New Rockford
A. C. Fortney, Fargo
P. H. Burton, Fargo
H. W. Miller, Casselton
B. Hughes, Rolla
W. A. Liebeler, Grand Forks
P. H. Woutat, Grand Forks
H. O. Grangaard, Ryder
A. W. Macdonald, Valley City
R. H. Waldschmidt, Bismarck
O. T. Benson, Glen Ullin
C. C. Smith, Mandan
A. P. Nachtwey, Dickinson
H. Van de Erve, Carrington
P. A. Boyum, Harvey

The President declared a quorum present and the House of Delegates duly constituted for the transaction of business.

President BRANDES: Before we proceed I would like to make a few preliminary remarks. All of you have a program, and you who were delegates and councillors last year will remember that the business of the meeting was completed on the first day. I hope it will be possible this year to follow the same plan as last year. If we can do that, it will give the Delegates an opportunity to attend the full Scientific Program. If we don't, it means they will be taken away from the Scientific Program and that isn't just as it should be. So if you approve of the method adopted last year, we will try to get through with the work of the Society today. Now, in order that all business that comes before us is properly considered, I think it will be necessary for us to appoint one or two additional committees. Last year we had a Reference Committee and we had one the year before, which helped out in transacting the business of the Society. If that meets with your approval, we will follow the same procedure this year. In addition to the Reference Committee, I would like to have the approval of the House of Delegates to appoint two new Committees. You will note that there is a special report coming from the Council which covers some very important business, particularly in relation to the Secretary's office. This item is important to the future of this Society and I think that it should go to a separate committee. If there is no objection, I shall appoint a committee to consider this special report from the Councillors.

Revision of our Constitution and By-Laws comes up for your consideration also. If there is no objection, I will appoint a committee on revision of the Constitution and By-Laws. I think we can handle these matters a little better if they are considered first by a committee before which the controversial issues can be threshed out. Every Delegate has the privilege of appearing before the Committees and every member of the State Association has this privilege.

First, I want to call your attention to our tentative schedule which I think may perhaps help the Delegates. The schedule conforms to the plan we followed last year and to our Constitution, except that the report of the Nominating Committee is scheduled for the second session of the House of Delegates. The Constitution specifies that this Committee shall report on the second day. That, of course, means you would have to meet tomorrow to receive the report of the Nominating Committee, and to act upon it. Last year the report of the Nominating Committee was received on the first day at the second session of the House of Delegates. What action does the House of Delegates desire to take regarding the time for receiving the report of the Nominating Committee? Personally, I would like to get all of our work finished today.

Dr. WILLIAMSON: I would suggest if it is necessary to have it changed, that it read on the evening of the first day.

President BRANDES: If the House approves, we will make that change.

A motion was made by Dr. Williamson, approving the suggestion of receiving the report of the Nominating Committee at the second session of the House of Delegates.

The motion was seconded and prevailed unanimously.

On motion, duly seconded and carried, the Transactions of the annual meeting, May, 1939, as contained in the JOURNAL-LANCET for August, 1939, were accepted as printed.

Secretary Skelsey read the following report:

The Annual Report of the Secretary

Our membership for the fiscal period ending December 31, 1939, was 403. For the current year up to May 4th, inclusive, it is 348. Some remittances were received after the Treasurer had closed his books; but the latest figures are given here, that the House may know the complete response as regards the new rate of $10.00 per capita.

So far as the medical profession is concerned, some of the outstanding events have been:

The vigorous attacks by the federal government, terminating in the suit filed and being continued against the American Medical Association, charged as an alleged monopolistic corporation, to the great detriment of public welfare; also that said Association determines the policies wrongfully used by the Association's subsidiaries. The suit was probably in part due to the procedure adopted by the Medical Society of the District of Columbia, disciplining members engaged in unethical practices. Nor should we forget the recent diatribe against our national headquarters by Congressman Lemke of North Dakota, as spread through Macfadden's *Physical Culture*, that magazine of beautiful forms.

A somewhat similar attitude by a percentage of the public. Nor within our own ranks are we entirely free from drastic criticism.

The new Platform of the American Medical Association, now carried each week in the editorial column of its *Journal*.

The far-reaching plans of the Federal and state governments, evidenced by such national bills as introduced by Senator Wagner and others; and in very many respects backed by women enthused with social welfare aims.

The innovation by some state medical societies, through acceptance from federal-state agencies cash donations, to be utilized by certain local doctors for short-term postgraduate courses. While the plan started with one subject only, already additional money is being contributed for varying subjects. Out from the conservative ranks comes apprehension that this type of coöperation spells state medicine, with federal-state interference and dictation.

The endeavors by various state medical bodies to formulate procedures whereby governmental agencies exclusively must take care of the medical needs of the indigent and the border-line persons.

North Dakota's own peculiar condition, economically, with its apparent need for governmental aid in certain areas. This phase will be covered by your Committee on Medical Economics. For some unknown reason there has arisen, outside of North Dakota, the belief that we have quite happily solved the relationship between our profession and the Farm Security Administration; and inquiries for facts have been numerous.

Efforts of varying degree by the medical profession, offering rebuttals to the attacks against the physicians and Chicago headquarters.

COMMENTS

A new organization for rebuttal and action, the National Physicians' Committee for the Extension of Medical Services, is actively in the national field. You will be privileged, in our general sessions this week, to have its representative discuss these problems.

An eastern newspaper of April 21, 1940, carries an account of a conflict between members of the Medical Society of the County of New York; and plays the affair up as "gag-law," etc. This is a controversy by the liberals demanding a proposed amendment to the by-laws and constitution of the State Medical Society, and the discussion will come before the State House of Delegates May 6 to 8. In this article, reference is had to the "Committee of Physicians," a dissident body within the Society organized a few years ago by a number of prominent doctors; and reference also is made to that National Physicians' Committee, whose representative we have with us this week, and who can give us valuable information.

Since the unusual, special meeting of the House of Delegates of the American Medical Association held in Chicago a few years ago, a number of state medical bodies have introduced plans concerning medical relief, to be handled through the state and the local societies. Doubtless due to the vituperative attacks upon the profession, many doctors are coming more than ever into the belief that they must abandon the older system of giving freely to all, of time and abilities; and that hereafter the government must take care of the indigent and the subsistence cases; although preferably there should *not* be adopted the evils of the contract system, with its demeaning, indiscriminate bargaining.

In order to perfect measures looking to such a modified plan, to be under the control of the state and the local medical societies, definite legal procedures have been followed, especially in states where there exist laws prohibiting what is termed the corporation practice of medicine. Of course there has been, in places, decided opposition, particularly from the cultists. Example, from California: In endeavoring to acquire legal consent for a voluntary health insurance plan, as against a compulsory plan prompted by the state government, the California Physicians' Service, auxiliary to the California State Society, had great opposition.

The Cass County Medical Society has just adopted a new Constitution and By-Laws, and it is understood that other local bodies are contemplating a change. This fact is mentioned here, in case our State Association should become interested in any of the plans now being developed throughout the country.

No details of these endeavors to be given here, beyond noting that they range from a moderate to a much more substantial subscription. Objections to the small-fee system are the all-inclusive benefits which are able to be applied to a person with so high an annual income as from $3,000.00 to $3,600.00.

As regards the separate plans adopted by the hospitals, the current rate of only 65 cents per person per month, irrespective of his or her income, appears too liberal. However, the hospitals in many areas claim that it helps the institutions financially, and also makes the public "health conscious," which is of course an argument with a double accent.

The Detroit (Michigan) *Medical News* is a most excellent weekly publication. Anticipating that I have its consent I quote here an editorial from its issue of April 15, 1940. (The H. Cabot referred to is doubtless the Dr. Cabot, formerly of the Mayo Foundation, but who is now back in Boston.)

"H. CABOT SPEAKS

"Medicine is in a ferment. Something is wrong. When Mr. Jones, who makes forty-five a week, and has an abhorrence of charity, gets sick, he is out of luck, and so are Mrs. Jones and the children. Give Jones a break. So says H. Cabot in the *American Magazine*, April issue.

"Yes, Mr. Jones is improvident. But it is human to be improvident. He cheerfully pays hundreds of dollars in concealed commissions to the salesmen of everything he buys from automobiles to zithers . . . most of his money is swallowed by intangibles. Ah yes. Life is rich, warm and sweet.

"But when any of the Jones family is sick, there is a great hullabaloo. Mr. Jones finds that he cannot afford medical care, and this, says H. Cabot, is largely due to the rapacity of the doctors.

"H. Cabot admits that in his earlier years he lined his pockets by overcharging the sick people who came to his office, and since that time he has not felt right behind his breast-bone. As a penance and to help Jones he suggests that physicians be organized into prepayment medical groups, such as the Blue Cross group he has sponsored in Boston, and that they be paid from three thousand to ten thousand dollars per year for their services, depending presumably upon the condition of the 'kitty'. That this salary scheme throws some of the doctors into the semi-indigent category along with Jones is of little moment, for it is Jones who must be helped, and Jones is eligible for the Blue Cross Service even if he earns thirty-five hundred dollars a year. *Besides*, the *doctor's wife can work*.

"Coming from a man who has made an enviable record in American medicine, Dr. Cabot's pronouncements cannot be dismissed with a fillip. The vast majority of honest and honorable practitioners of medicine do find it impossible to salt away even a thousand dollars a year. But that is not a problem. The problem is how best to help Mr. Jones without lowering the standards of practice, and to this problem organized medicine during the past ten years has given much serious thought and action, fully aware that the pressure of society can become a fearfully destructive thing.

"After all is said and done, prepayment medical plans and many of the insurance schemes that all have been hatched to provide for the improvident, are still in the developmental stage, and if not carefully handled may result in lowering rather than elevating the standards of practice."

Finally, Concerning Rebuttals

As to the theory that the Aesculapians should emphatically refute, through the press and from the rostrum, the persistent fusilade against them, we can, or should, realize that in the zeal to protect the "chastity" and the ability of our profession, physicians may utter or write statements which can assume a serio-comic aspect. Example: There is now on the screen, enroute to Benighted North Dakota, a movie entitled "The Fight for Life," whereon is said to be amazingly depicted the gruesome afflictions and inflictions of those maternity cases improperly cared for by the medics. We may (or may not) admit that some good results can follow the showing; but we can also well conjecture that the author and the producers had chiefly in mind the expected inflow of shekels, as it is highly improbable that producers put out upon the public screen material without expecting a large financial reward.

In the New York *Times* of March 17, 1940, Dr. Max Schneider, secretary special committee on maternal welfare, Medical Society of the County of New York, took exception to some language found in that newspaper on March 7, covering a review of "The Fight for Life," i. e., the glaring falsehood *that hundreds of thousands* of mothers and infants died needlessly each year, etc., etc. The newspaper publishers, quite evidently with a keen mind and eye for its advertising value, turned the communication over to Pare Lorentz, who replied right alongside a flaring advertisement of the film. And Lorentz did get in this clever rejoinder:

> "As to his remark (Schneider's) that 99 per cent of the cases will *not* require the services of a trained obstetrician, this is exactly the attitude of mind which has made obstetrics the lowest form of medical service in America today, the cause of so much unnecessary loss of maternal and infant life or the crippling of thousands of mothers, . . . and the chief reason why we made this picture."

This is "strong meat" for the public, always avid for sensationalism. We, as doctors, appreciate what Dr. Schneider was hoping to prove, in regard to the usually physiological processes, and the facts he wanted to impress upon the readers. Here, then, was a newspaper, with a daily circulation of well over half a million, to help carry the message. Did the public believe the doctor or the commercialized propaganda?

Respectfully submitted,

Albert W. Skelsey, M.D.

. . . . . .

President Brandes: The Secretary's report will be received and referred to the Reference Committee for consideration. I shall appoint that Committee at this time.

Reference Committee: Dr. W. A. Liebeler, chairman; Dr. A. L. Cameron, Dr. R. H. Waldschmidt, Dr. F. L. Wicks, Dr. Simon Melzer, Dr. B. Hughes, Dr. W. A. Wright.

Dr. N. O. Ramstad, Chairman of the Council, read the following report:

Report of the Chairman of the Council to the House of Delegates

It gives me great pleasure to report to the House of Delegates the activities of the Council for the past year.

At the state meeting last year two sessions of the Council were held. The treasurer's report was audited and approved. Mr. Cohen of the Journal-Lancet appeared before the Council and reviewed the relations of our state medical association with the Journal-Lancet. The Council renewed our agreement with the Journal-Lancet for a period of three years.

A committee of two was appointed to assist the Secretary of the Association in editing our proceedings in the Journal-Lancet. Dr. MacGregor and Dr. Williamson were appointed. The present editorial committee of the Journal-Lancet was reappointed for another year.

It was decided that the Secretary of the State Association receive a salary of $600.00 per year and $100.00 for use as chairman of the Radio Committee during the coming year.

After careful consideration of the finances of the Association, the Council decided unanimously that it was impossible to employ a full-time secretary for the ensuing year.

A motion was made and carried that the minutes of the Council for the year be not published.

The officers elected for the ensuing year were: N. O. Ramstad, chairman; G. M. Williamson, secretary.

Last January, Dr. H. A. Brandes, president of the North Dakota State Medical Association, requested a special meeting of the Council to consider various problems which demanded attention before the next annual session of the House of Delegates in May, 1940.

This meeting was held in Fargo, January 12, 1940, and consisted of a joint meeting with the following officers of our Association: Dr. H. A. Brandes, president; Dr. C. J. Glaspel, president-elect; Dr. F. W. Fergusson, vice-president; Dr. A. W. Skelsey, secretary; Dr. W. W. Wood, treasurer; Dr. W. C. Fawcett, chairman of the Committee on New Constitution and By-Laws, in addition to the following Councillors: Drs. A. E. Spear, F. W. Fergusson, F. L. Wicks, M. MacGregor, P. G. Arzt, Charles MacLachlan, and N. O. Ramstad. Dr. George M. Williamson, secretary, was prevented by illness from attending.

Dr. Wood, our treasurer, gave a report of the condition of the finances of the Association in order that we might consider the employment of a full-time secretary, which was based on the action taken by the House of Delegates at the annual meeting in Fargo, in May, 1939.

The state president, Dr. Brandes, discussed the problems which he believed should be considered at this meeting. He urged consideration of the following points:

1. Closer union between the state association and its component societies.
2. Endeavor to bring about increased respect and confidence in the organized medical profession through the press, the radio, public speakers, etc.
3. Planning measures to make our organization felt in public affairs.

He discussed the relative value of some of our state committees. Are they properly instructed and do they really function? Do they have funds with which to carry on their activities? Should the state secretary supervise their activities more closely? He mentioned the apparent conflict between our committees and the system proposed by various federal bodies in the control of venereal disease, pneumonia, tuberculosis, etc. He believes that the State Health Department and the Federal Health Department may make plans concerning the control of heart disease, cancer and diabetes.

Dr. Brandes discussed the reorganization of the office of secretary. He believes that it would be advantageous to have the office located in Bismarck, the capital of the state, in order that the secretary would be in close contact with federal and state agencies charged with health activities.

The officers of your society and the Council discussed these recommendations and especially the problem of a full-time secretary for the state association. An attempt was made to estimate, first, the total amount necessary to cover the cost of a full-time secretary in addition to office rental, clerical hire, travel, postal expense, etc.; second, the cost of a part-time secretary and more clerical help in order that increased service could be given the association.

After due consideration, the chairman of the Council was instructed to confer with the treasurer and the secretary and submit two proposed budgets to the House of Delegates, one for a full-time secretary and the other for a part-time secretary. Copies of these estimates will be passed among you for your consideration.

The Council, after considerable discussion and a conference with your state officers, decided that under the present circumstances we are unable to employ a full-time secretary because of inadequate financial support.

In regard to the Radio Program activities, Dr. Brandes presented a communication from Dr. A. C. Fortney, chairman of the Committee on Radio. This report requested some changes of the rules and regulations previously adopted by the House of Delegates in order that the Radio Committee might function effectively. He also advised that the Radio Committee should have an appropriation for expenses.

The report of the Radio Committee was considered and was recommended favorably to the House of Delegates.

The Council adopted a plan of having semi-annual meetings in order that the work of the annual session could be expedited and urgent matters attended to.

A resolution from the Sheyenne Valley Medical Society was received which protested against the members of the association entering into agreements with the Fraternal Order of Eagles for a system of contract practice. Dr. Wicks, councillor from Valley City, stated that the resolution was mainly a warning to the members of his society (Sheyenne Valley) inasmuch as the physician in the society who had accepted the contract work with the Eagles is now deceased. The Council approved the action of the Sheyenne Valley Society in issuing this resolution, condemning contract practice with the Fraternal Order of Eagles.

A communication from the Northwest Clinic at Minot to the American Medical Association was received from the American Medical Association for action by the Council. It requested a ruling as to the ethics of a plan proposed by the pediatrician of that clinic to inaugurate a Well-baby Care Plan at the rate of $25.00 annually. The Council decided to notify the business manager of the clinic suggesting that he first confer with the Northwest Medical Society at Minot for its decision in this matter.

A communication was received from the North Dakota Federation of State Associations requesting a remittance of $25.00, annual dues for 1940. The bill was allowed as the Council felt that this connection was of considerable value to our state organization.

The proposed new Constitution and By-Laws were considered by the officers and the Council. A report recommending some modifications was received from the Sixth District Medical Society. The Council approved the new Constitution with these modifications.

The question of Farm Security Administration and medical relief was brought before the Council through recommendations of Dr. Wright, chairman of the Economics Committee. A prolonged discussion of this topic took place which was based on a review of the answers from the local societies regarding the merits of the unit system proposed by the federal authorities.

In view of the conflicting returns from the different societies, the serious nature of the problem, and the ultimatum laid down at the last session of the House of Delegates against the association accepting the unit system, a motion was made and carried that the Farm Security Administration and medical relief problems be referred back to the House of Delegates for their consideration and action as the Council does not consider that it has sufficient authority to act.

Council adjourned.

N. O. RAMSTAD, M.D.,
Chairman.

PRESIDENT BRANDES: There are a number of important matters in the report of Dr. Ramstad, to be considered by the House of Delegates. I shall appoint a special committee to consider the reorganization of the Secretary's office, consisting of the following:

Dr. N. O. Ramstad, chairman; Dr. A. P. Nachtwey, Dr. A. W. MacDonald, Dr. P. H. Burton, Dr. H. Van de Erve, Dr. G. B. Ribble.

PRESIDENT BRANDES: I think it would be well to spend five or ten minutes at this time, if there are any of the delegates who wish to discuss this matter of reorganization of the Secretary's office. I think that this is an important matter and should be given careful consideration. We can not spend too much time on it now, but if there are any delegates who have any further questions to ask or further recommendations to make on this subject, we will be glad to hear from them. If there is no further discussion, I ask that you meet with the committee when it goes into session, and go over this matter with them.

DR. WILLIAMSON: If any of you men have any questions to ask about annual registration, and where the money is spent, I want to give you an opportunity to ask those questions. I want to show you how I keep the account and take care of this money, and whenever convenient I want an opportunity to do that, and I want every delegate to ask any kind of a question he wishes to ask.

PRESIDENT BRANDES: I know that that question has come up in some of our societies. This is the time to ask questions regarding the registration fees.

DR. BURTON: I understand that Dr. Ramstad is one of the fellows who wants a full-time secretary, and I would like to have him tell the House of Delegates why we should have a full-time secretary. I would like to hear from Dr. Ramstad on the subject. They tell me he is the father of this full-time secretary.

DR. RAMSTAD: That honor is misplaced. My suggestion would be that this discussion be deferred until the committee has acted on that matter. The chairman has just appointed a committee, of which I am unfortunately a member, and I think the House of Delegates should await the action of this committee, which meets this afternoon, and if that meets with your approval, I ask that you wait.

DR. MACLACHLAN: I think it would be a very good thing if we were advised here what the total receipts for the year are and briefly state what the expenses of the year are under our present system as it was explained to us.

PRESIDENT BRANDES: I might say to Dr. Burton, that Dr. Ramstad does not happen to be the father of that idea. Is there anyone else who wishes to present anything to this committee? I will announce the time and place where the committee will meet. I hope you will meet with this committee this afternoon to get this threshed out so you won't spend too much time on it this evening.

The Treasurer's Report of Dr. W. W. Wood, was read by Secretary Skelsey and referred to the Council.

PRESIDENT BRANDES: At this time we will hear from the Councillors.

REPORTS OF COUNCILLORS

First District

Secretary Skelsey read the report of Dr. Murdock MacGregor as follows:

Cass County Medical Society has 63 active members. During the past year seven regular meetings have been held with an average attendance of 35. All our programs have been put on by the local membership, excepting one, when we were entertained by the Physicians of the Veterans Facility in Fargo. All the papers presented at the society meetings were well prepared and presented, and it was quite evident much time and thought were behind their preparation.

A new Constitution and By-Laws has been adopted by Cass County Society which provides that applicants for active membership must serve a year of probation before attaining full membership. It is hoped that this provision may serve to eliminate those who might prove undesirable.

A Hospital Service plan has been organized by the hospitals in Fargo. The Society took no part in its organization but voted its approval when presented to them.

Respectfully submitted,
MURDOCK MACGREGOR, M.D.,
Councillor.

Second District

Secretary Skelsey read the report of Dr. G. F. Drew as follows:

The Devils Lake District Medical Society has held five meetings during the past year, with very good attendance. Most of the interest centered around the economic situation which concerned the fees for work done for the Welfare Boards, especially those boards which were prorating bills without consulting the doctors or the society. The discussions culminated in the following resolution passed at the April meeting.

> RESOLUTION: That this Society go on record as refusing to accept anything lower than the State Welfare Board Schedule for work done after July 1, 1940, unless all other bills against the county be prorated in the same manner as those for medical services.

A copy of this resolution with the names of all members and signed by the president and secretary in our district was sent to each Board of County Commissioners and it seems some new and more reasonable arrangement will have to be made for work done after July 1, 1940. We hope other societies will make some similar effort in order to get a uniform, reasonable and workable basis and that our bills will be honored the same as all other bills are at present.

We have the same number of members as for 1939, having lost one on account of the increased State fee, and taken in one new member, and one membership now pending.

At our last meeting we decided to send $1.00 for each member to the Committee of American Medical Association for work they are doing and the fight they are making for the Association. Yours truly,

(Signed) G. F. Drew, M.D.,
Councillor.

Third District

Dr. G. M. Williamson read the following Councillor's report of the Third District:

During the past year the Grand Forks District Medical Society held eight meetings, all well attended.

Our Society has an active, energetic group of officers who endeavor to furnish programs of an interesting character on subjects that appeal to the entire membership. Five programs were by guest speakers from Duluth, St. Paul and Minneapolis. Our first meeting of the year is always at Grafton, and we had as guest speaker, a member of our State Association, Dr. A. L. Cameron, who gave an interesting talk on "Problems of Blood Transfusion," which was enjoyed and appreciated by a large group of our members.

I feel that exchange programs between different District Societies in our own state might be arranged to advantage. Local problems and mutual understandings pertaining to affairs in our State Society could be more widely discussed.

In my experience as secretary of the Board of Medical Examiners, I find an increasing need of more help and a keener interest by the members of our profession throughout the state in problems which are found in each district. The irregular practitioner or "healer" is always with us, it is common knowledge to every licensed physician in the state. It is a difficult problem to make them obey the law, the chief reason is lack of help and coöperation on the part of regular licensed men throughout the state and the indifference and reluctance of law enforcement officers in many counties. I mention this in order that it may provoke discussion of this problem.

There are 72 men licensed in this district, four of this number are Honorary Life Members: Dr. C. B. Harris, Pembina; Dr. James Grassick, Grand Forks; Dr. F. N. Burrows, Bathgate, and Dr. G. W. Glaspel, Grafton.

To date 59 have paid their annual dues. Nine others, some of whom may belong to Devils Lake or Traill-Steele districts have not reported to notices sent by our secretary.

We have lost three by death, namely, Dr. Henry O'Keefe, Dr. Olaf Bentzen, and Dr. J. P. Miller, all these men were highly esteemed, ethical and honorable members of our profession.

G. M. Williamson, M.D.,
Councillor.

Fourth District

Dr. A. D. McCannel read the following Councillor's report of the Fourth District:

The district had 58 members on June 1, 1939. We have taken in 5 new members, making 63 in good standing at present.

During the year we have had eleven meetings, all very well attended. Two of them were held at the Minot Country Club, where we enjoyed wonderful meals prepared by one of our members, Dr. Frank Wheelon. Our meetings are held alternately at the two hospitals.

The scientific meetings have been very interesting. They included the following programs, in addition to the regular programs:

1. Motion pictures and discussions of the treatment of pneumonia.
2. Motion pictures and discussion of the use and value of cardiographs.
3. Motion pictures on the proper handling of obstetrical cases.
4. Discussion of Obstetrics and Pediatrics, by Dr. Moe of Duluth and Dr. Stoesser of Minneapolis.

At our meetings the question of Economics and the FMAC were discussed. The members voted against any participation in the medical program as proposed by the F.S.A.

We have two Honorary Members, Dr. Andrew Carr and Dr. Timm.

Archie D. McCannel, M.D.,
Councillor.

Fifth District

Dr. Skelsey read the report of Dr. F. L. Wicks, Councillor of the Fifth District:

The Sheyenne Valley Medical Society has a membership of thirteen. The society suffered irreparable losses by the deaths of Drs. E. A. Pray; Will H. Moore, and S. A. Zimmerman.

Our membership has been increased by three during the year—this by the affiliation of Dr. R. G. White and Dr. Paul Cook of Valley City and Dr. S. A. Nesse of Nome.

Five meetings have been held, these to consider economics, fraternal medical insurance; the program of the National Physicians Committee and other matters of local interest.

As a part of the program of our State Committee on Maternal and Child Welfare, an extension course was held on obstetrics and pediatrics at Valley City. Visiting clinicians were Drs. Stoesser of the University of Minnesota and R. J. Moe of Duluth. The course was well attended and interesting.

Two of our members, Dr. R. G. White of Valley City and Dr. M. D. Westley of Cooperstown, attended recent graduate courses at the Center for Continuation Study at the University of Minnesota.

Officers elected at our annual meeting, held January 30, are as follows: Dr. A. C. MacDonald, president; Dr. J. Van Houten, vice-president; Dr. C. J. Meredith, secretary-treasurer; Dr. A. W. MacDonald, delegate; Dr. Wm. Campbell, alternate.

Respectfully submitted,

F. L. Wicks, M.D.,
Councillor.

Sixth District

Dr. N. O. Ramstad read the following Councillor's report of the Sixth District:

The Sixth District Medical Society has held four meetings during the past year with an average attendance of 39 members. During the year we also had 15 guests at our meetings.

There are 64 paid-up members. Two members have left the state, one member has retired, and another is critically ill and has not paid his dues.

The following transfers have been made: Dr. Gunder Christianson to the Traill-Steele County Society; Dr. Theodore Stransky to the Minnesota Medical Association.

Dr. J. H. Barthell at Hazen has been admitted as a new member.

Guest speakers during the year have been: Dr. Bertram S. Adams of Hibbing, Minnesota, who discussed fractures; Drs. A. L. Cameron and P. J. Breslich of Minot who read papers on blood transfusion; Dr. M. T. Lampert of Minot who read a paper on carcinoma of the larynx.

An active interest has been maintained by the members of our society during the past year.

N. O. Ramstad, M.D.,
Councillor.

Seventh District

Dr. Skelsey read the report of Dr. P. G. Arzt, Councillor of the Seventh District:

It is a pleasure to report the activities for the year 1939 of the Stutsman County Medical Society.

The society enjoys a membership of twenty-two at the present time. During the year three men have moved away and two members have been admitted. It has been the custom of the society to precede their deliberations with a good dinner. This seems to increase the feeling of camaraderie and good fellowship and makes for a much better and much more interesting meeting.

There have been six regular meetings with an average attendance of seventeen, one substitute meeting and one special meeting.

The following speakers and their subjects are listed: Dr. Long, Fargo, "Common Cardiac Disorders." Dr. Rucker, Mayo Clinic, spoke on "Headache in Diagnosis of Diseases." Dr. Wall, Minot, "The Use of X-Ray in Diagnosis." Dr. Ralph Pray, Fargo, "Stoesser Method of Care of Prematures." Dr. Malcolm Dockerty, Mayo Clinic, "Ovarian Neo-Plasms." Dr. Joel Swanson, Fargo, "Treatment of Fractures."

The substitute meeting was a one-day refresher course on Maternal and Child Welfare. Dr. Stoesser of Minneapolis and Dr. Moe of Duluth gave two splendid educational ad-

dresses in the field of Pediatrics and Obstetrics. Unfortunately, these meetings were very poorly attended.

The special meeting was called for the purpose of debate and action as to the continuance of the FMAC program. The opinion was, that it would be politic to continue the present set-up until the expiration of the agreement. After that it was definitely agreed that no further agreement would be entered into with the FMAC at any future time. I might say that the morale of the constituent members has been markedly enhanced since the elimination of this agreement.

The society has actively supported financially and otherwise the activity of the National Physicians Committee, many members having subscribed individually.

A Spencer projectoscope was purchased during the year. This, with the film projector, gives the society a very good layout, making it possible for a speaker to present his subject along any line selected.

The officers for the ensuing year are: Dr. R. D. Nierling, president; Dr. George Holt, vice-president; Dr. Bertha Brainard, secretary-treasurer; Dr. S. W. Melzer, delegate; Dr. Joseph Sorkness, alternate.

The society is rather small but what they lack in number, they more than make up by their activities as evidenced by the yearly programs presented.

Respectfully submitted,

P. G. ARZT, M.D.,
Councillor.

Eighth District

Dr. F. W. Fergusson read the following Councillor's report of the Eighth District:

The Southern District Medical Society has a membership of eight. There are two men in the district who are not members.

There have been four meetings during the past year with average attendance. A number of the men have attended meetings in neighboring districts.

The present officers are: Dr. H. J. Meunier, Oakes, president; Dr. E. E. Wolfe, Oakes, secretary-treasurer.

F. W. FERGUSSON, M.D.,
Councillor.

Ninth District

Dr. Skelsey read the report of Dr. H. Van de Erve, Councillor of the Ninth District:

Four meetings were held in the past year, with an average attendance of ten, out of a total membership of fourteen. The first was held at New Rockford August 30. Two were at Fessenden, November 8 and December 14, and the fourth at Harvey, April 11. Our membership has been increased by the transfer of Dr. E. J. Schwinghammer from Grenora to New Rockford.

Five visitors have attended the meetings, two of them local dentists, the others members of sister society units.

One member attended the postgraduate course in obstetrics and pediatrics held in Minneapolis.

No papers on medical subjects have been presented, though Dr. MacLachlan presented an account of incidents which have occurred during fifty years of practice. A number of interesting clinical cases, with histories, were shown, provoking animated discussions.

All regularly qualified physicians living within the area of the Tri-County Society are members of this or of a component unit, and professional harmony prevails amongst its members.

The August tenth meeting at New Rockford was made the occasion of presentation to Dr. MacLachlan of a fine Kenwoodie pipe, accompanied by an address of felicitations. He was one of the founders of the society, its first president, and enjoys the distinguished honor of having been president of the State Association and half a dozen times its delegate to the annual meeting of the American Medical Association. At a later meeting the society passed unanimously a resolution conferring life membership on him, in conformance with the parent body's customary course in such cases.

Dr. MacLachlan, attending a meeting of the councillors in Fargo last January, presented a report of the action there taken by the council, functioning as an advisory body, on the proposal for adoption of a new constitution and by-laws with the proposed amendments, with the recommendation of the Council to the society units for deliberation and action. This report and amendments were by resolution unanimously approved April 11, 1940.

Officers: Dr. L. J. Seibel, Harvey, president; Dr. A. Donker, Carrington, vice-president; Dr. C. G. Owens, New Rockford, secretary; Dr. H. Van de Erve, Carrington, delegate; Dr. P. A. Boyum, Harvey, alternate.

H. VAN DE ERVE, M.D.,
Councillor.

Tenth District

Dr. A. E. Spear read the following Councillor's report of the Tenth District:

We have, this year, twenty-three members in good standing, having lost five members and having only one new member.

We regret deeply the loss by death of two very loyal and most likable members. Dr. I. M. Law of Halliday died in January of this year, and Dr. V. G. Morris of Beach died April 15th.

Dr. F. J. Cornelius of Bowman has moved to Olympia, Wash., where he is engaged in the practice of medicine although he still retains his membership in the Southwestern District Society.

Dr. Lemieux of Stanley has transferred to the Northwestern District Society.

Dr. Fred Hamernek of Elbowoods has been transferred to Montana.

Our new member, Dr. E. L. Bloedau of Bowman, has been admitted to the Society after a probation period of a year. The application of Dr. Virgil Parrott of Beach is still on the table for future disposal.

We have had five meetings during the year and the attendance has been very good, averaging twenty members per meeting, with the exception of one meeting. At this meeting, just mentioned, called for December 2, 1939, due to severe weather and impassable roads, we failed to have a quorum.

The postgraduate lectures in obstetrics and pediatrics of Dr. Russell J. Moe of Duluth and Dr. Albert V. Stoesser of Minneapolis were very well attended and much enjoyed.

Very fine spirit of coöperation and good fellowship has prevailed throughout the year and much interest has been shown in both the scientific programs and medical economic problems.

Respectfully submitted,

A. E. SPEAR, M.D.,
Councillor.

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President BRANDES: We will now have the report from Dr. A. P. Nachtwey, our delegate to the American Medical Association:

Dr. NACHTWEY: The American Medical Association held its 90th Annual Session in St. Louis, May 15-19. The outstanding event at the meeting of the House of Delegates, was without doubt the consideration, final report and adoption of the same without a dissenting vote by the House of Delegates, of the Wagner Bill. A special committee of five was appointed to study all matters introduced pertaining to the Wagner Act. This special committee devoted some fifteen hours, in three meetings, considering recommendations concerning the Bill.

Most of you have undoubtedly read the report which is published not only in the *Journal of the American Medical Association* but in many other medical magazines and daily papers, so I will stress only a few of the most important points and emphasize a few of the high-lights that were given by the Reference Committee to the House of Delegates:

1. The Wagner Health Bill does not recognize either the spirit or the text of the resolutions adopted by the House of Delegates of the American Medical Association September 27, 1938.
2. The Wagner Health Bill does not safeguard in any way the continued existence of the private practitioners who have always brought to the people the benefits of scientific research and treatment.
3. The Wagner Health Bill does not provide for the use of the thousands of vacant beds now available in the hundreds of Church and Community general hospitals.
4. The Bill proposes to make Federal Aid for medical care the rule rather than the exception.
5. The Wagner Health Bill insidiously promises development of a complete system of tax-supported governmental medical care.

6. The Wagner Health Bill provides for supreme federal control; federal agents are given authority to disapprove plans proposed by the individual states.
7. The bill is inconsistent with the fundamental principles of medical care established by scientific medical experience and is therefore contrary to the best interests of the American people.
8. The House of Delegates would urge the development of a mechanism for meeting the needs for expansion of preventive medical service, expansion of medical care for the indigent with local determination of needs and local control of administration, within the philosophy of the American form of government and without damage to the quality of medical service.
9. Any state in actual need for the prevention of disease, the promotion of health and the care of the sick should be able to obtain such aid in a medical emergency without stimulating every other state to seek and to accept similar aid, and thus to have imposed on it the burden of federal control.

Closely related to the controversy over the extent of need for governmental participation in medical practice was a report of the committee on the survey of the need for medical care. Dr. W. F. Braasch, Rochester, Minnesota, reporting for the committee, denied that the number of medical needy even approaches the forty million as established by various government agencies which have studied the problem. Dr. Braasch reported to the House of Delegates that replies to questionnaires to physicians and dentists representing a population of forty-three million seven hundred ninety thousand and sixty-eight persons indicate and from the replies received the committee estimates that the number of people in the United States who are denied medical services is forty thousand and not forty million as maintained in the Technical Committee Report before the National Health Conference.

In September, 1938, your delegate attended a special meeting of the House of Delegates of the A. M. A., which was held in Chicago. The principal business taken up at this meeting had to do with the indictment of the A. M. A. by the Federal Government on the charge of conspiracy in restraint of trade. Dr. Irvin Abell, the president of the A. M. A., said the principal point in the indictment of the American Medical Association was determination of where the power of policing professional organizations laid, stating that heretofore it had been left to the organizations to establish standards of qualifications, trading, attainment, character and conduct of members of their ranks. This case is now held under appeal to the Supreme Court of the United States. The attorneys for the American Medical Association state that in their opinion a verdict will be rendered in favor of the A. M. A.

Among the many resolutions offered to the House of Delegates, two resolutions, both emanating from the Medical Society of the State of New York, were introduced. One requested that the House of Delegates grant a seat to a woman delegate. Women have had this privilege since the founding of the society. The other resolution urged that membership in the American Medical Association be not denied solely on the basis of race, color or creed. The constitution of the American Medical Association declares it is to be "a federacy of its constituent associations," membership in which derives solely from membership in component county or district medical societies. The constitution does not attempt to fix standards, other than professional, for membership in local county medical societies. The House of Delegates rejected both these resolutions.

Your delegate appeared before the Reference Committee, which had to do with the activities of the Farm Securities Administration in the field of medical care. Their report was to the effect that it be recommended that there be a better understanding between the state and county medical societies. Agreements made between the county medical societies and the Farm Security Administration should be subject to the approval of the state association.

The addresses by the Speaker of the House of Delegates, the President, and the President-elect have all been printed in the *Journal of the American Medical Association* and I will not take your time in reviewing their remarks.

Inasmuch as this report of your delegate to the American Medical Association is now presented one year from the date of this meeting, it might be interesting to the delegates to know the fate of the Wagner Bill in its present status in the Senate of the United States. The Senate Committee on Education and Labor submitted a preliminary report on the Wagner National Health Bill, approving its general objectives but withholding commitment on its details. The bill is still in committee and will doubtless never be reintroduced in its original form.

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REPORTS OF STANDING COMMITTEES
1940

President Brandes: The next order of business is the reports of the standing committees. The first one listed on our schedule is the Executive Committee. I have no regular report but wish to state that in looking over the Proceedings of 1934, I find that the Executive Committee was appointed for one year. In my opinion the Executive Committee has had no official standing since 1935. No meeting of the Executive Committee was called this year, but a special meeting of the Councillors was held in January and you have heard the report of that meeting as read by Dr. Ramstad.

Committee on Public Policy and Legislation

The North Dakota Legislature has not met since our last annual meeting. Consequently, the work of your Committee on Legislation has amounted to very little during the past year. However, we wish to bring to your attention the need for an interest in, and support of, the program of the National Physicians Committee for the Extension of Medical Service. The National Committee, which is entirely voluntary, is interested in:

1. The extension of adequate medical care to all who need it.
2. The countering of destructive propaganda by familiarizing the public with the facts in connection with the methods and the achievements of American medicine.

The Committee is non-political and is maintained exclusively by voluntary contributions. It is interested primarily in the maintenance of the American system of medical care. It is in a position to render a great service for the public and the profession, and deserves the support of every medical doctor who wants to see the practice of medicine, as he has enjoyed it, passed on to those who will succeed him.

Respectfully submitted,

L. W. Larson, M.D.,
Chairman.

Committee on Cancer Survey

The work of the Committee on Cancer Survey during the past year has been limited entirely to service on the Executive Committee of the North Dakota Women's Field Army for the Control of Cancer. It should be emphasized that the Committee on Cancer Survey constitutes the Executive Committee of the Women's Field Army. The State Commander of the Army is Mrs. J. W. Snyder of Fargo. A meeting of the Executive Committee was held in Fargo in December, 1939, at which time the organization was completed, important officers, such as the treasurer and publicity director, were appointed, and plans for the organization of the state into county units headed by a county captain were perfected. It was deemed advisable that at least one physician serve on each county committee to act not only as a consultant and advisor for the committee, but also as a liaison officer between the medical profession in the state and the Army. These physicians were selected by the Committee, and later, each one was written to, asking that he serve in this capacity. The letter contained statements of endorsement of the program of the Women's Field Army from Dr. Rock Sleyster, president of the American Medical Association, and Dr. Harry Brandes, president of the North Dakota State Medical Association. It is gratifying to report that a large percentage of the physicians who were asked to serve on these county committees have accepted the appointments, and all of the letters received indicate a great interest in the program and a desire to coöperate with the local county committee in every way possible. April was the campaign month designated by the national organization as Cancer Month and was so proclaimed by President Roosevelt and Governor Moses. Mrs. Snyder, the State Commander,

reports that practically every county is well organized and has carried on a program of education and solicitation for membership in the Army.

Your committee believes that the profession should encourage the women of this state to develop a strong unit of the Women's Field Army for the Control of Cancer. Its program of education for the general public will do much toward decreasing the number of hopeless cancer cases, because the early recognition of symptoms and the early diagnosis and treatment of cancer are emphasized. Unfortunately, some of the members of our profession have misunderstood the intent of the Women's Field Army, considering it to be just another milestone in the road to regimented medicine. Nothing could be farther from the truth. Your committee believes that every member of the profession should be aware of the objectives of the Army, and not only assist in the educational program in his community, but also develop a cancer-consciousness, so that patients who come to him for advice will receive the best diagnosis and treatment possible. For this reason, we urge the component societies of our state association to devote at least one meeting a year to the subject of cancer.

Respectfully submitted,

L. W. LARSON, M.D.,
Chairman.

Committee on Pneumonia Control

Last November, Dr. Maysil M. Williams, State Health Officer, requested the president of the North Dakota State Medical Association, to appoint a committee to act in an advisory capacity to the State Department of Health to consider and suggest control activities aimed at the reduction of pneumonia morbidity and mortality in North Dakota. Dr. H. A. Brandes, president, appointed Dr. W. E. G. Lancaster, Dr. F. O. Woodward, Dr. W. H. Gilsdorf, Dr. W. O. Johnson and Dr. L. W. Larson to serve on this committee. A meeting of the committee was held in the Capitol Building in Bismarck on November 20, 1939. Drs. Williams, Cowan and Gillespie and Mr. Koons represented the State Health Department. Statistics presented at the meeting showed that there have been approximately 400 deaths in North Dakota per year from pneumonia and that this disease ranks third as a cause of death in the state. It was thought that this represented about 1200 to 1600 cases of the disease as occurring annually, since the mortality rate before the advent of serum or sulfapyridine treatment was from 25 to 33 per cent. Items discussed at the meeting were:

1. The efficacy of sulfapyridine alone in the treatment of pneumonia.
2. The indications for the use of antipneumococcic serum.
3. The desirability of an accurate typing of the pneumococcus in each case, and the absolute necessity for such a typing in all cases in which serum is to be used.
4. Whether or not sulfapyridine and serum should be furnished free to all persons or limited to those who are medically indigent.
5. The laboratory facilities now existent in the state and methods by which such facilities could be improved and better distributed throughout the state.

After much discussion and with due consideration of the limited amount of money available for the program, it was unanimously agreed that a Pneumonia Control Program should be established by the State Department of Health. A demonstration period of six months, from December 15, 1939, to June 30, 1940, was designated. It was agreed that sulfapyridine and antipneumococcic serum should be furnished free of charge to the medically indigent pneumonia patients through their family physicians. Melvin E. Koons, director of Division of Laboratories, State Department of Health, was directed to designate those clinical laboratories, other than the state laboratories in Bismarck and Grand Forks, which he considered capable of doing pneumococcus typing and other essential laboratory tests. It was decided that each typing station should act as a depot for the distribution of sulfapyridine and serum. Fees for the laboratory work done by the private laboratories, all of which are located in hospitals, were agreed upon.

A communication from the State Department of Health was sent to every doctor in the state on December 19. This explained the program in detail, included a review of the recent accepted literature on the treatment of pneumonia, and a list of twenty-four pneumonia control stations where the typing of the pneumococcus, the determination of the sulfapyridine level in the blood, etc., could be performed. A few days later a representative technician from each laboratory attended a two day course of instruction in one of the State Public Health Laboratories.

A summary of the program for the first three months of its operation reveals some interesting statistics. Pneumonia has always been poorly reported in North Dakota, there being only 214 cases reported in 1937, 343 cases in 1938 and 379 cases in 1939. However, there were 312 cases reported during the first three months of 1940. Of these 312 cases 169, or 54 per cent, were treated under the program. The predominant types of pneumococci found in the sputum submitted during the first three months of 1940 were type I—17.6 per cent, type II—27.8 per cent, and type VII—13 per cent. The remainder were rather evenly distributed between types III, IV, V, VI, XIV, XIX, XXI; 16.7 per cent were found in types other than those mentioned. It is interesting to note that 39 specimens of sputum submitted for typing failed to reveal the pneumococcus. Thirty patients received 1,495,000 units of serum or an average of 49,833 units per patient. One hundred sixty-one patients received 2,753.93 grams of sulfapyridine or an average of 17.2 grams per patient.

It is obviously impossible to draw any definite conclusions as to what effect the Pneumonia Control Program has had in decreasing the death rate from this disease, because the duration of the program is too short and the incomplete reporting of cases in the past renders a statistical report impossible. However, in comparing the ten year average of deaths from pneumonia reported to the State Health Department for the years from 1930 to 1939, inclusive, with the deaths reported since July, 1939, and including the first three months of the Pneumonia Control Program, we note some startling results.

Month	10-Year Average 1930 - 1939	For 1939
July	18	15
August	15	6
September	19	13
October	34	27
November	38	20
December	44	29 (Dec. 15)

This definite decrease in the death rate for pneumonia during the six months preceding December 15, as compared to the ten-year average, can, undoubtedly, be attributed to the use of sulfapyridine. However, one month after the Pneumonia Control Program began, the reported deaths from pneumonia were 28 as compared with an average of 64 for the ten-year period from 1930 to 1939. In February there were 43 deaths reported for the ten-year period, while there were 24 in 1940. In March there were 49 deaths reported for the ten-year period and only 16 for March, 1940. When we consider that almost as many cases of pneumonia were reported to the State Health Department during the first three months of 1940 as were reported during the entire year in 1930 and in 1939, we can assume that the incidence of pneumonia during the past winter has at least equaled that of the previous two years. However, the death rate is much lower, and we feel that this is due not only to the use of sulfapyridine and serum in the treatment of pneumonia patients, but also to the educational campaign which was carried on with the entire profession in the state and the availability of laboratory facilities and free drugs and serum, especially for the medically indigent. If a statistical study of the results of the program for the six months' demonstration period shows that the mortality from pneumonia in North Dakota is reduced to the five or six per cent level reported elsewhere, we feel that the program has justified itself. The sparse population in the western half of the state makes the problem of early typing of the pneumococcus quite difficult, but if the facilities for typing, and the drug and serum are made available, many of the seriously ill patients who have hitherto died will be saved.

Respectfully submitted,

L. W. LARSON, M.D.,
Chairman.

Committee on Medical Economics

The committee on Medical Economics submits the following report of its activities during the past year.

General Activities

Some correspondence has been developed with doctors in neighboring states exchanging information concerning activities of the F.S.A. Your committee has kept in touch with activities in other states, notably Michigan and California, regarding prepayment plans for medical care. Discussions have been held with the North Dakota Hospital Association concerning prepayment hospital plans. Your chairman attended the National Conference on Medical Service in Chicago, February 11.

Welfare Boards

We have had little direct contact with the State Public Welfare Board, possibly due to the fact that your chairman does not live in Bismarck. We have received the general impression that the state Public Welfare Boards and the various county Welfare Boards are all very short of funds and have felt the need of sharply curtailing the expenditures for medical care. We believe that our profession has recognized that limited funds are available for medical relief and that they have generously contributed a great deal of medical services.

Early in February a survey was conducted to determine, so far as possible, the manner in which county Welfare Boards were meeting their obligations.

A questionnaire was sent to a leading doctor in each county asking the following questions:

1. Do you have a salaried county doctor or doctors?
2. Do the majority of doctors participate in the Welfare Board Medical Relief program?
3. Does your county Welfare Board adhere to our standard relief fee schedule?
4. Do they pay bills in full or resort to proration?
5. Do they insist on patient getting an authorization before work is done?
6. Would you describe relations between County Welfare Board and the physician in your county as cordial, or otherwise?
7. Since July 1, 1939, has your county assumed the responsibility of paying for medical care of indigent farm families?

Of the 53 counties replies were received from 47 which showed that:

1. 30 counties provided free choice and 17 counties had one or more salaried physicians.
2. In 36 counties the majority of physicians cared for relief clients, while in 10, less than a majority did so.
3. 25 counties adhere to our standard relief fee schedule, 3 follow it fairly well, 14 do not.
4. 25 counties pay bills in full, either by cash or warrants, 9 prorate, 3 have special arrangements.
5. 34 counties require authorization, 5 do not.
6. Relations are described as good in 30 counties, fair in 11, bad in 4.
7. 16 counties have assumed responsibility for medical care to indigent farm families, 12 give partial assistance, and 12 none.

Various comments were appended, but there was surprisingly little dissatisfaction expressed. It would appear from this and other information reaching your committee that the profession as a whole is better satisfied with the present state of affairs, economically speaking, than they were under last year's program.

As you are well aware the State Public Welfare Board does not have direct control over local county Welfare Boards and while they have recommended adherence to our fee schedule and free choice of physician to the local boards they cannot compel them to follow it. The Economics committee would urge all local medical societies to use every possible means to improve their relations with their county Welfare Boards.

Farm Security Administration

We have continued negotiations with the F.S.A., meeting with Farm Security officials on July 30, 1939, November 5, 1939, and March 3, 1940, in addition to carrying on considerable correspondence. For the record I have prepared and will file with our secretary a detailed report of these meetings and the correspondence. I belive it would be best if I now present to the House of Delegates a brief digest of the year's work and some recommendations.

At our meeting July 30, 1939, no agreement could be reached and we indicated to the State Hospital Association that it would be satisfactory to us if they concluded a separate agreement. This was done, but the agreement signed in Lincoln was disapproved in Washington, because officials there felt that any hospital plan should have at least an associated plan for medical care.

On November 5, we met and discussed further a plan of local units. At that time we were discussing a plan for medical care only at a premium of $17.00 per family, excluding dentists, drugs and hospitals. The committee recommended the adoption of this local plan and President Dr. Brandes submitted the proposal to each component society for their approval or rejection. It is my understanding that a majority of the societies voted to permit the local plan to be put into effect wherever it was desired. This in turn was taken up at a special meeting of the councillors who decided to delay action in the matter until this meeting of the House of Delegates. The exact plan offered at that time, for medical care only, is not at present being considered, but the principle of whether or not local or county-wide plans may be set up requires consideration by the House of Delegates.

We met again on March 3, 1940, and discussed various possible methods whereby farm families might receive assistance. The following statement indicates the position taken by our members at this meeting. This was presented to the F.S.A. verbally:

> There are a large number of farm families (approximately 35,000), in North Dakota, who at certain times, do not have funds to pay for medical care. Inasmuch as their status cannot be accurately known in advance and may, in fact, vary considerably during the year and for other good reasons which we have learned by experience, we do not believe that payment for emergency medical care should be on a prepayment basis. We reaffirm our opinion that emergency medical care should be paid for on a basis of need to those who are in fact indigent or medically indigent at the time the services are required. We have in North Dakota the public Welfare Board who have the information and the training required to act as administrative agents to direct such care in collaboration with the F.S.A. and local physicians committees. Therefore we request the F.S.A. to make available in North Dakota a sufficient sum of money to pay for needed emergency medical care to indigent farm families. This fund to be administered jointly by the F.S.A. and county Welfare Board who will determine the question of eligibility for medical care and a committee of local physicians who will determine the emergency requirements and other strictly medical matters of each case.

The above resolutions, I believe, represent our attitude, but they are and will continue to be totally unacceptable to the F.S.A. In order to understand the position of the F.S.A. it would be well to briefly review the kind of work they are engaged in, both here and in the rest of the United States. The F.S.A. is an agency of the Federal Government under the Department of Agriculture. Their essential function is one of rehabilitation of farmers by means of loans of money, advice and supervision. In North and South Dakota and among the migrants in California they have engaged in relief assistance, that is, direct grants to farm families in need plus the loans for medical care with which we are all familiar. During the past year they have, to a large extent, discontinued direct relief and are concentrating their efforts towards the rehabilitation of a relatively small group of families, their standard loan clients. Standard loan clients receive loans and accept practically complete supervision of their affairs. Thus they may have a joint bank account with the local F.S.A. administrator. They try to operate under a fixed budget prepared by the administrator. This budget provides for all reasonable contingencies, but of course the expenses of any illness can not be estimated. Therefore the F.S.A. have sponsored throughout

the United States prepayment programs for medical care of emergency illness financed by loans to individual clients.

While there may be slight individual variations their standard plan goes something like this: The State Medical Association is first approached and if they subscribe to the plan a master contract for that state is made up. This sets out the general rules under which local societies may carry on. The doctors in a county or a group of counties are approached and if they accept the plan another contract is drawn up between them and the F.S.A. Such contracts are relatively simple as a rule. The F.S.A. agrees to loan certain individuals so much money (thirty dollars per year per family is the usual amount), which is turned over to a lay trustee who pays approved bills. The doctors and allied groups agree to furnish medical, dental, drugs, and hospital care required for the treatment of emergency illness. Usually there is a reviewing committee of doctors and other regulations of a type with which you would all be familiar.

We have some information as to how these plans work out elsewhere, especially in Kansas and Nebraska. They function about as you would expect them to with proration almost always present, but the amount varying in different localities. In other states there is usually a provision that hospital and druggist bills be paid in full and what is left over prorated among the doctors and dentists. In looking over their statistics one finds that their hospital bills are a much smaller percentage than our experience in North Dakota would indicate as likely to occur here. Also their fee schedule is uniformly higher than our relief fee schedule approximating usual fees, so that while they have proration their net return is considerably better than our experience under the F.M.A.C.

In effect this envisages the setting up of small county or district prepayment plans for emergency medical, dental, drugs, and hospital care for a premium of approximately $30.00 per family per year, with doctors in control after the premium has been received.

This then is the type of proposal which the Farm Security Administration now presents to your committee.

In considering such a proposal the question immediately arose as to exactly what people would participate. Obviously, so far as the F.S.A. is concerned, they speak only for those to whom they will be making a loan for this purpose. If the medical group wish to admit other persons who pay the premium themselves that is their own affair. The F.S.A. state that there are three classes of farm families to whom they will extend aid for the purpose of participation in such a plan.

1. The standard loan group approximately of 6,000 families in North Dakota.
2. Families who are not now in the standard loan group, but are considered as eligible to be so, an estimated 5,000 families.
3. A group of emergency borrowers who, provided they meet certain requirements, which some will not be able to do, may receive loans. No estimate can be placed as to the number, but they probably would not be many. As a conservative estimate it is possible that from ten to fifteen thousand farm families in the entire state would be eligible to receive a loan from the F.S.A. for such a purpose, if every county in North Dakota participated.

There would then remain a group estimated at from fifteen to twenty thousand families whom the F.S.A. does not propose to aid. They state that they are not responsible for the care of all indigent farm families and that this group must receive assistance, if it is required, from Welfare Boards.

You will readily see that we are faced with a fundamental change in our relations with the F.S.A. Whereas we formerly approached the F.S.A. asking them to assist us with our problem, now the F.S.A. are approaching us with the request that we assist them in solving theirs. Our difficulty is that of furnishing medical care to needy farm families without remuneration. The Farm Security Administration, in their endeavor to render farm families self-supporting, wish to avoid unforeseen depletion of the families' funds because of expenses incident to illness. They ask us to help them budget such expense by means of a prepayment medical plan.

In summary let me state that the F.S.A. is prepared to loan certain individuals approximately $33.00 per family per year to purchase from a local medical unit emergency medical hospital and drug services, with some dentistry. This plan can be modified to a certain extent, but they insist that it operate as a local unit or units and receive the approval of the State Medical Association.

The Kotana Medical Society, comprising Willaims and McKenzie counties, have presented a resolution indicating that they may wish to participate in such a plan.

It seems quite likely that some of our counties may feel that it would be advisable for them to enter into an agreement with the F.S.A. Whether they do or not will probably depend a great deal on crop conditions and whether or not the F.S.A. proposals can be broadened to include more of the actual indigent farm families. I believe that this committee must have authority to enter into such an agreement. Therefore we make the following recommendations to the House of Delegates:

1. We recommend that present F.S.A. proposals be studied further by the committee.
2. We would ask that your committee receive authority from the House of Delegates to enter into an agreement with the F.S.A. for either a state-wide or local program as the committee may deem advisable, subject to the approval of the Council.

W. A. WRIGHT, M.D., Chairman.

President BRANDES: Thank you very much, Dr. Wright, for that very fine report. We appreciate the work you have done. Your report will be referred to the Reference Committee. The Delegates will have an opportunity to meet with the Reference Committee, and make their desires known on the recommendations submitted by the Economics Committee. It is about time to adjourn. We have been invited to attend a joint meeting of the service clubs of Minot at a luncheon in the Presbyterian Church parlors where an address will be delivered by the Honorable John M. Pratt, executive administrator of the National Physicians Committee.

I want to appoint the Nominating Committee at this time so that they can report this evening: *Nominating Committee*: Dr. A. C. Fortney, Dr. W. A. Liebeler, Dr. M. G. Platte.

(The First Session of the House of Delegates of the North Dakota State Medical Association was adjourned by President Brandes at 12 noon.)

SECOND MEETING of the HOUSE OF DELEGATES

The second session of the House of Delegates was called to order by the president, Dr. H. A. Brandes, at 2:00 P. M., Monday, May 6, 1940, in the Masonic Temple, Minot, North Dakota.

Secretary Skelsey called the roll, and the following officers, councillors, delegates and alternates responded:

Doctors:

H. A. Brandes, Bismarck
A. W. Skelsey, Fargo
A. Carr, Minot
F. W. Fergusson, Kulm
A. E. Spear, Dickinson
G. M. Williamson, Grand Forks
N. O. Ramstad, Bismarck
A. D. McCannel, Minot
F. L. Wicks, Valley City
Chas. MacLachlan, New Rockford
A. C. Fortney, Fargo
P. H. Burton, Fargo
H. W. Miller, Casselton
B. Hughes, Rolla
W. A. Liebeler, Grand Forks
P. H. Woutat, Grand Forks
H. O. Grangaard, Ryder
A. W. Macdonald, Valley City
R. H. Waldschmidt, Bismarck
O. T. Benson, Glen Ullin
C. C. Smith, Mandan
G. B. Ribble, LaMoure
A. P. Nachtwey, Dickinson
P. A. Boyum, Harvey
W. W. Wood, Jamestown

The president declared a quorum present and the House duly constituted for the transaction of business.

President Brandes: Let us have the report on Public Health.

Secretary Skelsey: Dr. Williams sent in her report on Public Health, and asked that I read the same as she is in Washington, D. C., and unable to attend this meeting.

Secretary Skelsey read Dr. Williams' report on Public Health:

Committee on Public Health

The chairman of the Committee on Public Health regrets to report that a meeting of this committee has not been called during the year. The demands upon the time of the chairman for work on the Committee on Maternal and Child Welfare, as well as supervision of the assembling, preparation and compilation of information for the use of the committees on Venereal Disease, Pneumonia, Tuberculosis, and Cancer Survey, respectively, were considerable during the year, with the result that time for calling a meeting of the Committee on Public Health was not available. The inactivity of this committee, however, has been compensated for, to some extent, by the work of the committees just mentioned, each of which has been in its special field, an integral part of any public health activity of a state medical association. The assistance of these committees which act in an advisory capacity to the State Health Officer in the development of sound public health policies applicable to conditions in the state, is of inestimable value.

The chairman recommends the continuation of the appointment of these committees in the special fields related to public health, and further recommends that membership be stabilized to the extent that some of the members carry over from one year to the next. This is a saving of time and effort for the committee members and promotes continuity of action.

The Chairman recommends the continuation of a committee on Public Health for the coming year, (1) particularly, since this will be a legislative year and advice may be needed in relation to public health legislation; (2) to assist in coördinating the many activities of the State Medical Association in public health, and in covering the fields not now covered by committees. (3) To study contemporary legislation in relation to public health with a view to amending some of our almost obsolete laws. (4) To assist in the arrangement for refresher courses in public health and public health administration for the county and city health officers (151) as well as for any physicians interested in this field in the coming year. (5) To study ways and means of improving public health work in the counties and cities, particularly, in relation to remuneration, tenure of office, and merit of the personnel.

Respectfully submitted,

Maysil Williams, M.D.,
Chairman.

Secretary Skelsey read the report of Dr. H. E. French, chairman of the Committee on Medical Education:

Committee on Medical Education

As in other years, the members of your Committee on Medical Education have been in frequent contact by conference and correspondence.

The general plan of the school, the difficulties it has encountered with the rating bodies in the last few years because of lack of support, and the somewhat better but modest efforts of the state at the last two sessions of the legislature, are well known to you and will be given no discussion.

Soon after the state meeting of a year ago, the Council on Medical Education took action following the inspection made by Dr. Cutter and Dr. Anderson, as mentioned in this report of last year. The action of the Council was to continue to recognize the school, but as on probation. A legal complication has delayed some of the improvements contemplated a year ago. The future of the school, of course, depends upon its success in working out its problems; but, primarily, it depends upon the question of support.

In the meantime, the work of the school continues with the staff and improvements as established one or two years ago, with the usual number of students, about twenty-five, in each class, and with gratifying results. All of the students who completed the course in 1939 were accepted in other schools, and are now continuing their training elsewhere. This year, all who should complete the course in June have already been accepted in other schools—one at Harvard, three at Pennsylvania, three at Northwestern, ten at Rush, one at Chicago, two at Washington, four at Temple. As usually happens, eleven members of the class to finish the two-year work in June, 1939, elected to write on Part I of the National Board Examination. Nine of these wrote upon all subjects, and five passed successfully in all parts; two wrote successfully upon three or more of the six subjects and were given partial credit; in order to complete Part I they must rewrite the subjects in which they were low. Two of the eleven chose to write upon what is called the divided examination plan, but they also were successful so far as they went.

H. E. French, M.D.,
Chairman.

Secretary Skelsey read the Necrology Report.

Necrology Report

The coming of the "Sere and Yellow Leaf" and the falling of faded petals are as much parts of the eternal scheme as swelling buds, opening blossoms, and growing grain; and thus in annual session it becomes us to lay aside for a brief space the tasks of the day, as we pay our tribute of memory to those of our fellows who

"Short days ago
Lived, felt dawn, saw sunset glow,
Loved and were loved."

FREDERICK ELASKER SALVAGE

Dr. F. E. Salvage was born in Syracuse, New York, and died at LaMoure, North Dakota, July 15, 1939, at the age of 73 years, giving 47 years of faithful service to humanity.

He graduated from Rush Medical College in 1892, was admitted to practice in North Dakota the same year, and immediately opened an office in Wheatland, Cass county, where he remained for 15 years. From 1907 until 1913 he practiced in Fargo, part of which time he served as coroner. In 1913 he moved to LaMoure where he held several public offices of trust and responsibility, and where he remained until his death. Interment was at Wheatland, North Dakota.

GEORGE GRANT

Dr. George Grant was born of Scottish parents at Bothwell, Ontario, June 18, 1873, and died at Bismarck, North Dakota, May 30, 1939. Dr. Grant graduated from Illinois Medical College in 1904 and began practice at Linton, North Dakota. In the following year, he located at Wishek, North Dakota, where he made his permanent home.

He was one of the organizers of the Southern District Medical Society, and a member of State and National Associations. With the spirit of the pioneer, he became interested in the industrial development of the country and was identified in its economic and social life, giving freely of his time and wisdom for community betterment. To the many he served so long, so faithfully and so well, Dr. Grant leaves a rich legacy of happy memories as an honored and beloved physician and friend.

CARL A. HJELLE

Dr. C. A. Hjelle was born October 6, 1884, at Volga, South Dakota, and died at Portland, North Dakota, September 11, 1939. He received his B.A. degree from Luther College, Decorah, Iowa, and his M.D. degree from Rush Medical College, Chicago.

He was licensed in North Dakota July, 1916, and located at Clifford. In 1921, he moved to Portland, North Dakota, where he practiced until six months previous to his death. He was a member of the Traill-Steele Medical Society, and for a time served as its president. He was prominent in civic affairs and served for many years as a member of the Portland council. Dr. Hjelle was connected with the Mayville Hospital and did much to further its interests. He was faithful to his trust and an honor to his profession he loved so well.

W. S. GRONINGER

Dr. W. S. Groninger, of Des Lacs, North Dakota, was born at Paterson, Pennsylvania, July 20, 1865, and died at Minot, North Dakota, July 10, 1939. He was educated at Review Academy, Pa., and as was customary in those days, read medicine under a preceptor, Dr. Shelley of Port Royal, Pennsylvania, and later graduated from Jefferson Medical College, in Philadelphia in 1889.

He practiced in Pennsylvania until 1900, holding various offices of trust and responsibility. He then came to North Dakota and engaged in farming. His medical practice in North Dakota was confined to emergency and consultation cases for which he made no charge. He was a welcome visitor at many a pioneer settler's home in times of stress when professional help was hard to obtain. He was a successful business man and left a sizable unencumbered estate, as well as a legacy of cherished memories.

OLAF BENTZEN

Dr. Olaf Bentzen was born in Christiansund, Norway, October 27, 1867, and died in Miami, Florida, September 16, 1939. He was a graduate of the University of Christiania, Norway, in 1893. He came to the United States in 1903, was licensed in North Dakota on October 12, 1905, and located at Grand Forks where he remained until a year ago when he moved to Miami, Florida.

Dr. Bentzen studied in many European centers, and was an outstanding man in his profession. His fine surgical technique gave him an enviable reputation among his fellows. He travelled extensively and was well posted on world affairs. He was gentlemanly and courteous at all times. Being of a retiring disposition he had few intimate associates, professionally or otherwise; and did his work, and did it will, as an individualist. He had never married and a sister, Johanna Bentzen, is the only survivor.

HENRY O'KEEFE

Dr. Henry O'Keefe was born at Lindsay, Ontario, March 14, 1855, and died at St. Paul, Minnesota, September 2, 1939. He graduated in Medicine from McGill University at Montreal in 1883, came West and in the same year began practice at Minto, North Dakota, where he remained until 1906 when he moved to Grand Forks where he engaged in active practice until the time of his death. He was thus, as far as known, the oldest practitioner in point of service in the state. He was an honorary member of the Grand Forks District Medical Society and of the State Medical Association. He was public spirited and gave freely of his time and means for community interests. Dr. O'Keefe was an ideal family physician, kind, considerate and faithful and in addition was a friend, confidant and counselor to his people.

His sympathetic touch, inspiring word and assuring smile were often more effective than the resources of pharmacy. He was a valued member of society, kind and helpful to his family, true to his ideals and loyal to his friends, his profession, his country and his church.

W. H. MOORE

Dr. W. H. Moore was born at Bay City, Michigan, December 15, 1875, graduated from the College of Physicians and Surgeons, Chicago, Illinois, in 1903, practiced in San Diego, California, for four years, was licensed in North Dakota in 1908, practiced at Sykeston, at Harvey, LuVerne, North Dakota for varying periods and at Valley City, North Dakota, for the past twenty-one years, thus completing thirty-one years of practice in the state. He died at Fargo, North Dakota, October 20, 1939.

He served in the Medical Corps in the World War and was a member of the American Legion. He was honored by his fellows in serving as secretary of his district medical society, and as president for the past year of the North Dakota Public Health Officers Association. Dr. Moore was a worthy member of the North Dakota Medical Association and as a general practitioner served his people faithfully and well.

S. A. ZIMMERMAN

Dr. S. A. Zimmerman was born at Elizabeth, Minnesota, July 4, 1887, and died at Valley City, North Dakota, November 23, 1939. He received his academic education at Northwestern College, Naperville, Illinois, St. Cloud Teachers College in Minnesota, and Hamline University, St. Paul. He graduated in Medicine from Northwestern University Medical School in 1907, and after a year of internship was licensed in North Dakota in 1909, and began practice at Valley City where he afterwards resided.

He was interested in social, civic and recreational activities and a leader in professional circles. He was an active and energetic member of community life and gave liberally of time and means for its welfare.

An auto accident contributed to his demise. Mrs. Zimmerman and a family of four survive.

E. E. WANDS

Dr. E. E. Wands was born in 1876 at Hampton, Iowa, and died at Tampa, Florida, November 19, 1939. He graduated from Keokuk (Iowa) Medical College in 1906, was licensed in North Dakota, October 17 of the same year and began practice at Lisbon, North Dakota, where he remained during his professional lifetime.

During the past few years on account of a chronic ailment he has been inactive and spent most of the time in Florida. He was a member of local and state medical organizations, as well as several Masonic bodies. Mrs. Wands survives and lives at Tampa, Florida.

AMOS P. FLATEN

Dr. A. P. Flaten was born in Edinburgh, North Dakota, December 10, 1890, the eldest son of Dr. and Mrs. A. A. Flaten, and died at Yuma, Colorado, June 4, 1939. He was a graduate of the University of North Dakota and of Rush Medical College, Chicago, and was an intern of Presbyterian Hospital, Chicago.

During the World War, he was stationed at the Cincinnati General Hospital. Returning to North Dakota, he practiced for a time at Edinburgh, and later after special graduate work in Chicago, he became associated with Dr. G. J. Gilason of Grand Forks. In 1926, he moved to Yuma, Colorado, where he established a practice and where he remained until his death. His body was laid to rest in the family burial plot in Edinburgh cemetery under American Legion arrangements.

EDGAR A. PRAY

Dr. E. A. Pray of Valley City, North Dakota, was born in Minnesota, February 26, 1868, and died at Fargo, North Dakota, November 16, 1939. He came with his parents to Fargo in 1878 and in 1883 went with them to Barnes county and grew up with the country. Dr. Pray was thus a real pioneer and as a member of the Old Settlers Association, was a "Voyager of the Dog Train." Dr. Pray attended Fargo High School and Carleton College, Northfield, Minnesota, and graduated in Medicine from the University of Pennsylvania in 1894. After interning for a year in St. Luke's Hospital, Bethlehem, Pennsylvania, he returned to Valley City, North Dakota, where he made his future home.

Dr. Pray has always been recognized as one of the leaders of organized medicine in the state. He served as president of the State Association in 1919 and as its representative to the American Medical Association on several occasions. He took an active interest in Public Health problems, was for 12 years a member of the executive board of the North Dakota Anti-Tuberculosis Association and its president in 1936. His interest in its activities never lagged, and it was richer because of his wise counsel and constructive leadership. He stood for the best things in professional and civic life and gave freely of time and talent for their betterment.

CORA SMITH KING

Dr. Cora S. King was born in Rockford, Illinois, September 7, 1867, and died at Hollywood, California, November 21, 1939. The following excerpt from *Who's Who in America*, (1934-5) tells in brief the story of her professional life:

> "Dr. King grad. Nat. Sch. of Elocution and Oratory, Phila., 1886; Sc.B., U. of N. Dak., 1889; M.D., Boston U. Sch. of Medicine 1892; Practiced in Grand Forks, N. D., 1892-96, Minneapolis, Minn., 1896-1906, Seattle, Wash., 1906-12, Washington, D. C., 1912-24, Pasadena, Calif., 1924-27, Hollywood, Calif., since 1927; dir. Physiotherapy dept. Hollywood Hosp., 1927—."

Dr. Cora S. King had many distinctions to her credit. She was one of six who graduated in the class of 1889, the pioneer class of the University of North Dakota. She was the first woman physician admitted to practice in the state of North Dakota, and was the first woman surgeon to perform an abdominal operation in the state of North Dakota and in the city of Minneapolis and in Washington, D. C.

She was a daughter of pioneers who came to North Dakota in 1879; and not only had vision, but will and ability, to go and to do. Lured by "the best is yet to be" her life was a continuous round of achievement. She blazed a trail from West

to East and back again and left the imprint of her personality wherever she went.

Dr. King was a born leader and has been president of a full score of National, Social, Welfare and professional organizations. She was a brilliant speaker and in 1887 entered the campaign for woman suffrage; and all through her life consistently labored for woman's rightful place in social and economic life. Richly endowed she gave graciously of her gifts for the weal and happiness of those about her.

INGOL McKNIGHT LAW

Dr. I. McKnight Law was born May 23, 1873, in Ontario, Canada, and died at Bismarck, N. D., January 11, 1940. He had been a resident of North Dakota for 45 years.

He pursued his academic studies in the schools of Ontario, graduated from the Detroit College of Medicine, Michigan, 1905, and was licensed in North Dakota July 9, 1906. He practiced at Loma, N. D., for three years, at Munich, N. D., for four years, and at Halliday, N. D., for 28 years.

Dr. Law was an excellent type of the country family physician, capable, willing, helpful and sympathetic. A high school professor before studying medicine, he never lost interest in educational matters and was instrumental in securing good schools in the communities where he practiced. He always took an active interest in local and state affairs and stood for the best things in the social and economic life of the people. To such as he, the country owes much. He is survived by wife, daughter, sister and three brothers, to whom sympathy is extended.

GEORGE H. HILTS

Dr. George H. Hilts, late of Bowbells, North Dakota, died at Buffalo, Kansas, in April, 1940, aged 58.

He graduated from University Medical College, Kansas, in 1908 and was licensed in North Dakota (rec. with Kansas) Jan. 8, 1915, after which he practiced at Bowbells and surrounding country to within a year of his death, during which time he held the position of health officer and coroner of Burke county.

Serving a wide and thinly settled section, his work was at times arduous, but for 25 years he carried on as a country doctor, giving his all for the needs of the people. His body was brought to Bowbells for burial.

CLARENCE PRENTICE RICE

Dr. C. P. Rice was born June 2, 1875, at Armada, Mich., and died at Breckenridge, Minn., April, 1940. He graduated from the University of Minnesota Medical School, 1909, and was licensed in North Dakota, October 14, 1909, from Richland county.

He served in the Spanish-American War with Co. E, 13th Minnesota Infantry. He was wounded in the battle of Manila and received the Purple Cross decoration. He was discharged with the rank of captain.

He was a member of Richland County Medical Society and registered as of Wahpeton, N. D. He is survived by wife and daughter, to whom sympathy is extended.

JOHN P. MILLER

Dr. J. P. Miller was born in Harrisville, Illinois, May 12, 1879, and died at Grand Forks, N. Dak., April 19, 1940.

Dr. Miller graduated from the Baltimore Medical College in 1904, and practiced in Illinois until shortly before the World War when he moved to Mandan, N. D.

He was licensed in North Dakota (rec. with Illinois) January 4, 1918. During the World War he served as first lieutenant in the Army Medical Corps at Camp Greenleaf, Ga., until his discharge, December 19, 1918. Shortly afterwards he joined the Witherstine Clinic, Grand Forks, confining his practice to eye, ear, nose and throat. In this connection he continued until his death.

Dr. Miller was a member of local, state and national medical organizations and was honored by his fellows by being elected to several positions of trust and responsibility.

Dr. Miller was highly respected as a physician and citizen. He put the best that he had into his work, which was done quietly and well. Among his fellow practitioners he was a favorite. He was ethical, genial, generous, dependable and always the kindly gentleman in which the friendly human touch was never lacking.

V. G. MORRIS

Dr. V. G. Morris of Beach, North Dakota, passed away April 20, 1940, aged 59. He was born May 5, 1879, in Warwick, Ontario. Attended Detroit College of Medicine, graduating in 1905. Following his internship in Harper Hospital, Detroit, Michigan, he was licensed in North Dakota, year 1906, as from Rolette county. He practiced at Milo, Schafer, Watford City, Tioga and Beach. It is recorded that in the year 1914, when a new town was started west of Schafer, he moved there and was instrumental in naming the town Watford City, for an old home in Ontario. It will thus be seen that he was a man of the frontier, and a pioneer in the true sense of the term, with the joy of service at times as his recompense for work done. He was McKenzie county's first resident physician, and he loved the freedom of its wide open spaces.

He is survived by wife and two children, to whom go sympathy and kindly thoughts.

James Grassick, M.D.

President Brandes: I ask you all to rise a moment in respect for those who left our midst this past year. (Assembly stood to pay its respects.)

Dr. McCannel: I am sure we all look forward to hearing the report of Dr. Grassick, and I move that this association send him greetings and tell him we miss him today.

Dr. MacLachlan: Second.

The motion was unanimously adopted.

Committee on Medical History

Dr. Williamson: I might say I had a talk with Dr. Grassick on Friday, and, of course, most of you know he is not physically fit to come out. Dr. Grassick has a manuscript for a certain volume for the history of North Dakota, and we will have to consider doing something with it. I don't know what we will do after Dr. Grassick passes on. He has been a wonderful man. He will be 90 years of age sometime in June, and not many fellows in college now can write such a message as he has sent us. If any of you don't have a copy of the *History* of Dr. Grassick, published some years ago, you can get it from the Secretary.

President Brandes: What is the cost of such a *History*, Dr. Skelsey?

Secretary Skelsey: $2.00 on delivery or $2.25 by mail.

President Brandes: We will have the report of the Committee on Journal-Lancet.

Committee on Journal-Lancet

The committee on the Journal-Lancet has not had a meeting during the year, for the reason that no business has developed that would necessitate such action.

There are no recommendations that the committee has to make regarding the relationship between the Society and the Journal-Lancet. The committee only wishes to emphasize the recommendation which was made last year and in previous years, that the members of the Society make better use of the Journal's Editorial Department in expressing their views on questions of pertinent and contemporary interest.

Julius O. Arnson, M.D.,
Chairman.

Committee on Tuberculosis

We wish to express our sorrow at the loss of Dr. Will H. Moore, the chairman of this committee, just about the time that the committee started to function. At the request of the president, Dr. J. O. Arnson was asked to act in Dr. Moore's capacity.

One meeting of the committee was held on September 24, 1939, at Bismarck. At this meeting, three members of the committee were present. It was held in conjunction with the officers and directors of the North Dakota Antituberculosis Society, and a comprehensive schedule of the work of the committee for the ensuing year was outlined and inaugurated. Copies of the recommendations of the committee and the minutes of the meeting are appended and constitute a part of this report. The committee has had excellent coöperation from both the State Department of Health and the North Dakota Antituberculosis Sociey. In fact, it is our opinion that without this coöperation, the efforts of the committee would be futile.

Inasmuch as the work necessary to accomplish ideal results

in the campaign against tuberculosis in North Dakota is much greater than the committee can undertake at once, it was thought that the objectives should be limited as described in the appended report. If these measures are instituted and carried out by the members of the medical profession, a great deal will have been accomplished.

Very recently, Dr. Charles A. Arneson, the City Health Officer of the city of Bismarck, with the help of the Bismarck medical profession, undertook a survey of the school children in the seventh, ninth and eleventh grades, the results of which have not yet been published. The information from such a survey is intended to determine the incidence of tuberculosis among school children. This is a very interesting experiment and the project met with the approval of all bodies interested in antituberculosis work. However, the procedure is not recommended for general use in all communities because it is an expensive method of determining the presence of tuberculosis. It is the recommendation of Dr. Maysil Williams, the State Health Officer, that in the future stress should be laid upon the complete and thorough investigation of all contacts of active cases of tuberculosis. In this way, a more constructive campaign can be waged with the limited facilities that we have to work with.

We recommend a full publicity of this report, among all physicians in the state, in order that the importance of cooperation may be emphasized.

JULIUS O. ARNSON, M.D.,
Chairman.

RECOMMENDATIONS OF THE TUBERCULOSIS COMMITTEE

The Tuberculosis Committee of the North Dakota State Medical Association met in Bismarck September 24, 1939, to consider the tuberculosis problem in North Dakota. The members of this committee are as follows:

W. H. Moore, M.D., chairman, Valley City
J. O. Arnson, M.D., Bismarck
C. V. Bateman, M.D., Wahpeton
John Cowan, M.D., Bismarck
O. S. Craise, M.D., Towner
G. A. Dodds, M.D., San Haven
John C. Fawcett, M.D., Devils Lake
Victor Fergusson, M.D., Edgeley
Amos Gilsdorf, M.D., Dickinson
R. O. Goehl, M.D., Grand Forks
A. F. Hammargren, M.D., Harvey
George Ivers, M.D., Fargo
V. J. LaRose, M.D., Bismarck
F. O. Woodward, M.D., Jamestown
W. A. Wright, M.D., Williston.

The following recommendations were made at this meeting:

1. All contacts of known cases of tuberculosis should be examined by the family physician whenever possible.
2. In those instances where the State Department of Health does not receive the cooperation of the local health officer or the local physician in the examination of contacts, the Tuberculosis Committee should take the responsibility of seeing that this examination is made.
3. In order to have the Tuberculosis Control Program properly coordinated, all X-ray films of contacts which are paid with funds of the North Dakota Anti-Tuberculosis Association should be sent to the State Sanatorium for review and reading before payment is made. It was also recommended that X-ray plates of private patients be sent to the Sanatorium for the same purpose.
   (a) A fee of $5.00 for a flat plate of the chest of medically indigent cases was suggested to the North Dakota Anti-Tuberculosis Association.
   (b) It was recommended that the Anti-Tuberculosis Association withhold payments for X-ray and physical examination until a report of the case is submitted to the State Department of Health, as required by law.
4. Uniform procedure in the performance and interpretation of the intracutaneous (Mantoux) test was recommended.
5. All tuberculosis control activities in cities and counties of the state should be under the control of the State Department of Health so that there will be adequate follow-up of tuberculosis cases and contacts.
6. It was recommended that the physicians of the state avail themselves of the services of the public health nurse in tuberculosis follow-up activities.
7. The committee accepted the tentative offer of the State Department of Health to finance refresher courses in tuberculosis for ten practicing physicians of the state at the University of Minnesota Continuation Center.
8. Because of the high incidence and mortality of tuberculosis among Indians of the state, the committee recommended that facilities be made available for the isolation and treatment of all cases of tuberculosis in Indians in North Dakota.

. . . . . .

President BRANDES: Next we have a report on Fractures by Dr. R. D. Campbell.

Dr. WILLIAMSON: Dr. Campbell is expected to arrive tonight.

President BRANDES: We will then have a report on Maternal and Child Welfare by Dr. John H. Moore.

Dr. MOORE: Shortly after your committee was appointed in 1935 by Dr. McCannel, we were called upon by a representative of the Children's Bureau, and advised it would be possible to have a full-time consultant in Obstetrics and Pediatrics, to go around and instruct our doctors. The committee took the view that this would not be at all acceptable. If there was any educational work to be done, it would be done through our own agencies. With this word, I will go on with my report.

Committee on Maternal and Child Welfare

The North Dakota Committee on Maternal and Child Welfare has continued its work of improving the opportunities for postgraduate study in obstetrics and pediatrics to North Dakota physicians. The response to this effort has more than exceeded your committee's expectations. The courses given throughout the state by Dr. Albert V. Stoesser, associate professor of pediatrics at the University of Minnesota, and Dr. Russell J. Moe of Duluth brought an increased enrollment, even exceeding the splendid response of the previous year. These courses were given October 16-27, 1939, at Jamestown, Bismarck, Dickinson, Williston, Minot, Devils Lake, Grand Forks, Valley City, Wahpeton and Fargo. And so insistent was the demand by those physicians in attendance at these courses for lecture notes of them that your committee recommended to the North Dakota State Department of Health mimeographed copies of these notes be distributed to the physicians who had registered for these courses. This was done. Dr. Conrad and Dr. Pray have continued to function admirably as the subcommittee in charge of arrangements for these postgraduate courses.

Because of the enthusiastic response to the committee's plan of making courses available to North Dakota physicians at the center for continuation study at the University of Minnesota, it was recommended to the State Department of Health that places be arranged for thirty North Dakota physicians in pediatrics and thirty in obstetrics for this year. You will recall that last year ten physicians were in attendance at the course in obstetrics. Applications have been received for this year's courses, as for the course last year, through the component District Societies of the North Dakota State Medical Association. The course in pediatrics will be given in May, 1940, and the course in obstetrics at a time to be decided upon later.

Physicians who register and are accepted (for these courses) get a week of intensive postgraduate medical education amid most attractive surroundings with their tuition and expenses paid. It is the feeling of your committee that this program is far in advance of anything thus far proposed in the field of short but intensive postgraduate medical education. Your committee wishes to acknowledge with gratitude the splendid cooperation it has had from Dr. William A. O'Brien, the director of postgraduate medical education at the University of Minnesota. Dr. O'Brien has, at all times, been most helpful in arranging the courses with Mr. J. M. Nolte, director of the center for continuation study, and in placing them at the most advantageous times for the attendance of our doctors. Without this cooperation it would have been impossible to arrange them.

Tracing your committee's efforts to further postgraduate medical education in the fields of obstetrics and pediatrics, it seems to us that we can note an orderly progress in the development of this field. First came the papers on obstetric subjects by various members of your committee, given before the various component societies of the State Association. Then there followed the postgraduate lectures by committee-selected clinicians at various cities throughout the state, as has been done for the past three years. Now there has been developed the medical center idea for continuation study, a plan pioneered at the University of Minnesota, one of the outstanding features of this plan is the fact that the physicians in attendance have the opportunity to discuss their particular problems in round-table discussions with their instructors and in informal gatherings among themselves. There is abundant opportunity for individual as well as group instruction and the camaraderie thus engendered makes for harmonious and profitable relationships throughout.

As the center at Minnesota becomes more thickly populated by physicians taking the various courses offered it is increasingly difficult to arrange suitable periods for all who wish to study there. It is the feeling of your committee that, ultimately, the State Medical Association should take over the arranging of postgraduate medical courses within our own state. This can readily be done by committees such as your Maternal and Child Welfare Committee in the fields of obstetrics and pediatrics, and by other committees in other fields of medical practice. The North Dakota State Department of Health, by "ear-marking" certain federal funds for postgraduate medical education, has made possible our efforts in this work up to date.

The most logical plan for the future would be to bring outstanding clinicians to a convenient city in the state and build our own postgraduate courses around them with our own physicians doing a considerable amount of the teaching. We have the ability and the enthusiasm among many of our own members to make such a plan highly desirable.

Your committee is pleased to report that its Incubator Campaign is completed and that all North Dakota hospitals that desired to do so have purchased incubators built at the University of North Dakota. Forty-some units are now in operation. We desire to thank the University for its outstanding contribution to this phase of our program. From the president of the University, to the humblest workman in the shops, we have had the finest kind of coöperation. I would especially like to mention the technical help of Mr. E. G. Felt, superintendent of buildings and grounds at the University. He was never too busy to devote time to the technical problems involved in constructing these units.

North Dakota, based on the maternal mortality figures for 1938 and which have now become official, has the lowest maternal death rate in the United States, 2.4 per 1000 live births. We reported at some length to the State Association on this subject in a paper give before the scientific sessions at Fargo last year. While complete figures are not yet available for 1939, it would appear that the maternal death rate will be as low or lower than that of the previous year. This is a splendid record. It represents the efforts of our own physicians, working out their obstetric problems as individual physicians and in cooperation with their own medical organizations, it gives the lie to those who would argue that a government control of medical practice is necessary for the health of our people and to those who have so long argued that the maternal death rate in these United States is a disgrace that can only be removed by government control.

The private practitioner of medicine in North Dakota *has* assumed the leadership in the field of maternal care which is rightfully his and if he will continue to hold and enhance the value of that leadership, especially in the field of pre-partum care and the conservative management of labor he can maintain or even better the enviable place we now hold in the nation and while he is doing that he will again prove to even our severest critics that the American way—the way of private practice—is still the best way of supplying medical services to the citizens of our democracy.

Respectfully submitted,

John H. Moore, M.D.,
Chairman.

President Brandes: We thank you for that very fine report, Dr. Moore. I think most of you know that Dr. Moore and his co-workers in this field are not only getting state-wide recognition but national recognition. I think this committee has pointed out the way of solving some of the problems in this state, and we thank the Maternal and Child Welfare Committee for their splendid work.

President Brandes: We will now hear the report on Crippled Children.

Secretary Skelsey read the report of Dr. A. R. Sorenson, chairman of the Committee on Crippled Children.

Committee on Crippled Children

This committee has been designated an advisory committee to the State Department of Child Welfare.

One meeting was held at Bismarck, North Dakota, in November, 1939, at the call of Miss Theodora Allen, director of the Children's Bureau. Mr. E. A. Willson, administrator of the State Welfare Department, and Dr. Maysil M. Williams, State Department of Health, were also present.

The purpose of the meeting was to discuss and clarify the question of who might do the work which comes within the scope of the Bureau. Miss Allen stated that there were certain rigid standards of qualifications which had to be complied with and that she had no lee-way in the matter. Therefore, no matter how well qualified a surgeon might be to do certain types of Orthopedic Surgery, unless he had been certified by the American Board of Orthopedic Surgery, he would be unqualified under the present regulations. This is the method under which the department is now operating and will probably remain so unless changes are made in the regulations by the authorities in Washington.

No further business came before the committee during the year and there were no other meetings.

A. R. Sorenson, M.D.,
Chairman.

Committee on Radio

The Radio Committee met in December, 1939, at Fargo, North Dakota. Present were: Dr. Radl, Bismarck; Dr. Goehl, Grand Forks; Dr. Urenn, Fargo, and Dr. Fortney, Fargo.

This committee met for the purpose of drawing up a set of proposals expressing the policy by which Radio Programs could be determined. Such a policy was drawn up and presented to the Council of the North Dakota State Medical Society which met in January, 1940, in Fargo, North Dakota.

Since it was decided that such a policy should be acted upon by the House of Delegates at their annual meeting, no further activities have been carried on by the Radio Committee.

It is hoped by the committee that this policy might be adopted, and in the future a satisfactory and comprehensive radio program, for the entire state be developed.

The committee has all material in their possession for putting programs on the air, these programs all having been approved and received from the Radio Committee of the American Medical Association.

Respectfully submitted,

A. C. Fortney, M.D.,
Chairman.

(Following is the policy as adopted by the Radio Committee of the North Dakota State Medical Society, at Fargo, N. D., December 17, 1939.)

1. Each District Medical Society appoint a local radio committee for the purpose of putting on a radio program.
   (a) The name of the spokesman may or may not be announced, this to be decided upon by the local society. In all circumstances it should be announced that the spokesman is talking under the auspices of the local society, and any reference to the talk by the radio station should *always* include the name of the local medical society.
   (b) The State radio committee will act in advisory capacity to the local radio committee.
2. All broadcasts to be limited to medical subjects as suggested in outline by the American Medical Association radio talks. This subject matter may be obtained from the members of the State Radio Committee. Original talks may be presented with the approval of the local or the State radio committee.

3. All controversial subjects, such as: Medical Economics, Social Security, Socialized Medicine, Medical Cults, Quackery, etc., to be avoided.
4. Any broadcast of propaganda material by any State Committee shall be handled in conjunction with the State Radio Committee.
5. It is recommended that the local radio committee obtain publicity in local papers and schools concerning the time and title of local, state and national medical broadcasts.
6. Local societies without broadcast facilities may coöperate with neighboring societies having these facilities.
7. It is recommended that these broadcasts be given once a week, and not less than once every two weeks. Regularity is urged.
8. "Fan Mail" should be referred to the secretary of the local medical society and it is suggested that he acknowledge it and refer the correspondence to the family physician.
9. It is suggested that at the time of the annual state medical meeting that the program committee and the local and state radio committee arrange for broadcasts as part of the program at that meeting.
10. We recommend that an appropriation of $100 per annum be allocated to the State Radio Committee for defraying expenses of incidentals thereto.

B. M. URENN, M.D.
R. B. RADL, M.D.
C. O. GOEHL, M.D.
MAYSIL WILLIAMS, M.D.
A. C. FORTNEY, M.D., Chairman.

President BRANDES: That was the report approved by the Council at their special meeting, and the report will be referred to the Reference Committee and reported back this evening. Dr. Williamson, you are to report on Revision of Constitution and By-Laws.

Dr. WILLIAMSON: Mr. President and Gentlemen: I might say that I have not been very active on this committee. I have looked it over a little, but Dr. Fawcett has been chairman of the Committee on Revision of Constitution and By-Laws. Dr. Skelsey has copies here, which he will pass around, and you can follow the changes that have been suggested. I will draw your attention to the changes, before it is referred to the committee for final report.

(Mimeographed copies of the proposed Constitution and By-Laws were distributed to the members of the House of Delegates, by Secretary Skelsey.)

CONSTITUTION

ARTICLE I.

Name of the Association

The name and title of this organization shall be the North Dakota State Medical Association.

ARTICLE II.

Purposes of the Association

The purposes of this Association shall be to federate and bring into one compact organization the entire medical profession of the State of North Dakota, and to unite with similar societies of other states to form the American Medical Association; to extend medical knowledge and advance medical sciences; to *regulate* the standard of medical education and to secure the enactment and enforcement of just medical laws; to promote friendly intercourse among physicians; to guard and foster the material interests of its members and to protect them against imposition; and to enlighten and direct public opinion in regard to the great problems of medicine.

ARTICLE III.

Component Societies

Component Societies shall consist of those county or district medical societies which hold charters from this Association.

ARTICLE IV.

Composition of the Association

Section 1. This Association shall consist of Members, Associate Members, and Honorary Members.

Section 2. Members. The members of this Association shall be the members in good standing of the component societies.

Section 3. Associate Members. Teachers in any regular medical school, resident in North Dakota, and in no manner engaged in the practice of medicine and not otherwise eligible to regular membership, may become Associate Members of this Association, when elected Associate Members of the component society of the District in which said teachers live. Such members shall be designated Associate Members; and they shall enjoy the same privileges as regular members except the right to vote or be elected to office. They shall be charged no dues.

Section 4. Honorary Members. Any reputable physician who has been practicing medicine in the State of North Dakota for a period of fifty years shall be eligible to honorary membership without payment of dues upon election to honorary membership by his local society and approval by the State Association through its House of Delegates.

ARTICLE V.

House of Delegates

The House of Delegates shall be the governing body of the association and shall consist of the delegates of the component societies that elect them. It shall conduct all business of the association except such as is otherwise provided for by the constitution and by-laws. The following shall have the privileges of the floor but without the right to vote: The president of the association, the president-elect, the councillors, the secretary, the treasurer, the past presidents and the delegates to the American Medical Association. All recommendations of the House of Delegates dealing with the acquisition or disposal of property of any kind, or with the appropriation or expenditures of funds in any way, must be approved by the Council. A majority of the registered delegates shall constitute a quorum for the transaction of business.

ARTICLE VI.

The Council

Section 1. The Council shall be the Executive Body of the Association and shall consist of not more than ten councillors elected by the House of Delegates. The President and the Secretary of the State Association shall be ex-officio members of the council. Besides its duties mentioned in the By-Laws, it shall have charge and control of all the property of this Association of whatsoever nature and of all the funds from whatever source. The Council shall have full authority and power of the House of Delegates between the annual sessions unless the House of Delegates shall be called into a special session as provided for in the By-Laws.

Section 2. No person shall expend or use, for any purpose, money belonging to the Association without the approval of the Council.

Section 3. All acts of the House of Delegates involving the expenditure, appropriation, or use in any manner of money or the acquisition or disposal in any manner of property of any kind belonging to the Association, must be approved by the Council before the same shall become effective.

Section 4. The Council shall formulate rules governing the expenditure of money to meet the necessary running expenses and fixed charges of the Association, as well as such other rules governing its actions as it may deem necessary or desirable. Six members of the Council shall constitute a quorum for the transaction of business.

ARTICLE VII.

Sections and District Societies

The House of Delegates may provide for a division of scientific work of the Association into appropriate sections, and for the organization of such councillor district societies as will promote the best interests of the profession, such societies to be composed exclusively of members of the component local societies.

ARTICLE VIII.

Sessions and Meetings

Section 1. The Association shall hold an Annual Session, during which there shall be held daily not less than two general meetings, which shall be open to all registered members, delegates, and guests.

Section 2. The place for holding each annual session shall be fixed by the House of Delegates.

Section 3. The time of the annual session shall be fixed by the local society that entertains the session with the approval of the President of the State Association.

ARTICLE IX.

Officers

Section 1. The officers of this Association shall be a President, a President-elect, a First Vice-President, a Second Vice-President, a Secretary, a Treasurer, a Speaker of the House of Delegates, and ten Councillors.

Section 2. The President, President-elect, Vice-Presidents, Secretary, and Treasurer shall be elected annually by the House of Delegates to serve for a term of one year. The Councillors shall be elected by the House of Delegates annually to serve for a term of three years. All officers shall serve until their successors are installed.

Section 3. The Speaker of the House of Delegates shall be elected by the House of Delegates at its second session each year. He may, but need not be, elected from among the members of the House of Delegates.

ARTICLE X.

Funds and Expenses

Funds shall be raised by an equal per capita assessment on each component Society. The amount of the assessments shall be fixed by the House of Delegates.

ARTICLE XI.

Referendum

At any general meeting the Association may, by a two-thirds vote, order a general referendum upon any question pending before or passed by the House of Delegates, and the House of Delegates shall by a similar vote of its own members, or after a like vote of the general meeting, submit any such question to the membership of the Association for a final vote. A majority of the members voting shall decide the question and be binding on the House of Delegates.

ARTICLE XII.

The Seal

The Association shall have a common seal with power to break, change, or renew the same at pleasure.

ARTICLE XIII.

Amendments

The House of Delegates may amend any article of this constitution by a two-thirds vote of the delegates registered at the annual session, provided that such amendment shall have been presented in open meeting at the previous annual session, and has been published in the official journal of the association, and that it shall have been sent officially to each component society three months before the session at which final action has to be taken.

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B Y - L A W S

CHAPTER I.

Membership

Section 1. All members of the component societies in good standing shall be privileged to attend all meetings and take part in all of the proceedings of the annual sessions, and shall be eligible to any office within the gift of the Association.

Section 2. The name of a physician upon the properly certified roster of members, or list of delegates of a chartered local society which has paid its annual assessment, or a receipt for dues for the current year from the Secretary or Treasurer of the local society to which he belongs shall be prima facie evidence of his right to register at the annual session in the respective bodies of this Association.

Section 3. No person who is under sentence of suspension or expulsion from any component society of this Association, or whose name has been dropped from its roll of members, shall be entitled to any of the rights or benefits of this Association, nor shall he be permitted to take part in any of its proceedings until such time as he has been relieved of such disability.

Section 4. Each member in attendance at the annual session shall enter his name on the registration book, indicating the component society of which he is a member. No member or delegate shall take part in any of the proceedings of an annual session until he has complied with the provisions of this section.

Section 5. If the annual report and the per capita apportionment of any component society, are not received by the Secretary of the State Association for two consecutive years, then the charter of that society shall be automatically revoked, and the Secretary of the State Association shall notify the Secretary of such society to that effect.

CHAPTER II.

Annual and Special Sessions of the Association

Section 1. The Association shall hold an annual session at such place as has been fixed at the preceding annual session by the House of Delegates.

Section 2. Special sessions of either the Association or the House of Delegates shall be called by the President at his discretion or upon petition of twenty delegates.

Section 3. The fiscal year of this Association shall be from April first to April first of each year.

CHAPTER III.

General Meetings

Section 1. The general meetings shall include all registered members, delegates and guests who shall have equal rights to participate in the proceedings and discussions, and except guests, to vote on pending questions. Each general meeting shall be presided over by the President, or in his absence or disability, by the President-elect, or by one of the Vice-Presidents.

Before it, at such time and place as may have been arranged, shall be delivered the annual address of the President; and the entire time of the session, so far as may be, shall be devoted to papers and discussions relating to scientific medicine.

Section 2. The General Meeting may recommend to the House of Delegates, the appointment of committees or commissions for scientific investigation of special interest and importance to the profession and to the public.

Section 3. Except by special vote, the order of exercises, papers, and discussions as set forth in the official program shall be followed from day to day until it has been completed.

CHAPTER IV.

House of Delegates

Section 1. The House of Delegates shall meet annually at the time and place of the annual session of the Association, and shall so fix its hours of meeting as not to conflict with the first General Meeting of the Association, or with the meeting held for the address of the President, so as to give Delegates an opportunity to attend the scientific proceedings and discussions so far as is consistent with their duties. But if the business interest of the Association and profession require, the House of Delegates may meet in advance or remain in session after the final adjournment of the General Meeting.

Section 2. Each component society shall be entitled to send to the House of Delegates each year one delegate for every twenty-five members, and one for each major fraction thereof, but each district society holding a charter from this Association, which has made its annual report, and paid its assessment as provided in this Constitution and By-Laws, shall be entitled to one delegate. In case a regularly elected delegate or alternate is unable to attend the annual meeting of the Association, the Presiding Officer of the State Association may appoint a substitute from the local society who shall have the rights and privileges of the regular delegates.

Section 3. A majority of the registered delegates shall constitute a quorum, and all of the meetings of the House of Delegates shall be open to members of the Association.

Section 4. It shall, through its officers, Advisory Council, and otherwise, give diligent attention to and foster the scientific work and spirit of the Association, and shall constantly study and strive to make each annual session a stepping stone to further ones of higher interest.

Section 5. It shall consider and advise as to the material interest of the profession, and of the public in those important matters wherein the public is dependent upon the profession, and shall use its influence to secure and enforce all proper medical and public-health legislation, and to diffuse popular information in relation thereto.

Section 6. It shall make careful inquiry into the condition of the profession in the State, and shall have authority to adopt such methods as may be deemed most efficient for building up and increasing the interest in such local societies as already exist and for organizing the profession in counties where societies do not exist. It shall especially endeavor to promote friendly intercourse between physicians of the same locality, and shall continue these efforts until every reputable physician in every

county of the state has been brought under the medical society influence.

Section 7. It shall elect representatives to the House of Delegates of the American Medical Association in accordance with the Constitution and By-Laws of that body.

Section 8. It shall, upon application, provide and issue charters to district societies organized to conform to the spirit of the Constitution and By-Laws.

Section 9. In sparsely settled sections it shall have authority to organize the physicians of two or more counties, and such societies, when organized and chartered, shall be entitled to all the privileges and representation provided herein for district societies, until such counties may be organized separately.

Section 10. It shall divide the counties of the state into Councillor Districts.

CHAPTER V.

Election of Officers

Section 1. All elections shall be by ballot, and a majority of the votes cast shall be necessary to elect.

Section 2. On the first day of the annual session the President shall appoint a nominating committee of three.

Section 3. The report of the Nominating Committee and the election of officers shall be the first order of business of the House of Delegates, after the reading of minutes at the second session of the House of Delegates.

Section 4. Nothing in this article shall be construed to prevent additional nominations being made by members of the House of Delegates.

CHAPTER VI.

Duties of Officers

Section 1. The President shall preside at all meetings of the Association; shall appoint all committees not otherwise provided for; shall deliver an annual address at such time as may be arranged; and shall perform such other duties as custom and parliamentary usage may require. He shall be the real head of the profession of the state during his term of office, and, as far as practicable, shall visit by appointment the various sections of the state and assist the Councillors in building up the district societies, and in making their work more practical and useful. He shall be ex-officio a member of the Council and of all committees.

Section 2. The President-elect or one of the Vice-Presidents, when called upon, shall assist the President in the performance of his duties, and during his absence, or at the request of the President, one of them shall officiate in his place. In case of the death, resignation, or removal of the President, the vacancy shall be filled by the First Vice-President, and in case of his death, resignation, or removal, by the Second Vice-President.

Section 3. The Treasurer shall give bond in such sum as the Council shall demand, the cost of the same being paid by the Society. He shall demand and receive from the Secretary all funds collected by him. He shall make a financial report at each meeting of the Council. He shall make an annual report upon the completion of the audit. He shall submit his accounts to such examination as the Council may order. He shall pay out money from the Treasury only upon properly executed vouchers.

Section 4. The Secretary shall attend the general meetings of the society and the meetings of the House of Delegates, and shall keep minutes of their respective proceedings in separate record books. He shall be Custodian of all record books and papers belonging to the Society, except such as properly belong to the Treasurer, and shall keep account of and turn over monthly to the Treasurer all funds of the Society which come into his hands. He shall provide for the registration of the members and delegates at the annual sessions. He shall, with the coöperation of the secretaries of the component societies, keep a card-index register of all the legal practitioners of the state by counties, noting on each his status in relation to his local society, and on request, shall transmit a copy of this list to the American Medical Association. He shall aid the Councillors in the organization and improvement of the local societies and in the extension of the power and usefulness of this Society. He shall conduct the official correspondence, notifying members of meetings, officers of their election, and committees of their appointment and duties. He shall employ such assistants as may be ordered by the Council. The Secretary's report shall cover the fiscal year. He shall supply each component society with the necessary blanks for making their annual report; shall keep an account with the component societies, charging against each society its assessment, collect the same, and at once turn it over to the Treasurer. Acting with the committee on scientific work, he shall prepare and issue all programs. The amount of his salary shall be fixed by the Council. He shall give bond in such sum as the Council may demand, such bond to be procured from some reliable security company by the Council and to be approved by the Council. The expense of such bond shall be paid by the State Association.

Section 5. The Speaker of the House of Delegates shall preside at the meetings of the House of Delegates and shall perform such duties as custom and parliamentary usage require of a Presiding Officer. He shall have the right to vote only when his vote shall be the deciding vote.

CHAPTER VII.

The Council

Section 1. The Council shall hold daily meetings during the annual session of the Association and at such other times as necessity may require, subject to the call of the chairman or on petition of three Councillors. It shall meet on the last day of the annual session of the Association for reorganization and for outlining the work for the ensuing year. At this meeting it shall elect a Chairman and Secretary and it shall keep a permanent record of its proceedings. It shall, through its Chairman, make an annual report to the House of Delegates at such times as may be provided, which report shall include an audit of the accounts of the Secretary and Treasurer and other agents of this Association, and shall also specify the character and cost of all the publications of the Association during the year, and the amount of all other property belonging to the Association or under its control, with such suggestions as it may deem necessary. In the event of a vacancy in any elective office the Council may fill the same until the next annual election.

Section 2. Each Councillor shall be organizer, peacemaker, and censor for his district. He shall visit each county in his district at least once a year for the purpose of organizing component societies where none exist, for inquiring into the condition of the profession, and for improving and increasing the zeal of the district societies and their members. He shall make an annual report of his doings and of the condition of the profession of each county in his district, to each annual session of the House of Delegates. The necessary traveling expenses incurred by such Councillor in the line of the duties herein imposed may be allowed by the House of Delegates upon a properly itemized statement, but this shall not be construed to include his expense in attending the annual session of the Association.

Section 3. Collectively the Council shall be the Board of Censors of the Association. It shall consider all questions involving the rights and standing of members, whether in relation to other members, to the component societies or to this society. All questions of an ethical nature brought before the House of Delegates or the general meeting shall be referred to the Council without discussion. It shall hear and decide all questions of discipline affecting the conduct of members or of a district society, upon which an appeal is taken from the decision of an individual Councillor. Its decision in all such cases shall be final.

Section 4. The Council shall provide for and superintend the publication and distribution of all proceedings, transactions, and memoirs of the Association, and shall have authority to appoint such assistants as it deems necessary.

Section 5. All commercial exhibits during the annual sessions shall be within the control and direction of the Council.

CHAPTER VIII

Committees

No expenses shall be incurred by any committee or committeemen without first having received proper authority from the Council.

The standing committees of the North Dakota State Medical Association shall be as follows:

1. A Committee on Scientific Program.
2. A Committee on Arrangements for the Annual Meeting.
3. A Committee on Medical Education.
4. A Committee on Necrology and Medical History.

5. A Committee on Public Policy and Legislation.
6. A Committee on Public Health.
7. A Committee on Tuberculosis.
8. Editorial Committee on Official Publication.
9. A Committee on Cancer.
10. A Committee on Fractures.
11. A Committee on Medical Economics.
12. A Committee on Maternal and Child Welfare.
13. A Committee on Crippled Children.
14. A Committee on Radio.
15. A Committee on Venereal Diseases.
16. A Committee on Pneumonia.

New committees may be formed and filled in case of emergency by the President.

Section 1. The Committee on Scientific Program shall consist of the President and Secretary and three members appointed by the President from the local society where the annual meeting is to be held. It shall determine the character and scope of the scientific proceedings of the society, subject to the provision of the instruction of the House of Delegates or of the Association, or to the provisions of the Constitution and By-Laws. Thirty days previous to each annual session it shall prepare and issue a program announcing the order in which papers, discussions, and other business shall be presented, which shall be adhered to by the Society as nearly as practicable.

Section 2. The Committee on Arrangements shall consist of the local society in the territory in which the annual session is to be held. It shall, by committees of its own selection, provide suitable accommodations for the meeting places of the Association and of the House of Delegates, of the Council, and of their respective committees, and shall have general charge of all arrangements. Its chairman shall report an outline of the arrangements to the Secretary for publication in the program, and shall make additional announcements during the session as occasion may require.

Section 3. The Committee on Medical Education shall consist of three or more members appointed by the President. The function of this committee shall be: (1) to coöperate with the State Medical Examining Board in matters pertaining to medical education; (2) to make an annual report to the House of Delegates on the existing condition of medical education in the state; (3) to coöperate with the Council on Medical Education of the American Medical Association in the effort to regulate the standard of medical education in the United States.

Section 4. The Committee on Public Policy and Legislation shall consist of three or more members appointed by the President, and the President and Secretary ex-officio. Under the direction of the House of Delegates it shall represent the Society in securing and enforcing legislation in the interest of Public Health and scientific medicine. It shall keep in touch with professional and public opinion, shall endeavor to shape legislation so as to secure the best results for the whole people, and may utilize every organization and influence in local, state, and national affairs and elections. Its work shall be done with dignity becoming a great profession and with that wisdom which will make effective its work and influence. It shall have authority to be heard before the entire Society upon questions of great concern.

Section 5. The Editorial Committee on official publication shall be appointed by the Council.

CHAPTER IX.

Assessments and Expenditures

Section 1. The assessment of $10.00 per capita on the membership of the component societies unless otherwise ordered by the House of Delegates, is hereby made the annual dues for this Association. The Secretary of each district society shall forward its assessment together with its roster of all officers and members, list of delegates, and list of non-affiliated physicians of the county or district to the secretary of this society, not later than the first day of March in each year.

Section 2. Any district society which fails to pay its assessment, or make the report required, on or before the first day of April in each year, shall be held as suspended, and none of its members or Delegates shall be permitted to participate in any of the business or proceedings of the Society or of the House of Delegates until such requirements have been met.

Section 3. All motions or resolutions appropriating money shall specify a definite amount or so much thereof as may be necessary for the purpose indicated, and must be approved by the Council.

CHAPTER X.

Rules of Conduct

The principles set forth in the Principles of Ethics of the American Medical Association shall govern the conduct of members in their relation to each other and to the public.

CHAPTER XI.

Rules of Order

The deliberations of this Society shall be governed by parliamentary usage as contained in *Robert's Rules of Order*, unless otherwise determined by a vote of its respective bodies.

CHAPTER XII.

District Societies

Section 1. All district societies now in affiliation with the State Association or those that may hereafter be organized in this state which have adopted principles of organization not in conflict with this Constitution and By-Laws, shall, upon application to the House of Delegates, receive a charter from, and become a component part of this Association.

Section 2. Charters shall be issued only upon approval of the House of Delegates, and shall be signed by the President and the Secretary of this Association. The House of Delegates shall have authority to revoke the charter of any component district society whose actions are in conflict with the letter or spirit of this Constitution and By-Laws.

Section 3. Only one component medical society shall be chartered in each county.

Section 4. Each district society shall judge of the qualifications of its own members, but as such societies are the only portals to this Association and to the American Medical Association, every reputable and legally registered physician who is practicing or will agree to practice non-sectarian medicine shall be entitled to membership. Before a charter is issued to any district society full and ample notice and opportunity shall be given to every such physician in the county or district to become a member.

Section 5. Any physician who may feel aggrieved by the action of the society of his county in refusing him membership, or in suspending or expelling him, shall have the right of appeal to the Council.

Section 6. In hearing appeals the Council may admit oral or written evidence as in its judgment will best and most fairly present the facts; but in case of every appeal, both as a Board and as individual Councillors in the district, efforts at conciliation and compromise shall precede all such hearings.

Section 7. When a member in good standing in a component society moves to another district in this state, his name, upon request, shall be transferred without cost to the roster of the local society into whose jurisdiction he moves.

Section 8. A physician may hold his membership in that local society most convenient for him to attend, provided no objection is made by the society in whose jurisdiction he resides.

Section 9. At its annual election of officers, each local society shall elect a delegate or delegates, and alternates, to represent it in the House of Delegates of this Association, in the proportion of one delegate to each twenty-five members or major fraction thereof, and the secretary of the local society shall send a list of such delegates and alternates to the Secretary of this Association at least sixty days before the annual session of this Association.

Section 10. The Secretary of each local society shall keep a roster of its members and a list of non-affiliated registered physicians of the district in which shall be shown the full name, address, college and date of graduation, date of license to practice in this state, and such other information as may be deemed necessary. He shall furnish an official report containing such information, upon blanks supplied to him for the purpose, to the Secretary of this Association on or before March first of each year. In keeping such roster the local secretary shall note any change in the personnel of the profession by death, or by removal, to or from the district, and in making his annual report he shall be certain to account for every physician who has lived in the district during the year.

CHAPTER XIII.

Amendments

These By-Laws may be amended at any annual session by a majority vote of all the delegates present at that session, after the proposed amendments have laid upon the table for one session, provided that any such amendment be introduced in writing at the First Session and acted upon at the last session.

ORDER OF BUSINESS OF THE HOUSE OF DELEGATES

First Session

1. Call to Order
2. Report of Committee on Credentials
3. Roll Call
4. Reading of Minutes of the Last Meeting
5. Report of the Secretary
6. Report of the Treasurer
7. Report of the Chairman of the Council
8. Reports of the Councillors
9. Reports of the Standing Committees
10. Report of the Delegate to the American Medical Association
11. Reports of Special Committees
12. Fixing the per capita dues for the ensuing year
13. Appointment of Nominating Committee
14. Adjournment

Second Session

1. Roll Call
2. Minutes of the last meeting
3. Election of Officers
4. Selection of meeting place for the next annual session
5. Unfinished Business
6. New Business
7. Resolutions
8. Adjournment

President BRANDES: Dr. Williamson will report the changes to the Constitution and we can discuss them very briefly here, and then this report will be turned over to the Committee, and you can meet with them at the close of this session, to give you an opportunity to go over this Constitution to get it in proper form to be submitted tonight.

Dr. WILLIAMSON: Starting with Page 1, Article II, to *elevate* the standard of medical education, put in there *regulate* the standard of medical education, etc.

Article IV, Page 1, Section 3. Associate Members; change it to *District* instead of *County*.

Page 2, Article V. If you look over the old Article V, I think it is better than the one suggested by the Council at their meeting in Fargo. This is a small Society. There are just 19 Delegates. We have been running along for many years on this old plan, and I think we should follow this plan.

Page 2, Article VI, Section 1. The Council shall be the Executive Body of the Association, and shall consist of (add the words *not more than*) ten councillors elected by the House of Delegates.

Page 4, Article IX, Section 3. The Speaker of the House of Delegates shall be elected by the House of Delegates at its second session each year. He may, but need not be, elected from among the members of the House of Delegates.

Then in the By-Laws, Chapter I, Section 1. All members of the component societies *in good standing* shall be privileged to attend all meetings and take part in all of the proceedings of the annual sessions, and shall be eligible to any office within the gift of the Association.

Page 6, Chapter II, Section 3. The fiscal year of this Association shall be from April first to April first of each year. At the bottom of Page 6, Chapter IV, Section 2, strike out the words *County or District*.

Page 7, Section 6, strike out the words *of each county*, and in Section 8, page 7, strike out the words *county or*.

Page 8, Chapter VI, Section 1, seventh line, change the word *County* to *District*. Section 2, Chapter VI, Page 8, fifth line, *the vacancy shall be filled by the First Vice-President, and in case of his death, resignation, or removal, by the Second Vice-President*.

Page 9, Section 4. He shall employ such assistants as may be ordered by the Council or House of Delegates. Strike out the last four words—*or House of Delegates*.

Page 10, Chapter VII, Section 2; fifth line; strike out the words *county or*.

Page 11, Chapter VIII. No expenses shall be incurred by any Committee or Committeeman without first having received proper authority from the Council.

Now it has been suggested that some of the committees might be combined. That is a thing we have gone over, and I think the fewer committees we have, the better off we will be. Now if all the committees were functioning like the Committee on Maternal and Child Welfare, and take the same interest as that Committee, we would get along a little better. Some of the other committees are functioning good too. Why couldn't the Committee on Crippled Children be combined with Maternal and Child Welfare?

Secretary SKELSEY: Page 11, Chapter VIII. Standing Committees. Committee on Constitution and By-Laws. Do we have to have that in our By-Laws?

Dr. WILLIAMSON: We don't need that Committee after this. Page 12, Section 1. That section is eliminated because the Council takes over those duties.

Page 13, Section 5. The Editorial Committee on the JOURNAL-LANCET shall be appointed by the Council. Change this to read *The Editorial Committee on Official Publicity shall be appointed by the Council.*

Page 11, Chapter VIII. Change numbering of committees. Executive Committee being stricken out.

Dr. MACLACHLAN: The Committee on Crippled Children and the Committee on Maternal and Child Welfare; why couldn't we have them as one Committee?

President BRANDES: They are two different departments in our State Government. Maternal and Child Welfare is under the Board of Public Health, whereas the Crippled Children is under the Welfare Board.

Dr. WILLIAMSON: Page 14, Chapter IX, Section 1, shall read as follows: *The assessment of $10.00 per capita on the membership of the component societies unless otherwise ordered by the House of Delegates is hereby made the annual dues for this Association. The Secretary of each District Society shall forward its assessment together with its roster of all officers and members, list of delegates and list of non-affiliated physicians of the County or District to the Secretary of this Society, not later than the first day of March in each year.*

Page 14, Chapter XII. Change *County* Societies to *District* Societies.

Page 15, where *county society* appears, change to *District Societies*.

Dr. WOUTAT: The Members of the Grand Forks Medical Society studied this Constitution and By-Laws and made certain recommendations, and they were approved by the Society. We have gone to quite a little work; Dr. Fawcett and Dr. Williamson; and it is a thing we don't want to have to change again in two years, and I think any suggested change should be considered very carefully and thought over with plenty of time, rather than rush it through.

President BRANDES: Is there anything further to present at this time? I do not see anything, Dr. Williamson, under the order of business covering the appointment of a Reference Committee, or of a Nominating Committee.

Dr. WILLIAMSON: That would come under Special Committees.

President BRANDES: This report on the proposed changes will be referred to a Committee, and that Committee will consist of: Dr. G. M. Williamson, chairman; Dr. P. H. Woutat, Dr. C. C. Smith, Dr. H. O. Grangaard.

Dr. MACLACHLAN: Before that report is turned over to the Committee, wouldn't it be well for the Committee to have the opinion of the Councillors, so there wouldn't be much discussion again on the floor, and their work will be pretty largely disposed of

President BRANDES: These other two committees have to get to work. I hoped you could meet with this Committee and iron that out before they came back here.

Dr. WILLIAMSON: If the fellows who have any objections will come to the meeting, we will thresh it out there, and then there will be no arguments when we come back here this evening. Now don't forget to come to the meeting and then don't argue when we bring the report in.

President Brandes: All of the reports are in, except the one on Fractures and Venereal Diseases. The last report is that of the Committee on Scientific Program.

Dr. McCannel: I submit a printed program and move its adoption.

Delegate: Second.

The motion prevailed.

President Brandes: I want to thank you, Dr. McCannel and your co-workers, for the fine program provided for us. We deeply appreciate all you have done.

President Brandes: Are there any reports of Special Committees?

Secretary Skelsey: Have you the report of the Auditing Committee?

Dr. Ramstad: The report has not yet come before the Council and has not been audited.

President Brandes: That is my understanding. There should be a Resolution Committee appointed, and I am going to appoint Dr. Chas. MacLachlan and Dr. Benson on that Committee.

Place of Next Annual Meeting

President Brandes: This is the time we can receive invitations for our next annual meeting.

Dr. MacDonald: I have been instructed by the Sheyenne Medical Society to extend you an invitation to select Valley City as your next meeting place, and in connection with that, the Secretary has in his hands, a communication from the Mayor and Civic and Commerce Associations which he can read.

Dr. Liebeler: The Grand Forks Medical Society wishes to offer Grand Forks as your next meeting place.

Dr. W. W. Wood: Last year we went on record in placing our invitation for 1942, and we are looking for you at Jamestown in 1942, because we figure that year Dr. Fergusson will be in the Chair, and I want to keep that in the records "we are looking for you in 1942."

Dr. Williamson: We sort of understood some years ago we were to go East and West, and West and East. We were in Fargo last year and here in Minot this year, and we should go back East next year to Grand Forks. We would be very glad to have you come to Grand Forks.

Secretary Skelsey read the letter of Mayor Fredrickson of Valley City, inviting the Association to meet in Valley City next year.

President Brandes: We have two invitations for our meeting for 1941. If there is no objection we will ballot at this time. (Ballots passed). Result of balloting: Grand Forks received 13 votes and Valley City, 10 votes.

President Brandes declared that Grand Forks had received a majority of the votes cast and that the 1941 meeting of the Association would be held in Grand Forks.

Dr. Wicks: We would like to go on record now and place our invitation for the Association to meet at Valley City in 1943.

President Brandes: I see Dr. Darrow is here. Will you please give us your report of the Committee on Venereal Diseases.

Dr. Darrow read the report on Venereal Diseases.

Committee on Venereal Diseases

There has been some venereal disease control in North Dakota considered as a public health problem ever since the law was passed making venereal diseases reportable.

In September, 1937, the Venereal Disease Committee of the North Dakota State Medical Association made a report giving fifteen recommendations for the control of Venereal Diseases. In May, 1938, the United States Congress passed a Venereal Disease control act which made available a small sum for the control of venereal disease in North Dakota.

Since this time various meetings have been held by the North Dakota State Medical Association's Committee on Venereal Diseases, with the North Dakota Department of Public Health; the Committee acting in an advisory capacity. From the beginning, the problem has been considered under five headings, namely:

I. Public Health (Units of Government—State, County, City, etc.)
II. Public Charge (Indigent Persons).
III. Private Patient.
IV. Medical Societies.
V. Individual Physicians.

The success of any plan requires a correlation of all these factors and any complete discussion should include them. I have been asked to report on the Public Health angle so, because of limited time, will necessarily leave much unsaid.

(Slide)

This shows the North Dakota Department of Public Health's Venereal Disease program in outline under 10 headings; Numbers 1 and 2 may be worked out by the individual physician, or usually by request by the local health officer or county nurses under the direction of the Public Health Department.

Number 3: Consultants have been designated in various localities and their services may be had by any physician desiring them.

Number 4: Free drugs for the treatment of syphilis may be had by sending in a designated form and reporting the use of them.

Numbers 5 and 6: Laboratory facilities for serological and microscopic as well as dark field tests, are available at the State Laboratories in Bismarck and Grand Forks. Recently special venules for the collection of blood specimens have been sent out to all physicians in the state.

Number 7: At the last session of the North Dakota legislature a law was passed requiring a premarital serological test for syphilis as a part of the health examination before a marriage license may be issued. Out of 5362 serological tests done on premarital applicants, from July 1, 1939, to March 31, 1940, there were 25 positive reports or 0.47 per cent of the tests gave positive reactions. The number of marriages in North Dakota has not been materially affected by the new marriage law.

Number 8: Health education in venereal diseases and venereal disease education campaigns during Social Hygiene Month. Between 100 and 125 local community organizations had special meetings throughout the state. Talks were broadcast on all the radio stations; notable was a talk by Mr. A. J. Nuessle, Chief Justice of the Supreme Court of North Dakota, on February 1, 1939.

Number 9: Postgraduate education in venereal diseases. Through the coöperation of the University of Minnesota Continuation Study Courses, a special course was given to North Dakota physicians the first week in April of this year. Physicians from all parts of the state were in attendance without expense to themselves. Their selection was made by the local medical society units.

Number 10: The chemical control plan. Two plans have been used, both being essentially the same with the exception that the fee paid for reporting cases from April, 1939, to November, 1939, was 50 cents and from November, 1939, one dollar. Under this plan the cases admitted to treatment are:

1. *Syphilis.* It is the intent of this plan to encourage the physicians to maintain contact with all cases of syphilis which are of public health significance—by this is meant (1) primary and (2) secondary syphilis (3) early latent syphilis of less than four years duration which has not received the advised minimum therapy (20-20) and (4) syphilis in pregnancy. The venereal disease control officer must be satisfied that a case belongs in one of the above classifications before authorization for control payments can be given.

2. *Gonorrhea.* Laboratory confirmation of the diagnosis of gonorrhea must be obtained from the State Public Health laboratories, or a laboratory approved by the State Department of Health before control payments can be authorized. For the sake of completeness I give the instructions for procedure for obtaining control payments.

The physician who wishes a control stipend for the care of an infectious case of syphilis or gonorrhea should proceed as follows:

1. Report case on official report form.
2. On reverse side of the report card, under drugs, check the statement "Patient infectious, control payments requested."
3. When the control payments are authorized, a book of Weekly Activity Reports (Form PD53) will be sent.

When the patient appears for his weekly treatment, the original (white) and carbon copy (pink) will be filled out and signed by the patient. The stub at the right side of the form will be detached and given the patient. (This is his receipt to show that he has not been delinquent in treatment). At the end of the month, the physician will sign these forms and forward the carbon (pink) copies to the State Department of Health for payment. The monthly control stipend will then be sent the physician.

(Slide)

Table I shows that during April, May and June, 1939, when the chemical control plan went into effect, the number of cases of syphilis reported to the State Department of Health increased somewhat: an average of 34 cases having been reported during this period as compared to an average of 28 cases during the first three months of the year. However, physicians did not extensively avail themselves of the control plan, and it was felt that this method had not adequately stimulated the reporting of syphilis.

At a meeting of the Venereal Disease Control Committee on October 8, 1939, the Committee was asked by the State Department of Health to consider the possibility of continuing the syphilis control program which had been introduced in April. The Committee believed that the chemical control plan should be continued, but suggested that control fees be raised from 50 cents to one dollar. Because of the difficulty of keeping gonorrhea patients under treatment, the Committee also recommended that this disease be included in the control plan; and that physicians be paid a control fee for keeping each case of gonorrhea under medical control. A fee of $1.00 was suggested for each patient activity report per week up to ten weeks. Because of limited funds, this time had to be limited.

From Table I, it is seen that the number of cases reported, beginning in November, when the revised program went into effect, almost doubled.

The venereal disease control plan is aimed at the control and treatment of infectious cases only. By bringing this type of case under the control plan, each infectious case of syphilis would be assured of receiving a minimum of 20 injections of an arsenical and 20 of a heavy metal. This amount of therapy is believed to render the patient permanently non-infectious.

(Slide)

Table II shows that when the plan went into effect in April, 1939, it was estimated that 68 per cent of the infectious cases were brought under treatment during the first quarter that the plan was in effect. However, this number dropped to 50 per cent. Following the revision of the control plan in November, 1939, the per cent of infectious cases brought under chemical control rose to 85 per cent during October, November and December, and increased to 91 per cent during the first three months of this year. Since a number of the infectious cases of syphilis are in Indians, who are wards of the government and not eligible to come under the chemical control plan, this percentage will never become 100 per cent. By having over 90 per cent of our infectious cases under chemical control, it is felt that the spread of syphilis will be markedly curtailed in North Dakota.

(Slide)

Table III suggests that the control plan has stimulated the reporting of syphilis. In a five-year average for the years 1934 to 1938 inclusive, 317 cases were reported; 366 cases of syphilis were reported in 1939.

(Slide)

Table IV shows that the number of physicians requesting antisyphilitic drugs was increased from 78 physicians in 1937 to 146 in 1939.

The revised venereal disease control plan; which included control of gonorrhea, and which went into effect in November, 1939; was aimed at stimulating the reporting of this disease.

(Slide)

Table V shows that when the plan went into effect in November, the number of cases reported immediately jumped up from 41 and 35 in September and October respectively, to 51 and 51 in November and December respectively. However, the number of cases reported has slumped back during January February and March.

(Slide)

Table VI shows the number of cases of gonorrhea being treated under the control plan. When the control plan went into effect in November, 1939, 31 per cent of the reported cases came under control. This has increased somewhat. In March, 1940, 40 per cent of the reported cases were being treated under the chemical control plan.

It is clear that with the last control plan in force only six months no certain conclusions as to its effects can be reached. It would seem that the trend of its effect was beneficial. From the standpoint of criticism or suggestion it might be said that a plan to insure that every measure be taken to prevent central nervous system syphilis, be included as a public health function. These cases so frequently become public charges.

FRANK I. DARROW, M.D.,
Chairman.

President BRANDES: Any recommendations to be made for the coming year for the House to pass on?

Dr. DARROW: I don't think there are any special recommendations that the House needs to pass on.

President BRANDES: The Committee on Revision of Constitution and By-Laws will meet here in the balcony immediately after the close of the Council's meeting at four o'clock, and any Delegates or any members of the Society who have any amendments to make, please meet with that Committee so that you can have these ironed out. The Reference Committee will meet in the Community Room of the First National Bank, and the Committee on Reorganization of the Secretary's office will meet in this room at the close of the Council's meeting.

RESOLUTIONS

Resolution From Kotana Medical Society

Secretary Skelsey read the Resolution from the Kotana Medical Society:

The Kotana Medical Society, at its meeting of April 18, 1940, unanimously adopted the following resolution and wished to have it presented to the North Dakota State Medical Association Committee on Medical Economics at the annual meeting held in Minot on May 6, 1940.

WHEREAS, The members of the Kotana Medical Society are practicing in a community very much influenced by adverse economic conditions, and

WHEREAS, The number of dependent patients is steadily increasing, and

WHEREAS, The members of the medical profession are rendering their services without remuneration in many cases;

THEREFORE, The Kotana Medical Society, with the consent of the North Dakota Medical Association, wished to negotiate with the Farm Security Administration for some health program to relieve the distress of this community.

The following stipulations are to be kept in mind at these negotiations.

First. That the Farm Security Administration allow a greater number of its clients to be eligible for loans to enter into this health program.

Second. That Thirty-Three Dollars per year per family be the minimal fee for medical attention.

Third. That the Farm Security Administration be entrusted with the collection of all monies.

Fourth. That the Kotana Medical Society, sitting as a group, be empowered to see that the monies are properly administered.

Fifth. That the district to be administered by the Kotana Medical Society be extended to include Williams and McKenzie counties.

Signed:
H. T. SKOVHOLT, M.D., President.
J. J. KORWIN, M.D., Secretary.

Resolution From Sheyenne Valley Medical Society

Secretary Skelsey read the Resolution from the Sheyenne Valley Medical Society:

The following resolution is hereby unanimously adopted by the undersigned, consisting of all of the members of the Sheyenne Valley Medical Society.

WHEREAS, for a period of approximately two years, the Fraternal Order of Eagles, conducting a lodge in the area of Valley City, North Dakota, has sought to provide medical services to its members by the employment of an area physician

and pursuant thereto, have secured the employment of a member of the Sheyenne Valley Medical Society, and,

Whereas, since the time of the inception of said practice, the Sheyenne Valley Medical Society has been unanimously opposed to said practice with the exception of its member so employed, for the reason that the promulgation of such a practice is contrary to and opposed to Chapter three, Article 6, Section 2 of the Code of Ethics of the American Medical Association, and,

Whereas, each of the undersigned members of the Sheyenne Valley Medical Society have, by reason of said Code of Ethics, refused to accept such employment and do hereby refuse to accept such employment or permit any of its members in the future to accept such employment except in accordance with the Code of Ethics of the American Medical Association, and,

Whereas, said Code of Ethics provides, among other things, that it is unprofessional for a physician to dispose of his services under conditions that make it impossible to render adequate services to a patient, or which interfere with reasonable competition among the physicians of a community, and deprive the individual patient of the choice of his individual physician; and does further provide that the term contract practice as provided in said Code of Ethics, shall be defined to mean the carrying out of an Agreement between a physician or a group of physicians as principals, or agents, and a corporation, organization or individual to furnish partial or full medical services to a group or class of individuals for a definite sum or a fixed per capita rate; and does further provide that such contract practice is unethical where it directly or indirectly involves the solicitation of patients, the underbidding to secure the contract, the inadequacy of the compensation to assure good medical services, the interference with reasonable competition in a community, the inability under the conditions of employment which make it impossible to render adequate services to the patient, and the most important of which is *the prevention of a free choice of a physician by the patient.*

Now, Therefore, we and each of us, do hereby firmly resolve that we shall not accept any such contract employment by the Fraternal Order of the Eagles, or any other like organization or society, and will not allow any future member of our society to accept such employment except and unless such employment is based upon conditions where:

1. Adequate compensation is provided so that in the opinion of this society, adequate professional services can be rendered to the patient, and
2. Allowing each individual member patient the absolute right of the selection of his own physician.

That this resolution is passed and approved, not for the purpose of in any way affecting or interfering with the membership of any particular Lodge, organization or society, but for the sole purpose of complying with the standards of ethical practice as defined by the American Medical Association, and to which each member is ethically and professionally bound.

That in addition thereto, this resolution is adopted in the light of the law announced by the Courts of the State of Minnesota and its definition of unethical practice under the Code of practice of the American Medical Association.

Dated this 25th day of November, A. D. 1939.

SHEYENNE VALLEY MEDICAL SOCIETY:

By A. W. Macdonald, President	C. A. Platou
Attest: C. J. Meredith, Secretary	Wm. Campbell
A. C. MacDonald	F. L. Wicks
J. Van Houten	M. D. Westley
F. Brown	L. Almklov

(Members)

President Brandes: Our Constitution provides that this Resolution, which is a question on Ethics, be referred to the Council and their decision is final.

Secretary Skelsey: As I recall, the Council approved that Resolution, and I was asked to bring it before the House of Delegates.

President Brandes: We will adjourn now, and will meet in this room this evening at 7:40.

(Second meeting of the House of Delegates adjourned at 3:45 P. M., May 6, 1940.)

THIRD MEETING of the HOUSE OF DELEGATES

The Third Session of the House of Delegates was called to order by the President, Dr. H. A. Brandes, at 7:45 P. M., Monday, May 6, 1940, in the Masonic Temple, Minot, North Dakota.

President Brandes: I will ask the Secretary to call the roll.

Secretary Skelsey called the roll, and the following officers, councillors, delegates and alternates responded:

Doctors:

H. A. Brandes, Bismarck
A. W. Skelsey, Fargo
W. W. Wood, Jamestown
A. Carr, Minot
F. W. Fergusson, Kulm
C. E. Stackhouse, Bismarck
W. F. Sihler, Devils Lake
A. E. Spear, Dickinson
G. M. Williamson, Grand Forks
N. O. Ramstad, Bismarck
A. D. McCannel, Minot
F. L. Wicks, Valley City
Chas. MacLachlan, New Rockford
A. C. Fortney, Fargo
P. H. Burton, Fargo
H. W. Miller, Fargo
B. Hughes, Rolla
W. A. Wright, Williston
W. A. Liebeler, Grand Forks
P. H. Woutat, Grand Forks
A. L. Cameron, Minot
H. O. Grangaard, Ryder
A. W. Macdonald, Valley City
O. T. Benson, Glen Ullin
C. C. Smith, Mandan
G. B. Ribble, LaMoure
A. P. Nachtwey, Dickinson
A. A. Kjelland, Hatton
P. A. Boyum, Harvey

The President declared a quorum present and the House duly constituted for the transaction of business.

President Brandes: We will start in with the report of the Reference Committee. Dr. Liebeler, will you report at this time?

Dr. Liebeler: Your Reference Committee met in the Community Room of the First National Bank of Minot, on this 6th day of May, 1940, at four o'clock P. M.

Your Committee examined the report of the Secretary, Dr. Skelsey, and recommend its adoption. The Committee feels that the Secretary should be unanimously commended for his very excellent effort during the past year.

We submit this portion of our report, and move its adoption.

Dr. Nachtwey: I second the motion.

The motion prevailed.

Dr. Liebeler: The resolution as submitted by the Kotana Medical Society was thoroughly reviewed and discussed. It is the opinion of your Reference Committee that the content of this resolution is similar to a resolution which will follow. If there is no objection, we will pass on?

Dr. Nachtwey: I am not familiar with that Resolution.

Dr. Liebeler: It has reference to Medical Economics.

(Secretary Skelsey read the Resolution from the Kotana Medical Society.)

Dr. Liebeler: The Reference Committee didn't recommend the adoption of this resolution at this time, as it is the opinion of the committee that the content of this resolution is similar to a resolution which will follow.

Dr. Liebeler: The report of Dr. G. M. Williamson, Councilman from the Third District recommending "the exchange of programs between different societies in our own state might be arranged to advantage. Local problems and mutual understandings pertaining to efforts in our State Society could be more widely discussed." Your committee highly recommends this suggestion. Your committee feels that the Councillors have shown a keen interest in their various districts, and their reports have been studious and concise and well presented. Fur-

ther cooperation of the Societies through their Councillors is highly recommended. We submit this further portion of our report and move its adoption.

Dr. NACHTWEY: Second.

The motion prevailed.

Dr. LIEBELER: The report of the Delegate to the American Medical Association, Dr. A. P Nachtwey, was received and your Committee feels he gave a very comprehensive report and recommend its adoption. It has been noted that Dr. Nachtwey's activity has been recognized and that he was placed on the Reference Committee by the American Medical Association. We submit this portion of our report, and move its adoption.

Dr. BURTON: Second.

The motion prevailed.

Dr. LIEBELER: The report of the Committee on Public Policy and Legislation as reported by Dr. L. W. Larson was reviewed and recommended for adoption, and I now move its adoption.

Dr. NACHTWEY: Second.

The motion prevailed.

Dr. LIEBELER: Your Reference Committee reports that there is no report from the Executive Committee, and that the President so announced.

The report of the Committee on Medical Education as submitted by Dr. H E. French, chairman, was read by Dr. Skelsey, secretary. Dr. French stressed the necessity of continued cooperation with this Society and the Legislators in securing greater funds with which to continue and enlarge the present Medical School in order to regain its former standing. Your committee recommends said report, and I move its adoption.

Dr. WICKS: I second the motion.

The motion prevailed.

Dr. LIEBELER: The report of the Committee on Necrology by Dr. James Grassick, chairman, as read by Dr. Skelsey, was reviewed. Your committee feels that the sentiments as expressed from the floor, together with the report be recommended for adoption, and I move its adoption.

Dr. NACHTWEY: Second.

The motion prevailed.

Dr. LIEBELER: The report of the Committee on Medical History as given by Dr. Williamson is recommended for adoption. This committee wishes to encourage the purchase of the few remaining excellent volumes as written by the Chairman, and that the House of Delegates announce to their component societies that these volumes are still available. I submit this portion of our report and move its adoption.

Delegate: Second.

The motion prevailed.

Dr. LIEBELER: The report of the Committee on Public Health by Dr. Maysil Williams, chairman, as read by Dr. Skelsey, was reviewed and your committee recommends its adoption. The committee further commends the efforts of the chairman in her unceasing vigilance with this work and the splendid cooperation she has given to the medical profession. Your committee further recommends that the resolutions in the report as given, be given whole-hearted cooperation. I move the adoption of this portion of our report.

Dr. NACHTWEY: I second the motion.

The motion prevailed.

Dr. LIEBELER: The report of the Editorial Committee of the JOURNAL-LANCET presented by Dr. J. O Arnson, as read by Dr. Skelsey, is recommended for adoption, and I move its adoption.

Delegate: Second

The motion prevailed.

Dr. LIEBELER: The report of the Committee on Cancer Survey read by Dr. L. W. Larson, chairman, is commended, and we recommend its adoption. Your committee especially commends Dr. Larson for his cooperation with the Women's Field Army, which we feel is a direct step forward in the educational problems of Cancer Control. I submit this portion of our report, and move its adoption.

Dr MACDONALD: Second

The motion prevailed.

Dr. LIEBELER: The report of the Committee on Tuberculosis by Dr J O Arnson, acting chairman, as read by Dr. Skelsey, is recommended for adoption, and I move its adoption.

Dr. KJELLAND: I second the motion.

The motion prevailed.

Dr. LIEBELER: The report of the Committee on Medical Economics submitted by Dr. W. A. Wright, chairman, was reviewed and is recommended for adoption. Your committee further recommends that the Supplement of the Relations between the F.S.A. and the North Dakota State Medical Association as submitted, be placed on file and not printed in the JOURNAL-LANCET. I submit this portion of our report, and move its adoption.

President BRANDES: I think it might be well to just review the recommendations made by Dr. Wright in that report.

Dr. LIEBELER: With your permission, may I ask Dr. Wright to present them again; he is more familiar with them than I am.

Dr. WRIGHT: 1. We recommend that present F.S.A. proposals be studied further by the committee.

2. We would ask that your committee receive authority from the House of Delegates to enter into an agreement with the F.S.A for either a state-wide or local program as the committee may deem advisable, subject to the approval of the executive committee.

President BRANDES: I don't believe we have any official standing as an Executive Committee, and I am just wondering if that shouldn't be "subject to the approval of the Council," because we have no Executive Committee.

Dr. NACHTWEY: Mr. President, might I ask, have we a resolution that permits the Council to act in place of the House of Delegates?

Dr. WRIGHT: I don't think we should commit the Society to any program.

Dr. NACHTWEY: The Medical Society I represent did not bring a resolution in on this point. They left it up to their delegate with the understanding it was to be taken up in the House of Delegates, and as a delegate I must bring back a report from the House of Delegates, not from the Council.

President BRANDES: I think that is quite well taken. Of course, it is true that the delegates elect the Council, and in that way you are represented on the Council, although the Constitution and By-Laws don't say much about that. My only point in bringing that up is that this Committee has some work to do that needs the approval of somebody who can speak for the Association.

Dr. NACHTWEY: That was the point sometime ago in delegating the authority to this Executive Committee from the House of Delegates.

President BRANDES: But I find the Executive Committee has no official standing. The reason I said Council is that they can be called into a special session without much expense, while it is rather difficult to call the House of Delegates together and means more expense.

Dr. WRIGHT: Suppose we change this and make it this way, "subject to the approval of whatever group is delegated by this House of Delegates."

Dr. LIEBELER: There is no necessity for that. I think all that is necessary is for this House of Delegates to give the Committee authority to act. I think the latter part of your second recommendation is unnecessary.

Dr. WRIGHT: That will be entirely satisfactory to us, if they want to delegate that to us.

President BRANDES: Are you clear on this recommendation, that the Committee on Medical Economics asks for authority to proceed with further agreements with the F.S.A., for either a state-wide or local program as the Committee may deem advisable.

Dr. NACHTWEY: The Medical Economics Committee make their own decisions. They are in effect the Executive Committee as far as Medical Economics is concerned.

Dr. WRIGHT: We were not asking for all that authority, but if the House of Delegates wants to give us that authority, it will be all right.

Dr. LIEBELER: As I see it, the Council can be called at any emergency at any time between the sessions of the House of Delegates as an advisory body. I don't feel we are giving this Committee too much authority. They have worked hard on it. I happen to know the work that has been put on it. The

Committee is sincere about it. If a matter of controversy comes up, that is, a matter of whether it is going to effect the Society as a whole or not, the Chairman may call at the President's discretion, a meeting of the Councillors. That is all included in our By-Laws.

President Brandes: Our Constitution and By-Laws don't provide for that.

Dr. Liebeler: The new Constitution will, and I again recommend the adoption of the report.

Dr. Cameron: I feel that would be too big an order to delegate to any committee; too serious a proposition. We want to know what that committee is committing us to before we agree to that. We don't even know who the personnel on that committee will be, and why delegate such a serious proposition to that committee.

President Brandes: I know the members of the Economics Committee do not want to take the responsibility. I shall be glad to put this motion as to whether or not you want to delegate authority to the Economics Committee.

Dr. Wright: That is exactly what the Committee doesn't want, was to have that authority.

Dr. Burton: Can't that be deferred until after we adopt our new Constitution?

Dr. Nachtwey: The Medical Association was operating under the idea we had an Executive Committee. At any rate, we functioned last July or sometime along in there, and I believe as a committee of five, took it upon ourselves to decide this and we decided against dealing with the F.S.A. Somebody has to make this decision and if the House of Delegates are satisfied, and I am for one, with this Committee, I feel it is all right; they will have the authority the Executive Committee formerly had.

President Brandes: Will the new Constitution provide that?

Dr. Burton: I move this matter be deferred until after we adopt our new Constitution.

Dr. Liebeler: I second that motion.

The motion prevailed.

Dr. Liebeler: The report of the Committee on Maternal and Child Welfare as submitted by Dr. John H. Moore, chairman, was received and recommended for adoption. Your committee further joins in the recognition of this committee's excellent work which has greatly aided in lowering of the maternal mortality rate, and further urges continuation of the committee and its excellent work in connection with the refresher and graduate courses. I submit this portion of our report, and move its adoption.

Dr. MacLachlan: I second the motion.

The motion prevailed.

Dr. Liebeler: The report of the Committee on Crippled Children submitted by Dr. A. R. Sorenson, chairman, as read by Dr. Skelsey, is recommended for adoption, and I so move.

Dr. Nachtwey: Second.

The motion prevailed.

Dr. Liebeler: The report of the Committee on Radio submitted by Dr. A. C. Fortney, chairman, is recommended for adoption, and I move its adoption.

President Brandes: I think Dr. Fortney should read that report again. (Dr. Fortney read the same.) This report was presented at a special meeting of the Councillors in January at Fargo, and approved by them. It was submitted to the House of Delegates this morning, and referred to the Reference Committee, and it now comes out of the Reference Committee with their approval. Is there a second to that motion?

Dr. Nachtwey: I second the motion.

The motion prevailed.

Dr. Liebeler: The report of the Committee on Venereal Disease as presented by Dr. F. I. Darrow, chairman, is recommended for adoption. I submit this portion of our report and move its adoption.

Dr. Waldschmidt: Second.

President Brandes: I think the recommendation was to carry on the program as outlined; a continuation of the same program.

The motion prevailed.

Dr. Liebeler: The report of the Committee on the Control of Pneumonia as presented by Dr. L. W. Larson, chairman, is highly commended, and that special attention be called to the lower incidence of death since this control program has gone into effect. Your Reference Committee recommends the adoption of the report, and I so move its adoption.

Dr. Fortney: I second the motion.

The motion prevailed.

Dr. Liebeler: The report of the Scientific Committee as presented by Dr. A. D. McCannel, chairman, is printed in the regular program and its adoption is recommended, and I move its adoption.

Delegate: Second.

The motion prevailed.

Dr. Liebeler: The report of the Chairman of the Board of Councillors as submitted by Dr. N. O. Ramstad, is recommended for adoption. I move its adoption.

Delegate: Second.

The motion prevailed.

Dr. Liebeler: The special resolution as submitted by the Kotana Medical Society was read and discussed. Your Reference Committee believes that this problem is fully covered by the recommendations as submitted by the Committee on Medical Economics.

President Brandes: Action has been deferred on that.

Dr. Liebeler: Yes. This report is respectfully submitted.

W. A. Liebeler, M.D., Chairman.
R. H. Waldschmidt, M.D.
B. Hughes, M.D.
F. L. Wicks, M.D.
W. A. Wright, M.D.

President Brandes: We are deeply indebted to this Committee in getting out their excellent report, and I feel the Committee has given proper consideration to all reports coming before it from the various committees. Thank you very much, Dr. Liebeler, and the other members of the Committee.

I think at this time we shall take up the report of the Special Committee on the Revision of the Constitution and By-Laws. Dr. Williamson, are you ready to bring in your report?

Dr. Williamson: This Committee met this afternoon and we had no one appearing before us. If you will turn to page 1, there is nothing to change on page 1. Then you come to Article V, on page 2. We had some talk about that and the Committee was divided; two wanted it left as it is, and two wanted it changed.

President Brandes: What we will do now is to consider Article V of the Constitution and discuss that, and decide just what the wish of this body is regarding Article V.

Dr. Williamson: I like the first one best. We have been operating under that for quite a while and getting along all right. We are just a small Society. When all the Delegates are present, we have only nineteen delegates. The chief objection is that the past presidents should have no right to vote.

Dr. Woutat: We feel certain changes should be made. We feel the House of Delegates should have a vote on the floor. The House of Delegates changes from year to year and should be the representative body of the organization. If we allow the Councillors to vote, the Councillors should be elected by the Districts which they represent.

Dr. MacLachlan: I think they should have the privilege of the floor and should be heard on points of discussion, but I think that the determining course of the House of Delegates should be after that advice and without their vote; that the House of Delegates should be the governing body of this Association.

Dr. Cameron: We want a representative type of body, and the only way we will have one is to have one elected by the members of this Association. We don't want to engage in any discussion here, but it is a fact there has been a lot of dissatisfaction in times past with the set-up we have been operating under, and whether it is right or wrong, there has been a feeling there has not been a representative form of government here in this State Medical Society, but that the organization has for most part, for one reason or another, been in the hands of a few individuals, and there has been a feeling there is not much reason to go to a meeting as a delegate because the delegate don't have very much to say. That is a feeling voiced outside these halls. This is my first time as a delegate but certainly we should all subscribe to any set-up which will give

us a truly representative form of government in our State organization. Now, we don't ask our former Senators or Representatives in Congress or even the Presidents of the United States to vote on certain legislation. They can give us the benefit of all their experience, and certainly any reasonable person will listen to men of experience, but it is not a representative form of government which will give those individuals a right to vote forever.

Dr. RAMSTAD: You might be interested in what took place at our meeting last January. We are responsible for these changes and I would like to explain to you why some of these changes were proposed. We felt first of all in Article V, that the situation should be very clear and we put in this sentence: "The House of Delegates shall be the governing body of the Association," so there will be absolutely no question as to who has the control of the North Dakota State Medical Association. We thought it would be advisable not to have the past presidents and other officers vote. We felt the voting should be restricted to those who were duly elected by the various societies. That doesn't prevent these men from being present, and they have the privilege of the floor. They can advise and give you the benefit of their past experience, but the responsibility should be placed entirely with the House of Delegates.

Then we also feel it would be well to have someone in charge when the House of Delegates is not in session. That body should not be too large and we felt that the Council coming from every part of the State would be possibly the most representative and experienced body you can find, and we put in here that "The Council shall be the Executive Body of the Association and shall consist of ten councillors elected by the House of Delegates," and further "The Council shall have full authority and power of the House of Delegates between the annual sessions unless the House of Delegates shall be called into a special session as provided for in the By-Laws."

Dr. STACKHOUSE: I think any President has a right to vote in any organization. We usually have only a small percentage of delegates here, and they might end up with a tie vote.

President BRANDES: The proposed Constitution provides for a Speaker of the House and he has a vote. I am ready to entertain a motion on Article V, which reads as follows: "The House of Delegates shall be the governing body of the Association and shall consist of the Delegates of the Component Societies that elect them. It shall conduct all business of the Association, except such as is otherwise provided for by the Constitution and By-Laws. The following shall have the privileges of the floor but without the right to vote: The president of the association, the president-elect, the councillors, the secretary, the treasurer, the past presidents, and the delegates to the American Medical Association. All recommendations of the House of Delegates dealing with the acquisition or disposal of property of any kind, or with the appropriation of expenditures of funds in any way, must be approved by the Council. A majority of the registered delegates shall constitute a quorum for the transaction of business."

Dr. WALDSCHMIDT: I move the adoption of Article V of the Constitution.

Dr. MACLACHLAN: I second the motion.

Dr. WICKS: I am just wondering if we couldn't use the word "Voting Body" instead of "governing body," unless these past presidents are designated as members of the House of Delegates, you might find most of them will stay away. I believe we would like to have all these men, although they have no vote, present at our meeting.

President BRANDES: Isn't that covered by the following sentence: "The following shall have the privileges of the floor, but without the right to vote: The president of the association, the president-elect, the councillors, the secretary, the treasurer, the *past presidents*, and the delegates to the American Medical Association."

Delegate: Question.

Dr. Stackhouse: Would you call the roll?

(Upon roll call, the vote was unanimous.)

President BRANDES: The vote being unanimous, the motion is carried.

Dr. WILLIAMSON: Article VI, Section 1, page 2 of the Constitution shall read as follows: "The Council shall be the Executive Body of the Association and shall consist of not more than ten councillors elected by the House of Delegates. The President and the Secretary of the State Association shall be ex-officio members of the Council. Besides its duties mentioned in the By-Laws it shall have charge and control of all the property of this Association of whatsoever nature and of all the funds from whatever source. The Council shall have full authority and power of the House of Delegates between the annual sessions unless the House of Delegates shall be called into a special session as provided for in the By-Laws."

Dr. WOUTAT: I move the adoption of Section 1, Article VI, of the Constitution.

Dr. MACLACHLAN: Second.

The motion prevailed.

Dr. WILLIAMSON: No change on page 3. Article IX, Section 3, page 4, reads as follows: "The Speaker of the House of Delegates shall be elected by the House of Delegates at its second session each year. He may, but need not be, elected from among the members of the House of Delegates."

Dr. MACLACHLAN: I move that Section 3, Article IX, be adopted.

Dr. LIEBELER: I second the motion.

The motion prevailed.

Dr. WILLIAMSON: Articles X, XI and XII are the same as the old Constitution. Article XIII reads as follows: "The House of Delegates may amend any article of this constitution by a two-thirds vote of the delegates registered at the annual session, provided that such amendment shall have been presented in open meeting at the previous annual session, and has been published in the official journal of the association, and that it shall have been sent officially to each component society three months before the session at which final action has to be taken."

President BRANDES: That is the same as in the old Constitution, except instead of *six* months, you substitute *three* months. Are you ready to act on this Amendment?

Dr. MACLACHLAN: The old constitution reads *two* months and this one reads *three* months.

Dr. Ramstad: There is one additional clause in there "and has been published in the official journal of the association."

Dr. LIEBELER: I move the adoption of Article XIII.

Dr. WALDSCHMIDT: Second.

The motion prevailed.

Dr. WILLIAMSON: Chapter I, Section 1, of the By-Laws, reads as follows: "All members of the component societies in good standing shall be privileged to attend all meetings and take part in all of the proceedings of the annual sessions, and shall be eligible to any office within the gift of the Association."

President BRANDES: All you have added there is "in good standing." If there is no objection, that will stand.

Dr. WILLIAMSON: No further changes on page 5, Chapter I of the By-Laws. Now, on page 6 of the By-Laws, Chapter II, Section 3, shall read as follows: "The fiscal year of this Association shall be from April first to April first of each year."

President BRANDES: Any objection to changing that? If not, we will go ahead.

Dr. WILLIAMSON: On page 8, Chapter VI, Section 2. "The President-elect or one of the Vice-Presidents, when called upon, shall assist the President in the performance of his duties, and during his absence, or at the request of the President, one of them shall officiate in his place. In case of the death, resignation, or removal of the President, the vacancy shall be filled by the First Vice-President, and in case of his death, resignation, or removal, by the Second Vice-President."

President BRANDES: If there are no objections to this change, we will go ahead.

Dr. WILLIAMSON: Page 9, Section 4. There is one change in this section. "He shall employ such assistants as may be ordered by the Council." Page 11, Chapter VIII. "No expenses shall be incurred by any committee or committeemen without first having received proper authority from the Council."

Delegate: I move the adoption of Chapter VIII of the By-Laws.

Dr. MACLACHLAN: I second the motion.

The motion prevailed.

Dr. MACDONALD: I move that the Committee on Medical History and the Committee on Necrology be combined.

Dr. Burton: I second the motion.

The motion prevailed.

Dr. MacLachlan: What about the Committee on Crippled Children and the Committee on Maternal and Child Welfare?

President Brandes: I don't think that would work as they are two different departments. If there is no objection we will strike out the "Committee on Constitution and By-Laws."

Dr. Williamson: Page 11, Chapter VIII. "New committees may be formed and filled in case of emergency by the president."

President Brandes: Is that provided for in the old By-Laws? Let us have a motion on that. In these days we find it necessary to appoint new committees on short notice. This year it was necessary to appoint a "Committee on Pneumonia Control."

Dr. Waldschmidt: I move the adoption of Chapter VIII of the By-Laws.

Dr. Wicks: I second the motion.

The motion prevailed.

Dr. Williamson: Section 1 on page 12 of the By-Laws is omitted. Page 14, Section 1, Chapter IX. "The assessment of $10.00 per capita on the membership of the component societies unless otherwise ordered by the House of Delegates is hereby made the annual dues for this association. The Secretary of each district society shall forward its assessment together with its roster of all officers and members, list of delegates, and list of non-affiliated physicians of the district to the secretary of this society not later than the first day of March in each year."

Dr. Ramstad: We thought it would be advisable to have absolute control of this matter in the hands of the House of Delegates so if they found they could lower the assessment, it would be very nice, and if they had to elevate it everybody would have to take it, and we thought it a good thing to have it arranged that way.

President Brandes: Is there any further discussion? If not, I will entertain a motion on Chapter IX, Section 1.

Dr. Miller: I move the adoption of Section 1, Chapter IX, of the By-Laws.

Dr. MacLachlan: I second the motion.

The motion prevailed.

Dr. Williamson: Now turn to page 15, Section 8. "A physician may hold his membership in that local society most convenient for him to attend, provided no objection is made by the society in whose jurisdiction he resides."

President Brandes: If there is no objection to crossing out the words "living near a county line," it will stand.

Dr. Williamson: Page 17, Order of Business, Number 13 should be Nominating Committee, and Number 14 should be Adjournment.

President Brandes: What about the appointment of a Reference Committee?

Dr. Williamson: That could come under Appointment of Special Committees.

Dr. Waldschmidt: On page 16, Chapter XIII. What do you mean by laying amendments upon the table for one day?

President Brandes: Let's decide on that because it makes some difference.

Dr. MacLachlan: An amendment should come out at least one day.

President Brandes: The only trouble about that is we only meet one day and want to close up all our business on the same day.

Dr. Williamson: I move that Chapter XIII of the By-Laws read "These By-Laws may be amended at any annual session by a majority vote of all the delegates present at that session, after the proposed amendments have laid upon the table for one session, provided that any such amendment be introduced in writing at the first session and acted upon at the last session."

Dr. MacLachlan: I second the motion.

The motion prevailed.

President Brandes: Now we will vote on this as a whole.

Dr. Williamson: I move, Mr. President, that this Constitution and By-Laws as passed upon at this Session be adopted to become effective at this session.

Dr. Stackhouse: Second.

President Brandes: All in favor signify by saying Aye".

All: "Aye".

President Brandes: Opposed. (No response.) Carried. Now, let us go back to the Recommendations of the Economics Committee.

Dr. Wright: We recommend that Recommendation No. 2 of the Economics Committee be changed to read "We would ask that your Committee receive authority from the House of Delegates to enter into an agreement with the F.S.A. for either a state-wide or local program as the Committee may deem advisable, subject to the approval of the Council."

President Brandes: You have heard the recommendation from the Medical Economics Committee, what is your wish in the matter?

Dr. Nachtwey: I move its adoption.

Dr. Macdonald: I second the motion.

President Brandes: Any discussion before we put the motion? That will be a part of the Reference Committee's report.

Delegate: Question.

The motion prevailed.

Dr. Liebeler: I move the report of the Reference Committee as a whole be adopted at this time.

Dr. MacLachlan: I second the motion.

The motion prevailed.

President Brandes: Dr. Ramstad, are you ready to report for the Committee on Reorganization of the Secretary's Office?

Dr. Ramstad: Your committee recommends the appointment of a full-time secretary.

Second, in order to do this, it will be necessary that the dues be increased to twenty dollars per annum.

(Signed) A. P. Nachtwey, M.D.
G. B. Ribble, M.D.
A. W. MacDonald, M.D.
P. H. Burton, M.D.
N. O. Ramstad, M.D.

Dr. Nachtwey: I move the adoption of the report of Dr. Ramstad.

Dr. Liebeler: I second the motion.

President Brandes: I think before I put this motion we should have some discussion. I know there are some things to be said in favor of a full-time secretary, and I know too we are not a very large society and the question is whether we can work this out to the satisfaction of all members. If this motion prevails and this report is adopted, it will mean another year's delay in carrying out the work as it should be carried out in the Secretary's office. As you know, we don't put much money in the Secretary's office and we can not expect the secretary to do a great deal, and there is a lot more work to be done than we have been doing.

Dr. MacLachlan: I think at this time the adoption of the motion would be a very serious blow to the State Medical Association in these times. I know the sentiment is we have gotten along very well for many years with a part-time Secretary, and while the business of our organization probably would require a full-time secretary, I still think at this time when we have within the past year or two advanced the fees in the State Association, to put on an additional ten dollars on top of that in these times, you are going to take a serious chance of losing a large percentage of the members of this Association. I think I speak the sentiments of those in our part of the country. I think this is something to seriously consider and not go too far. Our membership has decreased but we carry on the best we can, and in order to do that we should have the coöperation of all of the qualified members of the state, if we can carry them with us, and I think we should carry them with us at a price not to exceed the one we have at this time. I think this is something we should consider very seriously and not go too far.

Dr. Hughes: You may have noticed in the report of the Second District, one man withdrew from the Society on account of increased dues. At that time there was a great deal of discussion about the dues and about what the men were getting for their money, and I feel there will be further withdrawals if this schedule is put into effect.

President Brandes: I agree with the men who have just spoken on this subject. You must give this some serious consideration.

Dr. Liebeler: I speak for the Grand Forks Medical Society. We were given the information that the dues could be

raised up to another $10.00 at this session, and we did have opposition to the proposition and the mention was made by a goodly number of withdrawing. However, after they were informed as to what this money would be expended for, they changed their minds. We need a full-time secretary and I think we should act now.

Dr. NACHTWEY: I was a member of this Committee which had this under consideration and we heard all of these arguments. A year ago when we raised the dues to $10.00 we made a mistake then because the Committee was under the delusion that with $10.00, that increase of $5.00, we could take care of a full-time secretary. I know when it was brought up and explained what the money was for, there was no question about it and no member dissented to raising the dues. Now we are asking one doctor to devote part of his time as a Secretary and part time as a doctor, and your committee felt justice could not be done to it. I don't know whether the members of the House of Delegates know that this job of a full-time medical secretary is now a profession that has been taken up by a group of men devoting their time to just this work.

Dr. FORTNEY: The delegation of Cass County have received specific instructions regarding this proposal, and it states the Cass County Medical Association is opposed at this time to having a full-time secretary of the North Dakota State Medical Association, one reason being no one has demonstrated to them just how much work a full-time secretary will have.

President BRANDES: There is a motion before the House. Is there any further discussion? This is an important matter and I want to give everyone an opportunity to discuss this before I put the motion.

Dr. CAMERON: Personally I am in favor of a full-time secretary but I am sure that would be a questionable matter as far as the Society I represent is concerned. I am sure that they need enlightenment before they would be in favor of it.

Dr. WRIGHT: I believe it would be rather difficult to induce the members of Kotana District to pay this additional $10.00. It has been pointed out here that there is a lot of work being done by the different committees, and by the chairmen of the committees at their own expense and time, and a good deal of this work should be done by a full-time secretary. I approve of a full-time secretary and think it would be a very fine thing for the society, but I am doubtful as to how my own members would react to it.

Dr. LIEBELER: I believe if the delegates go home and give this information to their component societies, they will be willing to give this amount. I do know several committees appointed here year after year have spent a lot of their own time and money on matters that should have been taken care of by a full-time secretary. I think it is asking too much of the chairmen of these different committees to do the work they do.

Dr. HUGHES: Would it be possible to take this matter back to our component societies and discuss it and have their impression of this matter and then empower the councillors to act upon it at a future meeting, and in that way we will be able to get the ideas of the society as a whole, and I think this matter is sufficiently big to have their approval or disapproval.

President BRANDES: You understand, Dr. Hughes, if this motion goes through there is nothing you can do this year. You cannot go back and ask them for $10.00 more this year. What you are going to do is to carry the information back with you that the dues will be $20.00 starting with next year.

Dr. HUGHES: I make the motion that this matter be referred to the local societies.

President BRANDES: There is a motion before the House at this time. Dr Skelsey, read the motion again, please.

(Dr. Skelsey read the motion made by Dr. Nachtwey moving the adoption of the report of Dr. Ramstad, chairman of the Committee on Reorganization of the Secretary's Office.)

Dr. MACLACHLAN: I move a substitute motion that this motion be referred back to the local societies for their action upon it, and that this matter of a full-time secretary and raising of the dues be decided by the local societies.

The substitute motion lost for want of a second.

Dr WOOD: May I ask a question? I would like to ask the secretary what the membership is this year, compared to last year?

Secretary SKELSEY: Last year 403, and now up to Saturday 348.

Dr. Wood: Personally I would be in favor of paying $20.00, but I believe you would have a hard time in getting some of the men from the outlying districts that are lukewarm society members that come to the local meetings and seldom come to the state meetings, you would have a hard time getting them to pay $20.00, and I firmly believe you would have a considerable further drop in the membership. I believe in our own society we would lose three or four members.

President BRANDES: Are you ready for the question on the original motion, which provides for a full-time secretary and raising of dues to $20.00?

Delegate: Question.

President BRANDES: Dr. Skelsey will you please call the roll?

Secretary Skelsey called the roll, and the vote resulted in ten in favor of the motion, and six against the motion, and the President declared the motion carried.

President BRANDES: We have two more committees to hear from, and I will now call on Dr. Fortney for a report of the Nominating Committee.

Report of the Nominating Committee

Dr. Fortney presented the report of the Nominating Committee as follows:

President: Dr. C. J. Glaspel, Grafton.
President-Elect: Dr. F. W. Fergusson, Kulm.
First Vice-President: Dr. A. R. Sorenson, Minot.
Second Vice-President: Dr. F. I. Darrow, Fargo.
Secretary: Dr. L. W. Larson, Bismarck.
Treasurer: Dr. W. W. Wood, Jamestown.
Delegate to the A. M. A., 1941:
Dr. A. P. Nachtwey, Dickinson.
Alternate Delegate: Dr. C. E. Stackhouse, Bismarck.
Councillors:
Second District: Dr. W. C. Fawcett, Starkweather.
Seventh District: Dr. P. G. Arzt, Jamestown.
Eighth District: Dr. G. B. Ribble, LaMoure.
Tenth District: Dr. A. E. Spear, Dickinson.
Recommended as members of the North Dakota State Board of Medical Examiners:
Dr. W. A. Gerrish, Jamestown.
Dr. A. D. McCannel, Minot.
Dr. W. A. Wright, Williston.

President BRANDES: You have heard the report of the Nominating Committee, are there any nominations to come from the floor?

Dr. WILLIAMSON: I move the report of the Nominating Committee be adopted.

Dr. MACLACHLAN: Second.

The motion prevailed.

Dr. WILLIAMSON: I will withdraw that motion for I am not a Delegate.

Dr. MACLACHLAN: I take back the second, too.

Dr. WALDSCHMIDT: I move the report of the Nominating Committee stand as read.

Dr. LIEBELER: I second the motion.

The motion prevailed.

Dr. FORTNEY: Are we acting under the new Constitution now?

President BRANDES: Yes, we are.

Dr. FORTNEY: Don't we have another person to nominate?

President BRANDES: Yes, we should elect a Speaker of the House.

Dr. BURTON: I would like to nominate Dr. John Moore.

Delegate: Second.

Dr. NACHTWEY: I nominate Dr. Spear.

Delegate: Second.

Dr. LIEBELER: I move that the nominations be closed.

Delegate: Second.

The motion prevailed.

Voting was by ballot and resulted as follows:

Dr. John H. Moore, Grand Forks, 12 votes.
Dr. A. E. Spear, Dickinson, 3 votes.

President BRANDES: Dr. Moore is declared Speaker of the House. We will hear from the Committee on Resolutions, Dr. MacLachlan.

Report of Committee on Resolutions

Dr. McLachlan presented the report of the Committee on Resolutions:

Resolved that organized Medicine in North Dakota as represented by this Association in annual convention assembled, reaffirm its determination to unitedly and devotedly employ its every reasonable human and scientific effort toward the eventual dissolution of man's greatest enemy in this state, disease of humankind, and its relief.

Resolved too that in the furtherance of this cause we anticipate the coöperation of our state's citizenry, our state Legislature and Congressional delegation, our Public Health Bureau at Washington, and our own locally, as well as that of our Executive Head at Washington, to sustain us in this our humane objective.

We deplore "man's inhumanity to man" as exhibited in war's desolation of home and country abroad, and the mutilation of the Creator's image as emblemized in man, and earnestly pray that we may be spared its implications and devastations.

We advocate the application of the tenets of The Golden Rule as between our professional conferees in local societies, that justice to our contemporaries and harmony in our humane undertakings may uniformly prevail to the benefit of our patients.

We commend the course of the American Medical Association in its efforts to maintain liberty of action in the individual's choice of his medical counsellor, and deplore the evident intention of a group of political strategists who would nationally undermine the medical structure of this country and raze its humane foundations in principle.

Be it Further Resolved, that in the scientific program provided for our consideration and digestion, and in the attractiveness of its social features, the Northwestern Medical Society in its hub, The Magic City of Minot, has sustained the reputation acquired in pioneer days of being second to none, within our borders, and for their invitation and successful performance, are due in return our thanks and courteous appreciation in which the City and its service organizations we hope will mutually partake. We hope and trust that in due time our Association will again be awarded to partake of Minot hospitality.

O. T. Benson, M.D.
Chas. MacLachlan, M.D., Chairman

Dr. MacLachlan: I move the adoption of the report.

Dr. Wicks: I second the motion.

The motion prevailed.

President Brandes: I think we should have a motion recommending the printing of the new Constitution and By-Laws by the Council.

Dr. Woutat: I move that the Council be instructed to have our new Constitution and By-Laws printed.

Delegate: Second.

The motion prevailed.

Dr. Ramstad: Something has arisen that requires the Council to call a special meeting, and some of the members of the Council have requested that we have a special meeting at eleven o'clock tomorrow morning. We will have to absent ourselves from the scientific program but that is the best we can do.

President Brandes: I want to thank you very much for the assistance you have given me in carrying out the business of our State Association. You have been here all day and you have worked hard, and I want you to know I appreciate it. I think you have done an excellent job.

Motion to adjourn made, seconded and carried.

(The third meeting of the House of Delegates, May 6, 1940, terminated at 11:00 P. M.)

SPECIAL SESSION
of the
HOUSE OF DELEGATES
May 7, 1940

A special session of the House of Delegates was called by the President, Dr. H. A. Brandes, at 5:15 P. M., Tuesday, May 7, 1940, in the Masonic Temple, Minot, North Dakota.

President Brandes: As a number of the Delegates have left for home, I will appoint Dr. J. O. Arnson to take the place of Dr. Waldschmidt of the Sixth District; Dr. W. H. Bodenstab for Dr. C. C. Smith of the Sixth District; Dr. W. H. Long for Dr. A. C. Fortney of the Cass County District, and Dr. Bertha B. Brainard for Dr. Simon Melzer of the Stutsman County District.

Secretary Skelsey called the roll, and the following delegates were present:

Doctors:

W. H. Long
P. H. Burton
H. W. Miller
W. A. Wright
W. A. Liebeler
P. H. Woutat
H. O. Grangaard
J. O. Arnson
W. H. Bodenstab
G. B. Ribble
O. T. Benson
A. P. Nachtwey
Bertha B. Brainard
A. A. Kjelland
H. Van de Erve

The President declared a quorum present and the House duly constituted for the transaction of business.

President Brandes: This meeting was called at the request of the Council. They submitted a resolution to me at noon today, asking that I call a special meeting of the House of Delegates, to reconsider the action taken by you last night when you raised the dues to $20.00 per annum. They ask that you reconsider this action because they think it is an important matter and feel that final action should be taken by the membership through the component societies. I am not speaking for it or against it. You represent your membership and it is up to you to decide. The new Constitution and By-Laws provide that you can refer this to your component societies and let them decide as to whether or not they want the dues raised, and want to employ a full-time secretary. Personally, I feel you can't do anything now as far as a full-time secretary is concerned, for you haven't the money and the money won't come in until next year. If you refer this back to the component societies and they decide to raise the dues to $20.00 a year and employ a full-time secretary, there will not be the criticism of this body that there will be if you sustain the action you took last night.

Dr. Nachtwey: In order to facilitate this thing and not keep us here too long, I want to make a motion. I move "that the action of the House of Delegates taken yesterday in raising the dues to $20.00 be referred to the members of the Association for approval or rejection, and that the membership act upon said matter before December 1st." Then, if it is necessary to have a special meeting of the House of Delegates to confirm the action of the component societies, we can have such meeting before our next annual meeting.

Dr. Liebeler: Second.

President Brandes: All in favor of the motion just made and seconded, signify by saying "Aye".

"Aye": Fourteen delegates answered "Aye".

President Brandes: Opposed: One delegate answered "No". The motion is carried.

Upon motion the meeting adjourned.

SCIENTIFIC PROGRAM
May 7, 1940
Morning Session

8:30—Registration
9:00—Address of Welcome—Mayor Sandberg.
9:15—Address of President—Dr. Harry Brandes.
9:30—Symposium:
"Essential Hypertension"
9:30—From the Standpoint of Otolaryngology.
Dr. Walter Camp, clinical assistant professor of ophthalmology and otolaryngology, University of Minnesota Medical School.
10:00—From the Standpoint of Ophthalmology.
Dr. Thomas Allen, assistant professor of ophthalmology, Rush Medical School, Chicago, Illinois.
10:30—Exhibits.

10:45—From the Standpoint of the Internist, Problems of Essential Hypertension—Dr. Charles N. Hensel, St. Paul, Minnesota.

Afternoon Session

2:00—"Hernia"—Dr. R. C. Webb, assistant professor of surgery, University of Minnesota Medical School.
2:30—"The Eczemas"—Dr. Paul A. O'Leary, professor of dermatology, University of Minnesota Medical School.
3:00—Economics—The Work of the National Physicians Committee—John M. Pratt, executive director, Chicago, Illinois.
3:30—Exhibits.
3:45—"Convulsive Disorders in Children"—Dr. Chester A. Stewart, clinical professor of pediatrics, University of Minnesota Medical School.
4:30—"Simple Mastectomy vs. Radical Mastectomy in Carcinoma"—Dr. C. W. Schoregge, Bismarck, North Dakota.
Demonstration of First Aid in Case of Fractures—Fracture Committee of American College of Surgeons. (Exhibition Hall.)

May 8, 1940—Morning Session

9:30—"Vascular Disease as Related to the Pregnancy Toxemias"—Dr. John L. McKelvey, professor of obstetrics, University of Minnesota Medical School.
10:00—"Chronic Infections of External Genitalia"—Dr. Monte C. Piper, Mayo Clinic, Rochester.
10:30—Exhibits.
10:45—"The Choice of Operation for Bladder Neck Obstructions"—Dr. F. E. Foley, assistant professor of urology, University of Minnesota Medical School.

Afternoon Session

2:00—"Role of the Private Practitioner in Detecting Pulmonary Tuberculosis"—Dr. Cedric Northrup, superintendent, North Dakota State Tuberculosis Sanatorium.
2:55—"Thyroid Disease"—Dr. Gordon Fahrni, associate professor of surgery, University of Manitoba Medical School, Winnipeg.
3:30—"Early Skull Fractures"—Dr. A. W. Adson, professor of neurological surgery, Mayo Foundation, Rochester, Minnesota.

During the morning session on May 8, 1940, President Brandes announced that a Committee on Resolutions, consisting of Dr. Darrow, Dr. Moore and Dr. Schoregge, was ready to report, and called upon Dr. Darrow to present the report.

Resolution

Dr. Darrow presented the following Resolution:

WHEREAS, Doctor A. W. Skelsey has served a long series of terms as the Secretary of the North Dakota State Medical Association, and

WHEREAS, Doctor Skelsey's service has not only been long but unusually faithful and his devotion to his task has at all times carried a deep understanding of the fundamental principles of medical ethics which has in no small measure resulted in a series of harmonious administrations,

NOW BE IT RESOLVED: That the North Dakota Medical Association tender this vote of thanks to Doctor A. W. Skelsey for his long and faithful service and that a record of this Resolution be spread upon the minutes of the meeting.

F. I. DARROW, M.D.
P. H. BURTON, M.D.
C. W. SCHOREGGE, M.D.

Dr. DARROW: I move the adoption of this Resolution.

Dr. HUNTLEY: I second the motion.

President BRANDES: All in favor signify by standing, please. All stood and applauded.

President BRANDES: The motion is unanimously carried.

Dr. SKELSEY: I wish to express my appreciation of the past ten years work and the relationship with the members. I say relationship because I am old-fashioned and don't like the word "contact". My relationship with the members has been very fine, and I desire to ask that you kindly continue this support to Dr. Larson. Thank you.

At the afternoon session of the Scientific Program on Wednesday, May 8, 1940, President Brandes announced that the Constitution provided that the incoming President be installed at two o'clock P. M., on the last day of the Scientific Program, and asked Dr. Burton of Fargo and Dr. Stackhouse of Bismarck, two past-presidents, to escort Dr. Glaspel, the new President, to the chair.

President BRANDES: Members of the North Dakota Medical Association: It is not necessary for me to say anything to you about our incoming President, Dr. C. J. Glaspel of Grafton. You all know the high regard we have for him and the high place he holds in our profession in our State. He served with the A.E.F. in the World War, No. 1, and for many years he has been a medical officer in the 164th Infantry of the North Dakota National Guard. For the past four years he has been Major and Commanding Officer of the Medical Detachment of that organization. Now, to you men who are going to serve as chairmen and members of the standing committees, I mention this military background because he is accustomed to giving orders and he expects them to be carried out, and you won't be able to come back with any excuses. I know you will have an excellent administration under Dr. Glaspel, and I ask for him the splendid spirit of coöperation you have given me during the past year. Dr. Glaspel, it is my happy privilege to pass over to you the gavel of this office, and with it all my good wishes for a successful administration.

Dr. GLASPEL: Gentlemen: I deeply appreciate the honor you have conferred upon me, yet somewhere in my make-up there is the apprehension that possibly I may not present all of the high qualities of leadership which you have been accustomed to see in this office. This much I know, that I am fully conscious of the many responsibilities of my task. No one could sit in the proceedings and administration of your House of Delegates last Monday and not come away with the realization there is still much work to be done in our organization. We are living in a changing world and during the past few years, particularly, we have seen economic disturbances which either directly or indirectly actually seem to threaten the foundation upon which the practice of medicine is based. It is necessary that we meet those conditions in our state society. There are still problems which have not been solved to the satisfaction of all those concerned. We must continue to put forth a constructive effort towards the solution of those problems. Dr. Brandes has just completed a very constructive tenure of office. He has given freely of his time and of his very best efforts, and he has been able to instill new life and new energy. He has had good judgment in calling upon the Councillors for their help and advice in many matters pertaining to the administration of your organization. In fact, he has so conducted the many tasks and many duties of his office in such a manner that he is going to be a most difficult man to follow. However, at this time, I do solicit the support of every one of you. That means the support and coöperation of each component society and every individual member. Our organization is democratic and we wish it to remain such. It is an organization where every delegate—yes, every member—should feel free to express his opinion on any subject at the proper time and in the proper place. Your officers and your committeemen are the property of you, the membership; they merely represent the means and instruments by which your wishes and mandates are to be carried out. There can be no question about this because last night at a special meeting of the House of Delegates, they voted to refer back to you, certain proposed changes, so that you can study them over carefully and then approve or reject them as you see fit.

It is my hope we may go along this coming year in unison and in harmony. That does not necessarily mean that there will be no criticism and no differences of opinion, but rather that when we approach the end of the year and total up the results of the administration, we can say that something definite has been accomplished and that increased benefits have been gained, not only by the medical profession of this state as a whole, but more so by the public, which you men so conscientiously serve. Thank you very much.

NORTH DAKOTA STATE MEDICAL ASSOCIATION DISTRICT SOCIETY ROSTER--1940

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Parnall, Edward	Minot
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Pence, R. W.	Minot
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Christianson, H. A. ..... Jamestown
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Fawcett, J. C. ..... Devils Lake
Fawcett, N. W. ..... Devils Lake
Fawcett, W. C. ..... Starkweather
Fergusson, F. W. ..... Kulm
Fergusson, V. D. ..... Edgeley
Fischer, V. J. ..... Towner
Fisher, A. M. ..... Jamestown
Fjelde, J. H. ..... Fargo

Flaten, A. N. Edinburg
Flath, M. G. Stanley
Floew, Arnt T. Fargo
Ford, F. W. Devils Lake
Fortin, Harry J. Fargo
Fortney, A. C. Fargo
Foster, George C. Fargo
Fredricks, L. H. Bismarck
Freise, P. W. Bismarck
French, H. E. Grand Forks
Gaebe, O. C. New Salem
Gammell, R. T. Kenmare
Garrison, M. W. Minot
Gerdes, Maude M. 1048 Canal Bank Bldg., New Orleans, La.
Gerrish, W. A. Jamestown
Gillespie, D. R. Bismarck
Gilsdorf, A. R. Dickinson
Gilsdorf, Walter H. New England
Glaspel, C. J. Grafton
*Glaspel, G. W. Grafton
Goehl, R. O. Grand Forks
Goodman, Robert Powers Lake
Goss, Edwin Lincoln Carrington
Graham, J. D. Devils Lake
Grangaard, Henry O. Ryder
*Grassick, James Grand Forks
Greene, E. E. Westhope
Greengard, M. Rolla
Griebenow, Frederick F. Bismarck
Griffin, V. M. Grand Forks
Grinnell, E. L. Grand Forks
Grorud, Alton C. Bismarck
Gumper, A. J. Dickinson
Gumper, J. B. Belfield
Haagensen, E. C. Grand Forks
Hackie, E. A. Valley City
Halliday, A. B. Hebron
Halliday, D. J. Kenmare
Halverson, Henry L. Minot
Hammargren, A. F. Harvey
Hanna, J. F. Fargo
Hanson, Geo. C. Minot
Haraldson, Olaf Minot
Hardy, N. A. Minto
Harris, Charles B. Pembina
Haugen, C. O. Larimore
Haugrud, Earl M. Fargo
Haugen, H. Fargo
Haynes, G. H. Lisbon
Heffron, M. M. Dickinson
Heinzeroth, Geo. E. Turtle Lake
Henderson, R. W. Bismarck
Hendrickson, G. Enderlin
Hetherington, J. E. Grand Forks
Hetzler, A. E. Mandan
Hills, S. W. Regent
Hoeper, P. G. E. 303 E. 20th St., New York City
Hofto, J. M. Grand Forks
Holt, George H. Jamestown
Hoskins, J. H. Wahpeton
Howard, Laura K. Jamestown
Hughes, Bernard J. Rolla
Hunter, G. Wilson Fargo
Huntley, H. B. Kindred
Irvine, V. S. Park River
Ittkin, Paul Mohall
Ivers, G. U. Fargo
Jacobson, M. S. Elgin
James, J. B. Page
Jelstrup, Christian Big Lake, Minn.
Jensen, A. F. Grand Forks
Johns, Stephen M. Jamestown
Johnson, C. A. Larimore
Johnson, C. G. Rugby
Johnson, J. A. Bottineau
Johnson, O. W. Rugby
Johnson, P. O. C. Watford City
Joistad, A. H. Fargo
Jones, Carlos S. Williston
Kaess, A. J. Fargo
Kaufman, M. I. H. Velva
Kempthorne, Charles Manhattan, Kan.
Kermott, Louis H. Minot
Kjelland, Andrew A. Hatton
Knudson, K. O. Glenburn
Knutson, O. A. Buxton
Korwin, J. J. Williston
Kositsky, A. Granville
LaFleur, Harold A. Lakota
LaMont, John G. Grafton
Lampert, M. T. Minot
Lancaster, W. E. G. Fargo
Landry, L. H. Walhalla
LaRose, Victor J. Bismarck
Larson, E. J. Jamestown
Larson, G. A. Fargo
Larson, Leonard W. Bismarck
Laugeson, Lyder L. 4553 El Cajon Ave., San Diego, Calif.
Law, H. W. F. Grand Forks
Leavitt, R. H. Kramer
Lehman, W. L. General Hospital, Minneapolis, Minn.
Leigh, R. E. Grand Forks
Lemieux, Darie Rolla
Lewis, T. H. Fargo
Liebeler, W. A. Grand Forks
Limburg, Albert M. Fargo
Lipp, George R. Bismarck
Little, Ethel E. Minot
Little, R. C. Mayville
Lodmell, L. A. Univ. of N. D.
Lohrbauer, L. T. Grand Forks
Lommen, Clarence E. Fordville
Long, W. H. Fargo
Longstreth, W. E. Kensal
Lynde, Roy Ellendale
Lyons, M. W. Beach
McCannel, Archibald D. Minot
McIntosh, G. J. Devils Lake
McKeague, D. H. Maddock
McQueen, W. W. Langdon
Macdonald, A. C. Valley City
Macdonald, A. W. Valley City
MacDonald, J. A. Cando
MacGregor, Murdock Fargo
*MacLachlan, Chas. New Rockford
Maercklein, O. C. Mott
Mahowald, R. E. Grand Forks
Malvey, Kenneth Bottineau
Matthaei, D. W. Fessenden
Mattson, Roger H. McVille
Mazur, B. A. Fargo
Melzer, S. W. Woodworth
Meredith, C. J. Valley City
Merrett, J. P. Marion
Meunier, H. J. Oakes
Miller, H. H. Wahpeton
Miller, H. W. Casselton
Miller, J. P. (Dec.) Grand Forks
Miller, Samuel Ellendale
Moffat, George Crosby
Monteith, George Hazelton
Moore, John H. Grand Forks
Moore, M. J. New Rockford
Moreland, J. W. Carpio
Morris, Arthur C. Fargo
Moyer, L. B. Carson
Mulligan, V. A. Langdon
Murray, K. M. Scranton
Muus, O. H. Grand Forks
Nachtwey, A. P. Dickinson
Nelson, Woodrow Minot
Nesse, S. A. Nome
Nichols, Arthur A. Fargo
Nichols, Wm. C. Fargo
Nickerson, Bernard S. Mandan
Nierling, R. D. Jamestown
Northrop, C. San Haven
Nuessle, Robert F. Bismarck
O'Brien, L. T. Wahpeton
Odegaard, Bernt Mayville
Oftedal, Axel Fargo
Oftedal, Trygve Fargo
Olafson, K. Cando
Olesky, E. Mott
O'Neill, R. T. Minot
Ostfield, J. R. Fargo
Owens, Clarence G. New Rockford
Owens, P. L. Bismarck
Panek, A. F. Milton
Parnall, Edward Minot
Patterson, Charles H. Fargo
Patterson, Stanley Mandan
*Patterson, T. C. Lisbon
Peake, Francis M. Jamestown
Peake, Margaret F. Grand Forks
Pence, J. R. Minot
Pence, R. W. Minot
Perrin, E. D. Bismarck
Peterson, Donald Fargo
Pierce, W. B. Bismarck
Platou, C. A. Valley City
Pray, R. E. Fargo
Quain, E. P. Bismarck
Quain, Fannie Dunn Bismarck
Quale, V. S. Grand Forks
Quamme, Roy K. Portland
*Quick, Jacques V. Wahpeton
Radl, Robert B. Bismarck
Ramstad, N. O. Bismarck
Rand, C. C. Grafton
Ransom, H. R. Grand Forks
Ransom, E. M. Minot
Reed, Paul Rolla
Reichert, H. L. Dickinson
Reiswig, A. H. Wahpeton
Ribble, G. B. LaMoure
Rice, Paul F. Solen
Richter, E. H. Hunter
Roan, Martin Wm. Bismarck
Robertson, C. W. Jamestown
Rodgers, Robt. W. Dickinson
Rollefson, C. I. Crosby
Rollie, C. O. Drake
Rose, Norman J. Finley
Rosenberger, H. P. Bismarck
Rostel, Hugo Fargo
Roth, J. H. Jamestown
Rothnem, T. P. Fargo
Rowe, P. H. Minot
Ruud, H. O. Grand Forks
Ruud, M. B. Grand Forks
Rystad, Olaf H. Grand Forks
Sand, Olaf Fargo
Sasse, Ernst G. Lidgerwood
Savre, M. T. Northwood
Schatz, George West Fargo
Schoregge, C. W. Bismarck
Schumacher, N. W. Hettinger
Schwinghamer, E. J. New Rockford
Sedlak, Oliver A. Fargo
Seibel, L. J. Harvey
Seiffert, G. S. Minot
Serhus, L. N. Rugby
Sihler, W. F. Devils Lake
Sinner, Bernard L. Fargo
Skarshaug, H. J. Washburn

Skelsey, Albert Wesley ..... Fargo
Skovholt, H. T. ..... Williston
Smith, Cecil C. ..... Mandan
Smith, Clinton ..... Devils Lake
Smith, J. Allen ..... Noonan
Smith, LeRoy G. ..... Mandan
Smith, Oscar M. ..... Killdeer
Sorenson, A. R. ..... Minot
Sorkness, Joseph ..... Jamestown
Spear, A. E. ..... Dickinson
Spielman, George H. ..... Mandan
Stackhouse, C. E. ..... Bismarck
Stafne, Wm. A. ..... Fargo
Stickelberger, J. ..... Oberon
Stolinsky, A. ..... Lisbon
Strauss, F. B. ..... Bismarck
Swanson, J. C. ..... Fargo
Tainter, Rolfe ..... Fargo
Thompson, A. M. ..... Wahpeton
Thompson, Roy C. ..... Wilton
*Timm, John F. ..... Makoti

*Honorary Member

Tompkins, C. R. ..... Grafton
Toomey, G. W. ..... Devils Lake
Tronnes, Nels ..... Fargo
Urenn, B. M. ..... Fargo
Vance, R. W. ..... Grand Forks
Van de Erve, Herbert ..... Carrington
Van Houten, J. ..... Valley City
Verret, B. D. (Deceased) ..... Rolla
Vigeland, J. G. ..... Brinsmade
Vinje, Ralph ..... Beulah
Vinje, Syver ..... Hillsboro
Vonnegut, Felix F. ..... Hague
Wagar, Wm. D. ..... Michigan
Waldren, H. M., Jr. ..... Drayton
Waldren, Henry M., Sr. ..... Drayton
Waldschmidt, R. H. ..... Bismarck
Wall, Willard W. ..... Minot
Watson, E. M. ..... Fargo
Weed, F. E. ..... Park River
Weeks, S. A. ..... Ambrose
Weible, E. B. ..... Abercrombie

Weible, Ralph Emerson ..... Fargo
*Welch, W. F. ..... Larimore
Westervelt, A. E. ..... Bowdon
Westley, Martin D. ..... Cooperstown
Westmoreland, M. G. ..... Grand Forks
Weston, Daniel T. ..... Mandan
Weyrens, Peter J. ..... Hebron
Wheeler, H. A. ..... Mandan
White, Robert G. ..... Valley City
Wicks, F. L. ..... Valley City
*Widmeyer, J. P. ..... Rolla
Williams, Mark F. ..... Linton
Williams, Maysil ..... Bismarck
Williamson, Geo. M. ..... Grand Forks
Winn, W. R. ..... Fargo
Witherstine, W. H. ..... Grand Forks
Wolfe, F. E. ..... Oakes
Wood, Wm. W. ..... Jamestown
Woodward, F. O. ..... Jamestown
Woutat, P. H. ..... Grand Forks
Wright, W. A. ..... Williston
Yeomans, T. N. ..... Minot
Youngs, Nelson A. ..... Grand Forks

Presidential Address*

H. A. Brandes, M.D.
Bismarck, North Dakota

IT has been an interesting experience for me to have served as your president, and I wish at the outset of this short address to express my sincere appreciation for the honor and privilege of serving in the highest office of our state society.

I also wish to take this opportunity to extend my sincere thanks to the officers, councillors, the chairmen and the members of the standing committees for the splendid spirit of coöperation given me during the year. To the men who have served on the standing committees, we owe a debt of gratitude.

On behalf of our state association, I want to compliment the members of the Northwest District Medical Society and express our gratitude for the excellent program and entertainment which they have arranged for us.

The incident I am about to relate took place not long ago at the annual banquet of an eastern state medical society at which Doctor Van Etten, president-elect of the American Medical Association, was the guest speaker. His opening remarks were, "What kind of medicine do you want? Do you want England's medicine or Hitler's medicine or Stalin's medicine or New Zealand's medicine or American medicine? Do you want socialized medicine or state medicine or democratic medicine?" At this point one physician, who had taken one cocktail too many, shouted, "Democratic medicine—hell no!" This story is not told for the element of humor, but to direct your attention to a question which is of vital concern to our profession.

In these days of a rapidly changing social order we, as physicians, find ourselves fighting to safeguard our traditional policies, attitudes and processes. For some time we have found it increasingly difficult to adjust ourselves to the activities of the younger professions in the health fields, for example, medical social service, psychiatry, sanitary engineering, laboratory technology, public health administration, dietetics and a host of others. These newer professions are demanding more and more participation in the responsibilities which, until recent years, were exclusively ours. Because of the enthusiasm shown by these new groups, many of us have questioned their motives and programs and have regarded them as young upstarts, revolutionary, unethical and incompetent rivals. Yet, I believe these newer professions are making a serious contribution to the nation's medical resources. Let us not overlook the fact that they now have a permanent place in our social order. We cannot be indifferent or disinterested in the programs which they are promoting to improve the health of our nation. This does not mean that we should approve all of their programs or the methods by which some have attempted to discredit our profession.

*Presented before the North Dakota State Medical Association, fifty-third annual session, May 6-8, 1940.

No longer can we hark back to the good old days. It is necessary for us to face certain facts and certain new social and economic trends in our nation and adjust ourselves accordingly.

Social and economic philosophy has, in recent years, projected health into a position of national importance. The public of today is more health conscious and better informed on the advances in our science than ever before. They are asking themselves to what extent these scientific findings can be put to more effective uses to improve the personal and community health of our country. If my observations are correct, they are demanding that this knowledge, which is ours, be put to work promptly and widely for all. I am of the opinion that as long as the present economic conditions exist, the public will continue to focus its attention upon the needs of the masses. If this be true, there is a great danger that through our indifference and failure to recognize public health services as social problems, we may find the state taking over health services for the individual as well as for the community.

Medicine is confronted with two new sets of conditions. On the one hand is widespread unemployment, low farm income and the continuation of conditions of general depression which have made it difficult for an ever increasing number of people to pay for the best medical services and proper hospitalization out of their earnings. On the other hand, there is the trend, worldwide in scope, towards government paternalism and a false suicidual doctrine that the state can provide a service and security that the people cannot otherwise obtain.

In the United States there are those who seek to establish political control of medicine and medical practice. Their arguments are plausible and alluring. They are sponsoring changes that, in many respects, are vicious, and, in order to secure public support, they have resorted to methods to destroy the people's confidence in American medicine and, to a degree at least, to discredit the practicing physician.

Notwithstanding the unparalleled health record of our nation, a definite campaign to bring about radical changes in the practice of medicine in our country has been carried on through newspapers, magazines, the radio, from the public platform and by word of mouth. In this movement the American system of medicine is often depicted as being backward, selfish, conservative and indifferent to public needs. The public is being taught that medical and hospital services are unavailable in sparsely settled and inhospitable areas and should be provided by the government. The public is being schooled in the belief that only the government can provide medical care that will insure to each and every one the maximum efficiency in the treatment of disease.

Among those who seek a change in our system are the politicians who regard a government-controlled system as a service of votes and many unthinking and misguided social workers see in it a means of obtaining unlimited professional care, not realizing that it also means a cheap and inferior type of service. A presidential election will be held this fall and it is not unlikely that public health may be injected into the campaign. May I remind you that Germany's Iron Chancellor, Bismarck, used the Krankenkasse (German Health Insurance) as a political measure to defeat the opposition in 1883 and Lloyd George in England in 1911 defeated his opponents with the Health Panel System? It behooves us to be alert to any comparable attempts to change our own system in the coming election.

Whatever criticism may be aimed at organized medicine, the records disprove that we have been backward, selfish or indifferent to public needs. We must admit that we have been too conservative and this probably accounts for the situation in which we find ourselves. We have been so engrossed in our work in the prevention, control and curing of disease that we have failed to keep the public fully informed of the progress and the superiority of medicine under the American system. Many in our profession believe that it is time for organized medicine to step out from its conservative shell.

One of the challenges to medicine today is educational. While we are not educators in the schoolmaster sense, we are teachers every day of our lives, whether we realize it or not. Not only is there the challenge to teach individual health to our patients, but to enlighten the entire population as to medicine generally, the history, the accomplishments and the aims of the profession, remembering always that the true viewpoint of medicine is that of the public, the common good and the gradual building of a healthier and better citizenship. For such an educational campaign to be effective, it is obvious that the teacher must be better informed than the pupil. To get our message to the public every available means should be used, especially civic clubs, parent-teacher associations, women's clubs, the forum generally, the cinema, the radio and especially the press. There are many in organized medicine who now favor the placing of dignified, paid advertisements in the daily newspapers to bring to the people the aims and accomplishments of medicine and its value to the public. In our own state we have too long neglected the opportunities to inform the people of the record of organized medicine.

I am sure we are all deeply conscious of the improvements to be made in the distribution of medical care and the need for us to assume our proper place in personal and community health planning.

One of the presenting challenges confronting medicine is to enumerate a sensible and practical health program and to work unceasingly for its adoption. In the preparation of such a program for our state, it would seem to me to be highly desirable to invite the dental profession to collaborate in the work. Such a program must provide time for its development and must be evolutionary instead of revolutionary.

Our American system of medicine has stimulated the greatest progress ever known to mankind and we must be ever on the alert to oppose any attempts to replace it with untried schemes or European importations. The question propounded by the president-elect of our national organization, and quoted at the beginning of this address, is a timely one for all who are actively engaged in the practice of medicine. You and I who believe in our American system of medicine must dedicate ourselves anew to its preservation.

The Nature of Various Mill Dust Allergens*

F. W. Wittich, M.D.
Minneapolis, Minnesota

THE mill dust allergens considered in this discussion are those prevalent throughout the cultivated areas of the Middlewest and Pacific Northwest, the grain and milling centers of the same areas and to a greater or lesser extent the other parts of the country where there is cultivation and storage of grains, the making of flour and the sorting of seeds.

Our present knowledge of mill dust allergens, in the technical sense, requires one to use the word "nature" in very broad terms. Observations made in recent years would suggest that there are allergens of clinical significance in dusts produced in the making of cereals, flours and the like.

Prevalence and Distribution of Grain, Flour and Seed Mill Dusts

Within the city limits of Minneapolis there are 14 flour mills of the larger type, 16 small feed manufacturing and distributing plants, 40 terminal elevators and 7 wholesale seed plants. A very conservative authoritative estimate of the number of employees in the mills and offices near the mills, as mill workers, state and federal weighers, inspectors and grain exchange employees totals about five thousand. A recent survey[1] shows that approximately one-fourth manifest some form of respiratory or cutaneous allergy.

Superior, Duluth and Minneapolis are the centers for the storage, inspection, distribution and milling of approximately ten to fifteen million acres of grains while the Dakotas supply twice that acreage in wheat alone. Much of the grain is shipped to ports along the Great Lakes as far as Buffalo. These cities also have a large number of flour mills, grain elevators and seed mills.

Recently a meeting was called in Chicago by the Society of Grain Elevator Superintendents to consider dust prevention in terminal grain elevators as a result of the explosion and fires in elevators there last May. At that meeting the chief of the Chemical Research Division of the United States Department of Agriculture indicated that in the past ten years there were 66 dust explosions in grain elevators. This is 36 per cent of the total dust explosions in industrial plants. These have been attributed to the prevalence of smuts by a federal investigator.[2] Smut spores are extremely combustible when beaten into a dust because of their oily nature.

Not only the handlers of grains and seeds manifest allergic symptoms. Persons living in rural districts of the grain belt area as well as city dwellers may experience this form of allergy.

"Miller's asthma" has been known as an occupational disease for years among flour mill workers. They associate it with the dust produced in the milling of flour. For this reason methods of conveying the dusts to the outside air have been installed. "Miller's asthma" has been confused with "thresher's asthma." "Thresher's asthma" occurs among workers in the fields during the harvesting and is characterized by symptoms of acute respiratory infection possibly complicated by a grain mold allergy, although pollens originating from weeds common to wheat fields as well as debris from the wheat itself and other vegetation must be considered in such cases. Duke[3] attributed this to the irritation from the serrated hairs in the wheat dust, which originate from the grain spike.

Modern methods of milling flour and handling of the grain mill dust have been installed in the larger plants but the small flour mills and especially the seed mills are notoriously dusty and no effort is made to convey this dust from the mills. Our worst cases of asthma come from these latter mills. Modern mills have the dust collected by machinery into large cone-shaped bins known as "cyclones" which are located on the top floors of the mills and then blown into the outside air. Most of the buildings are old and contain a great deal of mill dust and many molds.

Office workers and people residing as far as eight blocks from the mills showed a high incidence of respiratory allergy. Thus in the grain belt areas of the Middlewest and Northwest, favorable conditions for producing grain dust sensitiveness prevail.

Allergen Content of Grain Mill Dusts

Although cereals are primarily ingestant allergens, the various grain mill dusts, especially in the feed mills where no effort is made to conduct the dust to the outside air, afford an ample supply of the grain itself for antigenic stimulation. Bakers and flour mill workers develop allergic rhinitis and asthma due to inhalation of the pure flour. Contact dermatitis due to the handling of grains occurs rather frequently in the inspection departments.

Aside from the allergenic property of the grains themselves, one first practical approach is to take a typical small flour mill dust which causes most symptoms and make a microscopic examination. Only that dust which is air-borne and collected from the overhead rafters and beams is used. The following is a list of the air-borne allergens observed in one slide of mill dust.

Wanamingo (Southern Minnesota) Mill Dust
1938

SMUTS
- Tilletia levis—Bunt of Wheat.
- Tilletia tritici.
- Ustilago zeae—Corn Smut.
- Urocystis (?)
- Other smuts (Ust. hordei, avenae, medians).

RUSTS
- Uredospores (graminis puccinia. Two other undetermined rusts).

COMMON AIR MOLDS
- Helminthosporium.
- Fusarium.
- Penicillium.
- Alternaria.

*Read before the Midwestern Forum on Allergy, Chicago, Illinois, January 14, 1940.

Hormodendrum.
Acrothecium.
Syncephalastrum.
Several unknown fungi.
POLLENS OF VARIOUS KINDS
Weeds, Grasses.
MANY BACTERIA.
INSECT FRAGMENTS.

Grain Smuts

The first case of allergy due to grain smut sensitiveness was reported by Wittich and Stakman[4] in 1937. It was noted that smuts frequently augmented the severity of the grain sensitive patients.

Systematic smut spore counts in various areas of Minnesota during the past four years have shown smuts to predominate over the common air molds and to occur before and after the ragweed pollinating season as well as late in the fall after killing frosts.

Wittich[5] in a clinical study of grain smut sensitiveness compared with ragweed pollen and the common air molds in 105 patients with respiratory allergy considered smut sensitiveness the most important in eight cases.

The nitrogen content of smutted grain dust is proportionate to the amount of smut which it contains. The more smutted the grain the more severe the symptoms. Incidentally, the fat content of smuts averages 3 to 10 per cent by weight and it is possible that contact dermatitis which occurs from badly smutted mill dust is in part due to the smut which it contains.[6] The author observed a severe case where the patient was definitely sensitive to the aqueous fraction of the mill dust and to the oil fraction of mill dust and wheat smut.

Some patients who are sensitive to smuts have hay fever and asthma and they are not clinically sensitive to mill dust unless it contains its corresponding smut.

Although grain smut allergy and grain dust allergy are closely related, they must not be confused as being the same allergens.

E. W. Phillips[7] in the Phoenix area, based on endermal testing with Johnson grass smut (sphacelotheca sorghi) during the past five years, observes "that the time for sensitization to this smut has been about five years" or double the time required for sensitization to a newly acquired sugar beet pollen in his district.

Recently Harris[8] reported 13 cases of allergic rhinitis and asthma where carefully controlled experiments suggest grain dust and grain smut as definite etiology. He indicated by cross reaction tests a possible close antigenic relationship between the grain dusts and grain smuts. He made observations of practical value in testing and treating grain dust sensitive cases. Harris found wheat dust and oat dust have a common antigen. Wheat did not desensitize sites sensitive to wheat dust, but wheat dust desensitized sites sensitive to wheat. Wheat dust and wheat smuts were found to have a common antigen and similarily oat dust and oat smuts have a common antigen. Although different grain smuts show some cross reactions, there is no antigen common to all of the smuts. Significantly he found that no relationship between the common air molds and grain dusts could be demonstrated.

As the smuts are obligate parasites, it is reasonable to expect some of the grain substance to be contained in its corresponding smut. The majority of cases, clinically, showed a slightly greater sensitiveness to the common air molds in our district.

TABLE I

Results of 135 patients clinically sensitive to grain mill dust, smuts and common air molds. This represents 27% of 500 allergic patients routinely tested.

Common Air Molds	Smuts	Grain Mill Dust
82.9%	76.3%	62.9%

When wheat is cleaned in a mill it is always found contaminated with oats due to harvesting and storage. The first process of milling is to separate the oats from the wheat. All wheat dusts contain some oat dust, hence the common antigen. Sites sensitized to wheat dust were not desensitized by wheat probably because of the wheat smut the dust contained. Also, sites sensitized to wheat, desensitized by wheat dust in all probability were due to the wheat antigen in the wheat dust.

Preparation of Mill Dust Allergens

A typical dirty old flour mill dust as well as so-called wheat and rye dust were used. After defatting with water-free ether and carbon tetrachloride, 20 grams of dust were extracted with 50 cc. of Coca's bicarbonate saline extracting fluid containing 1:10,000 merthiolate and 50 cc. of distilled water for forty-eight hours. After filtering through paper suspended in a cellophane sausage and allowed to evaporate to half the original amount, it was dialyzed against changes in the fluid used in extraction through which carbon dioxide was bubbled frequently. The fluid was passed through a Seitz filter. It was found that an endermal reaction of two plus or more of 1:10 dilution of this extract was present in at least 80 per cent of the cases clinically sensitive to mill dust while the controls were negative. This was checked by sufficient passive transfers to consider the extract clinically satisfactory. The other mill dusts were extracted and standardized in similar manner and used for endermal testing in the series reported in table I. The smut chlamydospores were defatted with water-free ether, extracted in Coca's solution for forty-eight hours, passed through a Seitz filter and a 1:500 dilution was used for endermal testing. In order to avoid a series of cross sensitization tests on patients, gross anaphylaxis and Dale tests were done to determine the antigenic relationship of grain mill dusts and smuts.

Methods

Extracts of a dirty feed mill dust and a so-called "wheat dust" and "rye dust" and wheat and rye smut were made in the manner described for skin testing.

The guinea pigs were from a reliable source and as they had been fed lettuce, carrots and oats, oat dust was not used in this series. The average weight of the animals was 200 grams.

Alum precipitates were made of these extracts in the following manner: 20 cc. of the saline extracts adjusted to a pH of 7.8 with N/1 sodium hydroxide solution was precipitated by 10 per cent aluminum potassium sulfate solution making a final concentration of 1 per cent.

TABLE II.
Results of Intravenous Shock Antigen

Guinea Pig Number	Sensitizing Antigen 12,000 Protein Nitrogen Units	Days Between Injections	Testing Antigen 25,000 Protein Nitrogen Units	Result
4	Feed Mill Dust	21	Feed Mill Dust	Severe Shock
5	Feed Mill Dust	21	Wheat Mill Dust	Very Severe Shock
6	Wheat Mill Dust	22	Wheat Smut	Moderately Severe Shock
7	Wheat Mill Dust	22	Wheat Smut	Mild Symptoms
8	Rye Mill Dust	23	Rye Smut	No Symptoms
9	Rye Mill Dust	23	Rye Smut	Mild Symptoms

TABLE III
Results of Uterine Horn Responses

Guinea Pig Number	Uterine Horn	Days Between Injections	Sensitizing Antigen 12,000 Protein Nitrogen Units	Testing Antigen 25,000 Protein Nitrogen Units	Uterine Contraction
10	1 2	21	Feed Mill Dust	Feed Mill Dust	+ + + + + + + +
11	1 2	21	Feed Mill Dust	Feed Mill Dust	+ + + + + + + +
12	1 2	22	Wheat Mill Dust	Wheat Smut	+ + + +
13	1 2	22	Wheat Mill Dust	Wheat Smut	+ +
14	1 2	23	Rye Mill Dust	Rye Smut	± or ? ± or ?
15	1 2	23	Rye Mill Dust	Rye Smut	+ +

This was allowed to stand for twenty-four hours at 10° C. It was centrifuged and the precipitate was washed twice with physiological saline solution containing 1:10,000 merthiolate. The suspension was used in this form for sensitizing guinea pigs. The dust and smut extracts were standardized on the protein nitrogen content (1 unit = .00001 mg. protein nitrogen) as determined by phosphotungstic acid precipitation.

Twelve guinea pigs (6 males and 6 females) received 12,000 units each of the alum precipitate suspensions subcutaneously as a sensitizing dose. Twenty-one to twenty-three days later six received the testing antigen intravenously and six were tested by the Dale method. Table II shows the results of the intravenous shock dose and table III shows the uterine horn responses.

These few preliminary tests, as well as forty-five subsequent animal tests to be reported later, would indicate that mill dusts can produce anaphylaxis and that there is an antigenic relationship between the grain dusts and their parasites, the smuts.

The author has found that an extract of a dirty mill dust will hyposensitize 85 per cent of the clinically sensitive mill dust cases as well as many of those sensitive to both mill dusts and smuts, and that only in an occasional primary smut-sensitive case it is necessary to use smut extracts alone or combined with the dust extracts.

The evidence, therefore, that smuts are clinically important as allergens in grain mill dusts can be summarized as follows:

Smuts as Allergens

1. Grain smuts were shown to predominate numerically in the Grain Belt regions over the other air-borne allergens and occurred in larger numbers before, during and following the weed pollinating season.

2. Smuts have been proven to possess a definite excitant of hay fever and asthma and in some cases to be quite toxic.

3. Grain smuts are smaller than the majority of air-borne allergens and are widely and abundantly distributed.

4. The total nitrogen content of smuts averages two-thirds that of the weed and grass pollens.

5. Smut sensitiveness can be passively transferred in the majority of cases.

6. Nasal and ophthalmic tests with the dry smut powders or extracts produce typical allergic responses in smut-sensitive cases.

7. Evidence has been obtained to indicate an immunologic relationship between the smuts and their corresponding hosts, the grains.

Rust in Grain Mill Dusts

In 1924 Cadman[9] reported cases of allergy due to grain rust. Waldbott and Ascher[10] recently observed seven patients in the Detroit area "who had symptoms exclusively during the rust and smut season and twelve

who suffered definite exacerbations at the time." They obtained stronger skin reactions with rusts than with smuts and believe that rusts are a more important antigenic factor in their region.

Very few skin reactions were obtained in the Minneapolis section with rusts. This was thought to be due to the fact that rusts are not nearly as constant a factor as smuts are and because rusts did not seem to possess a very definite excitant of hay fever.

Common Air Molds

Mill dusts contain many common air molds. Cultural surveys of molds made the past year in Minneapolis in connection with another investigation showed the plate counts of *Alternaria* to be in excess of any other mold. *Hormodendrum* was second, yeasts third, *Aspergillus* fourth and the others in negligible amounts.

This differs from the slide counts as *Hormodendrum* occurs far in excess of *Alternaria* and *Helminthosporium* and at times appears in very large numbers. *Helminthosporium* is quite common in the Minnesota grain mill dusts. *Penicillium* grows in the mill dusts and is quite common in some of the old dusts.

From clinical observations of mold sensitive patients, molds seem to be a very definite factor when present in appreciable numbers. A large number of mill dust and smut-sensitive cases show positive tests to common air molds as well.

Pollens in Grain Mill Dusts

Pollens are brought into the storage elevators during their seasons in large numbers with the harvest grains. The flour mill workers with respiratory allergy can have marked exacerbations of symptoms during the handling of this pollen-laden grain. Figley[11] observed a feed mill worker with contact dermatitis due to ragweed. He was successfully hyposensitized with an oil extract of ragweed.

The author had a similar case where patch tests showed a marked reaction to mill dust oil as well as a severe one to the ragweed oil.

Bacteria in Mill Dusts

It is questionable whether bacteria, which occur in large numbers in mill dusts, possess any significance as antigens.

Allergens of Entomogenous Origin in Grain Mill and Seed Mill Dusts

Recently the author[12] reported two cases of allergic rhinitis and asthma occurring in a seed mill. These were found to be due to a species of weevil (*Zabrotes subfasciatus Boh*) with significant clinical, immunologic and entomologic data.

The Indian Meal Moth (*Plodia interpunctella Hbn*) which infests shelled seed corn in which the epithelium of the wings occurs in large numbers causes respiratory allergy and positive skin tests are obtained.

Grain or flour mites (*Tyroglyphus farinae DeG*) are very numerous in all sorts of cereal products, cottonseed and flaxseed meals, grains, cheese, meats, dried fruits, bulbs, plant roots, skins, hairs and feathers. Extracts of the flour mites produce strong reactions in some of the mill dust-sensitive cases. They are present in all flours and cannot be killed by the chlorinating process which is given to flour in "aging" or "bleaching." The mites impart a sweetish musty odor to the flour.

Psocids or book lice (*Troctes divinatorius Mull*) cause respiratory allergy in grain bin cleaners. They can be gathered in large numbers in the storage elevators. Extracts of book lice produced definite skin reactions in two storage bin workers clinically sensitive to mill dust. The reagin of book lice was successfully transferred to the normal skin in one case.

Summary

1. The results of a four year survey and study of the nature of the various mill dust allergens in Minnesota together with clinical observations are presented.

2. The grains themselves, various pollens, smuts, common air molds, rusts, bacteria and insects in grain and seed mill dusts are shown to have a relative importance in producing respiratory and skin allergy.

3. Skin tests, nasal and ophthalmic tests, passive transfers, cross testing *in vivo* and *in vitro* as well as gross anaphylaxis and the Dale test with extracts of the various components of the mill dusts and the mill dusts themselves prove their antigenic relationship and importance as allergens.

4. In treatment, a properly selected mill dust hyposensitizes the patient in 85 per cent of the cases who show clinical and test reactions to the various allergens contained therein.

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Capsella Bursa Pastoris as a Hemostatic After Prostatectomy

Arthur J. Greenberger, M.D.
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THE extract of Capsella Bursa Pastoris (Shepherd's Purse) has been used empirically as a hemostatic agent for many years. Studies by many workers have revealed several known active principles in the extract, but its mode of action has remained undetermined. Clinically, it has been used in several branches of surgery where there is a possibility of postoperative bleeding, such as in tonsillectomy and in both suprapubic and transurethral prostatectomy.

We began using this preparation following observation of its use in urologic clinics abroad.

Recently, there has been a renewal of interest in the pharmacology of the various hemostatic and anticoagulant agents. This has been especially noted in the vitamin K—prothrombin relationship to postoperative bleeding and in the use of the heparin treatment in subacute bacterial endocarditis.

We have used an unmodified extract of Capsella Bursa Pastoris (styptysate) following prostatectomy during the past ten years, as an adjuvant to the routine preoperative and postoperative treatment. Since postoperative hemorrhage is a major complication of prostatectomy, we believe a report and analysis of our experience in use of this preparation is warranted.

All of the patients who were treated with this drug were either private patients* or patients on ward services of private hospitals (table I). Suprapubic prostatectomies were performed on 503 patients between 1930 and 1939. In this group, there were three postoperative hemorrhages, requiring repacking, but there was no mortality due to hemorrhage. Transurethral resection was performed 225 times from 1936 through 1939. There were no cases of immediate postoperative hemorrhage and only one case of severe delayed hemorrhage occurring three weeks after resection and requiring cystotomy and packing. One fatal pulmonary embolism occurred after transurethral resection; this single incident gives us no reason to believe it was caused by administration of the drug. The extract had been given to all of these patients since we felt that its efficacy did not warrant the withholding of this medication from a control series. For such a comparative study, and for statistical evidence as to the value of this extract, groups of untreated cases reported by other urologists should be adequate. Present technique and methods of management do not vary extensively.

The routine of administration of the extract became more uniform with use over a period of years. It was administered both preoperatively and postoperatively to patients undergoing suprapubic and transurethral prostatectomy (table II).

*Jewish Memorial, French, and Polyclinic Hospitals.

TABLE I

Type of Prostatectomy	Cases	Immediate Postoperative Hemorrhage	Delayed Postoperative Hemorrhage	Mortality Due to Hemorrhage
Second Stage Suprapubic	503	3 (required repacking)	None	None
Transurethral	225	0	1 (required cystotomy and repacking)	None
Total	728	3	1	None

TABLE II

Type of Prostatectomy	Preoperative	Postoperative
Second Stage Suprapubic	1 cc. Styptysate intramuscularly every 6 hours for 24 hours	1 cc. Styptysate every 4 hours for 24 hours
Transurethral	1 cc. 24 hours and 1 cc. 18 hours before operation	1 cc. Styptysate every 4 hours for 24 hours

In this series, the ages varied from 47 to 96, the average being 65. These cases included patients with all types of prostatic changes, and a number of them were complicated by features common in this age group, such as arteriosclerosis, both generalized and coronary, diabetes, hypertension, and varying degrees of impairment of renal function. Management of these phases in urologic patients has been well described in the literature.

Discussion

We feel that this drug may be a factor in giving such a low incidence of postoperative bleeding and for this reason, deserves further clinical and experimental investigation. We have found no contraindication to its use as an adjuvant in the operative relief of prostatic obstruction. It had been previously reported to be of value in tonsillectomy and menorrhagia.

Originally used as a substitute for ergot, it was not found to be a powerful enough oxytocic and hemostatic, and according to Moreno, the pure preparation has no pronounced effect on the uterus. Heffter stated that it produced effects on the uterus, only when contaminated by fungus.

Snell and others emphasize the limitations in the value of administration of vitamin K in influencing hemostasis, except in conditions where a deficiency exists. Since there are no available studies of the vitamin K—prothrombin relationship in patients undergoing prostatectomy, the value of the Shepherds purse extract cannot at present be explained on this basis. Newcomb

states that this extract is especially high in vitamin K content (over 10,000 Ansbacher units per cubic centimeter), and he also states that it reduces the bleeding and clotting time by more than fifty per cent.

Styptysate has been found to have little effect on the blood pressure. Boruttau and Cappenberg found fractions which both elevated and depressed the blood pressure and specifically isolated choline, acetylcholine and tyramine from the weed. Bertrand found a higher content of manganese in Capsella Bursa Pastoris than in any other plants which he tested. However, no specific hemostatic fractions, other than vitamin K have been proved.

Summary

1. An extract of the weed, Capsella Bursa Pastoris (Shepherd's Purse) was used as an adjuvant in 728 prostatic operations.

2. Only four cases of both immediate and delayed hemorrhage occurred, with no mortality due to hemorrhage.

3. Comparison with series of untreated and treated cases by other urologists, together with further investigative work, will be necessary to more accurately evaluate this drug as a hemostatic agent.

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Book Reviews

The 1939 Year Book of Neurology, Psychiatry, and Endocrinology, by Hans H. Reese, M.D., Professor of Neurology and Psychiatry, University of Wisconsin Medical School; Nolan D. C. Lewis, M.D., Director, New York Psychiatric Institute and Hospital, Professor of Psychiatry, Columbia University; Elmer L. Sevringhaus, M.D., Professor of Medicine, University of Wisconsin Medical School; 761 pages; Chicago: The Year Book Publishers: 1940.

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This excellent member of the family of *Year Books* should be ready to hand on the bookshelf of the practicing physician. The diverse subjects covered in this volume are united in the common need of every physician for knowledge in neurology, psychiatry, and endocrinology. Much space in the three sections is devoted to therapeutics. Sulfanilamide and related compounds, vitamin B_1, mapharsen, and pharmacologic shock are given much attention. The numerous editorial comments throughout the section on endocrinology illuminate the text and aid materially in understanding the implications of the articles.

Shock, Blood Studies as a Guide to Therapy, by John Scudder, M.D., Med.Sc.D., F.A.C.S., from the Surgical Pathology Laboratory of the College of Physicians and Surgeons, Columbia University; 315 pages with 55 illustrations; Philadelphia: J. B. Lippincott Company: 1940.

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The author has investigated shock of operation, trauma, hemorrhage, burn, and other conditions. The blood studies measure plasma and cell potassium levels, hematocrit determinations of relative cell-plasma volume, protein levels, and whole blood specific gravity. This last measurement is made with the Barbour and Hamilton falling drop method based on timing the fall of a drop of blood through a non-miscible fluid. The author is able to discover an increase in specific gravity long before the occurrence of the classical shock findings of hemoglobin concentration, fall in blood pressure, and loss of body heat. The value of the determination of blood specific gravity is well shown. An eight page appendix details all the laboratory procedures discussed.

Scudder makes a great point of the use of massive doses of adrenal cortical extract to combat hyperpotassemia. His treatment with saline infusions, blood and plasma transfusions, and external heat is standard. He has not enough cases to establish the value of the newer feature of his therapy, the use of the cortical extract. His contribution to the problem is the more accurate and earlier diagnosis of shock.

Electrocardiographic Patterns, by Arlie R. Barnes; Minnesota: The Mayo Clinic: 1939. Price $5.00.

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This monograph deals with a study of the electrocardiographic patterns of diagnostic importance in certain types of heart disease. It represents the experiences of the author and an accumulation of material over a period of more than ten years.

It should be of practical value to the specialist in cardiology and internal medicine.

Essentials of the Diagnostic Examination, by John B. Youmans, M.D., Associate Professor of Medicine and Director of Postgraduate Instruction, Vanderbilt University Medical School; 417 pages; New York: Oxford University Press: 1940. Price $3.00.

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Office physical diagnostic and laboratory procedures are well described in this handy pocket sized manual. The section on the physical examination is a digest of material covered at greater length in several standard texts on physical diagnosis. Heart murmurs are nicely presented graphically and phonetically. History taking is slighted, allotted less than fifteen pages.

The third part of the book really accomplishes Youmans' avowed purpose of simplifying and systematizing office diagnosis. Here is presented important laboratory procedures, their technique and interpretation, and directions for setting up an office laboratory complete to the last foot of rubber tubing. An author attempting to cover the subjects of history taking, physical diagnosis, and laboratory technique in one small volume must sacrifice much in the name of brevity. Repeated use of "enervation" for "innervation" is insignificant but irritating. The bibliography is small and carefully selected. An entirely adequate index is invaluable for quick reference.

The 1939 Year Book of General Therapeutics, edited by Bernard Fantus, M.D., Professor of Therapeutics, University of Illinois College of Medicine; 512 pages; Chicago: The Year Book Publishers, Inc.: 1939. Price $2.50.

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This member of the *Year Book* series is always welcomed by those who wish to remain abreast of advances in general therapeutics, inasmuch as Dr. Fantus manages to bring together in the scope of a relatively small volume practically all that is new and much that is being found serviceable among recent therapeutic advances. The book is divided into sections dealing with physical measures, the use of biologicals, the use of chemical therapeutics, etc. By use of the excellent index to be found at the end of the volume, one may speedily find reference to the latest and best information.

The reviewer feels that this book is thoroughly useful and because of its reasonable price should certainly recommend it to all those engaged in the practice of medicine regardless of what special field may be theirs.

The
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NORTH DAKOTA STATE MEDICAL ASSOCIATION

The fifty-third annual meeting of the North Dakota State Medical Association, held in Minot last May, was outstanding. The proceedings of the House of Delegates to be found elsewhere in this issue of the JOURNAL-LANCET, bear testimony that the Association's official governing body transacted business of great importance to all members.

The attention of every member is directed to the excellent Committee Reports. They indicate the need for a close study of existing conditions in our state, particularly as to governmental health activities and the effects that such activities are exerting upon the private practice of medicine, as well as the health of the people. The state department of health realizes that no health program can succeed without the wholehearted support of the medical profession and it is gratifying to note that the department has coöperated fully with the Committees on Maternal and Child Welfare, Venereal Diseases, Public Health, Pneumonia Control, Tuberculosis, and Cancer. Other governmental agencies have likewise sought the advice of the Committees on Medical Economics and Crippled Children. This spirit is commendatory and indicates the need for an active interest in the affairs of the Association by every one of its members.

A few years ago a special committee was appointed to study the advisability of amending the Constitution and By-Laws, which time and progress seemed to have antiquated. After much study the Committee made its report at this year's meeting, and a new Constitution and By-Laws were adopted. The following changes are noteworthy:

1. A member may belong to that district society most convenient for him to attend, provided the society, in whose jurisdiction he resides,

does not object.

2. Only the delegates elected by the component district societies, shall constitute the House of Delegates. Past Presidents and present officers have the privilege of the floor but can not vote.
3. A Speaker of the House of Delegates, elected by the House, is provided.
4. The Council is given authority to act for the Association in the interim between meetings of the House of Delegates.

The House of Delegates voted to double the dues for 1941, and to employ a full-time secretary. It has been realized by all who have followed the affairs of the Association that no secretary could function properly under the old plan of a limited budget. The routine duties of the office have increased immeasurably during recent years because of the ever-increasing health activities of governmental agencies. There has also been a growing need for someone who had the time and the ability to serve as a liaison officer between the Association and the public, particularly the legislature. Many felt that the Association should have a full-time secretary to meet these needs and, accordingly, the House of Delegates, at its meeting in 1939, authorized the Council to study the problem, and doubled the membership dues for 1940 in anticipation of such a move. However, the Council found after due consideration, that the income of the Association in 1940 would not be sufficient to cover the budget for a full-time secretary. It did find that a part-time secretary could be provided with sufficient funds to employ a part-time stenographer and defray the necessary travel expenses of the secretary. When the action of the 1940 House of Delegates was known to those in attendance at the convention in Minot, it was apparent that many members did not favor an increase in the dues. For that reason the House voted to refer the question to the membership of the Association. The secretaries of the component district medical societies have been instructed to conduct this referendum vote before December so that the 1941 dues can be fixed and plans made if a full-time secretary is approved. It is hoped that every member will use his franchise to vote on this important question. Full-time secretaries are established and important factors in the machinery of many state medical associations. They are doing much to strengthen their association. Obviously, they cost money which must be raised through the dues paid by the members.

Some of our members contend that our Association is too small to warrant a full-time secretary. Others insist that a full-time secretary will more than pay for himself through the service he renders, and the new members he will attract. It is a question which properly belongs to the membership for solution. The House of Delegates, after due deliberation, considered it a wise move. The members are asked to make a final decision for it is their money and their association.

L. W. L.

HEALTH AND NATIONAL DEFENSE

At the time the United States entered the World War, it was recommended that X-ray plate inspection of the chests be made of all persons in the army and navy. This was objected to on the grounds that a long time would be required to expose and develop so many plates, and that the expense would be great. Moreover, it was contended that good physical examinations would reveal all pulmonary lesions.

Subsequently, at great expense we learned much about pulmonary tuberculosis. Many soldiers who were admitted to service on the basis of negative physical examination of the chest actually had progressive, pulmonary tuberculosis at the moment, and others who were infected at the time they entered the service developed clinical lesions while in service, or subsequently. Indeed, well over one billion dollars has been spent for hospitalization and compensation of veterans since the World War. We are still talking about the loss of life in the war from causes other than disease and, yet, few persons seem to realize that each year during and since that time, more of our citizens have died from tuberculosis than were destroyed in the war.

X-ray inspection of the chest is capable of revealing lesions in the lungs long before they cause symptoms or produce abnormal physical signs and become contagious. Although we are unable to determine the etiology of disease accurately by X-ray inspection, the fact remains that disease is located, after which other methods of examination and observation are available to determine the etiology.

About 1931 an X-ray camera was invented which was capable of making two to four chest exposures every minute, and in order to obviate a large volume of work, paper film was prepared in rolls long enough for one hundred usual size chest films. Thus, the handling of films was reduced to approximately one-hundredth of the time required by the old method. Best of all, the paper film proved to be as valuable in detecting areas of disease as film on glass or celluloid, and the entire cost of the finished product is so small as to make X-ray inspection of the chest available to everyone. This rapid, paper film method has been extensively used in such places as the New York City Health Department, the Lymanhurst Health Center, and the Students' Health Service of the University of Pennsylvania. Those who have used it on a sufficiently large scale to justify an opinion are enthusiastic in its praise, because they realize it has solved one of the most important problems in the field of chest diseases.

On May 27, 1933, Colonel Meyerding published an article in the *Journal of the American Medical Association,* in which he advocated adequate examinations of the chests of all persons in military service. He presented the reasons for and the method of making these examinations. Apparently, little has been done by our army and navy to determine who in the service is infected with tubercle bacilli and who has clinical lesions in the presymptom stage. This should be done for all adults of the nation. Our army and navy should now set the example.

J. A. M.

Societies

TRANSACTIONS OF THE MINNEAPOLIS CLINICAL CLUB

Stated Meeting Held March 14, 1940
The President, Dr. James K. Anderson, in the Chair

INTESTINAL OBSTRUCTION IN A HEMOPHILIAC
(Case Report)

Abstract

ERLING S. PLATOU, M.D.

A case of intestinal obstruction in a hemophiliac was reported. The case is of special interest because it is known that surgery of the abdomen in these cases presents usually unfavorable prognosis. There was visible peristalsis and a typical X-ray picture of obstruction. The use of Wangensteen's suction completely relieved the condition in a few hours. It is therefore assumed that it was a hemorrhage in the bowel rather than an intussusception. This case is to be published in greater detail.

LOCALIZED RAREFYING DISEASES OF BONE

Abstract

Complete article to be submitted for publication.

JOHN F. POHL, M.D.

The paper was concerned with the presentation of several cases of benign bone cyst which had been treated by curettage and the implantation of bone chips. In one case the tissue removed was suspected of malignancy, but the healing of the lesion supported the clinical and X-ray diagnosis of benign cyst. It was pointed out that bone is a tissue which is extremely limited in its capacity to react to diseases which attack it. In the main, bone exhibits only varying degrees of either increasing or diminishing density in the roentgenograph. Familiarity with the way in which these simple processes manifest themselves is important in distinguishing between benign and malignant diseases in bone. It is usually possible to make a correct diagnosis with a high degree of accuracy.

DISCUSSION

The pathology of benign bone cysts was discussed (by invitation) by Dr. Harold Freedman, Fellow in Pathology, Minneapolis General Hospital. Several lantern slides showing the histological variations of several of the cysts were demonstrated. It was pointed out that the histological structure may vary greatly in the benign bone cyst.

Dr. M. O. HENRY: "I have already expressed my ideas on the treatment of these cysts in a paper I wrote about five years ago, the essentials of which Dr. Pohl so ably presented.

"One more word of caution should be extended to you men who may see these cases after we are through with them; remember Dr. Pohl's first case, that he thought was cured and which came back later with a recurrence.

"It happens that one of the first cases I ever treated when I came to Minneapolis was one of these fractures through a cyst and at that time we treated the fracture feeling that it would heal the cyst. It *did* for about fifteen years and then the girl came back with a tremendous extension of her cyst. We think we have them cured by filling the cavity very tightly with chips. If the patient does come back with the extension of the cyst near the site of the earlier cyst, it probably wasn't the fault of the surgeon. We have to do a very extensive dissection to be certain that all of the cyst is removed. — Just a word of caution that they *do* come back sometimes and they should have a second operation."

Dr. JOHN H. MOE: "When one sees one of these fractures with a cyst I think he has the choice of two procedures,—one of them is to let it go ahead and heal and see if it is going to cure itself, and the other is to go in and operate.

"I think on the whole it is a little easier surgery if you let it heal first and do the surgery later. This is a matter of opinion and I do not think the end result will show very much difference.

"Once in a while on pathological study on these things one finds a rather marked bone reaction and occasionally you get a diagnosis of malignancy brought back when there is no malignancy, just a matter of hyperplasia of bone tissue with young cells that are growing pretty fast."

Dr. DOUGLAS HEAD: "Do these cysts ever spontaneously disappear, outside of those that fracture?"

Dr. JOHN POHL: "There is what is called a latent cyst occasionally found in an adult. These probably have been present for years but have never given symptoms. They are picked up accidentally through some other procedure, for example, a portion of the humerus included on a chest X-ray might first show some lesion. Whether or not they ever completely disappear spontaneously would be difficult to say."

Dr. CYRUS HANSEN: "A few years ago a good many of these bone cysts were treated with X-ray therapy with apparently some favorable results. However, in most cases surgery is the treatment of choice and X-ray therapy, to a large extent, has been abandoned."

THE SYMPTOM OF HEADACHE

LAWRENCE R. BOIES, M.D.

It has been said that the most common symptom about which a patient consults a physician is that of headache. The ophthalmologist and the otolaryngologist encounters it every day in his clinical contacts.

The layman and many physicians are prone to attribute the symptom of headache to the sinuses when some obvious cause is lacking. The widely prevalent symptoms of transient nasal congestion, and the common post-nasal discharge have centered attention on the nose. More objectively, the irregularities of the nasal septum and X-ray evidence of sinus pathology have suggested the possibilities of this apparent close anatomical relationship.

I believe that our mistakes in evaluating the role of the nasal space in the symptom of headache, particularly a chronic one, are due, first, to an inadequate history and, second, a lack of information on the problem of headache in general.

Headache is defined by our Standard dictionary as "a pain in the head." This is a practical definition. The layman labels as headache any discomfort in the head ranging from a relatively mild sensation of tightness or pressure to the lancinating pain of trigeminal neuralgia or the severe pain paroxysms of an expanding central lesion. It is practical, therefore, to make no academic distinction on the basis of the type of pain, but to survey the symptom as a whole.

ANATOMY

When we consider the anatomy of headache, the important structures within the perception area of a headache which may participate in producing this symptom are as follows:

1. The brain and its contents.
2. The envelope of the brain: pia, arachnoid, dura.
3. The nerves: trigeminal, vagus, hypoglossal, sympathetic, the superior cervical ganglion, and the great and the small occipital.
4. The muscles and the fascia of the posterior part of the neck.

The brain substance is insensitive except along certain of the larger vessels and the dural sinuses. The dura receives its nerve supply partly from the sympathetic filaments which accompany the arteries and partly from the cranial nerves. The cranial nerves are the trigeminal, the vagus, and the hypoglossal. The branches from the trigeminal are derived from the three divisions of that nerve on each side. A branch from the nasal branch of the ophthalmic division goes to the dura in the anterior fossa; a meningeal branch from the ophthalmic division supplies the tentorium. A branch from the maxillary division of the trigeminal accompanies the branches of the middle meningeal artery. A meningeal branch of the mandibular division (nervous spinosus) passes into the skull through the foramen spinosum and is distributed to the dura mater over the great wing of the sphenoid (and by a posterior branch is distributed to the lining membrane of the mastoid cells).

The dura of the posterior fossa is supplied by a meningeal branch from the jugular ganglion of the vagus which is distributed around the transverse lateral sinus, and also by a menin-

geal branch of the hypoglossal which is given off in the hypoglossal canal.

The sympathetic filaments are distributed to the smooth muscle of the walls of the blood vessels.

The great occipital nerve from the second cervical and the small occipital from the second and third cervical nerves and the muscles and fascia of the posterior neck are important chiefly in the headaches due to myositis, fibrositis, etc., to be described later.

Observations on the Mechanism of Headache

1. A number of observers (Fay, Penfield, Craig, Elsberg, and others) have reported tests to determine brain sensitivity. The observations have been made on brain surgery cases under local or light basal anesthesia. Physical stimuli, such as pinching, traction, and the effect of heat and cold, have been applied. These observations indicate that most of the brain substance and a considerable portion of the meninges are not the sites of origin of painful sensations. The large dural vessels, particularly the arteries and possibly the dura itself adjoining the vessels, the venous sinuses of the dura, and the large arteries of the pia near the base, can be stimulated to produce pain.

2. Other investigators have experimented on the role of the blood vessels in the production of headache (Pickering, Forbes, Wolff, and Cobb, Schmidt, Schneider and others). Histamine seems to be a drug ideally suited for this purpose. A small amount, 1/10 cc. of a 1:1000 solution of histamine acid phosphate injected into the median basilic vein produces a headache regularly lasting from 1½ to 5 minutes and leaving no sequelae. During its action, cerebral as well as general arterial vasodilatation occurs. This general vasodilatation produces consistently a sharp drop of 10 to 40 mm. of Hg. in the systolic and diastolic arterial pressures coming on about 20 to 25 seconds after the injection of the drug. There occurs a simultaneous sharp rise in intracranial pressure due to the increased vascular bed. Then there occurs a rise in the arterial pressure after 20 to 30 seconds to normal or slightly higher, with a concomitant reduction in cerebrospinal fluid pressure. The dilatation of the cerebral vessels continues for a short time after the arterial pressure has begun to return. The cerebral flow is greatest when the systemic arterial pressure has ascended to normal after its initial drop. After the histamine injection there is an increase in the amplitude of intracranial pulsations. This increase represents an increased effect of cardiac systole on dilated cerebral arterial walls. The conclusion is made "that the increased amplitude of intracranial pulsations after histamine injection actually represents an increase in the stretch of dilated intracranial vessels with each cardiac systole; also that dilatation itself is not sufficient to increase the amplitude and blood flow if there is at the same time a fall in blood pressure. However, vasodilatation plus a normal systemic arterial pressure will cause an increased cerebral blood flow and increased amplitude of intracranial pulsations."

A marked increase in the intracranial pressure played no part in the production of the headache. The peak pressure usually occurred 10 to 20 seconds before the onset of the headache. "When the headache was of maximum intensity and the intracranial pulsations were maximal, the cerebrospinal fluid pressure was falling toward the resting level or had reached it." Raising the cerebrospinal fluid pressure to 500 to 600 mm. of water by injection of normal saline into the lumbar subarachnoid space, relieved the headache.

"These results demonstrate that the intensity of the headache is proportional to the degree of dilatation and stretch of the intracranial vessels and the perivascular tissue." (Clark, Hough and Wolff.)

3. Fay has conceived a "dual" mechanism in the production of headache:

"The symptom of headache in order to be properly interpreted and treated must be considered from two standpoints:

"(1) Stretch on pain end organs of the vascular tree due to distention of the vessels (hyperemia, increase in volume), or

"(2) Stretch on the pain end organs due to the overdistention of the subarachnoid spaces on the ventricles ('pressure' headache, increase in volume).

"Headache of the first type (hyperemic) may arise from extracranial conditions such as cellulitis of the neck and scalp, paranasal sinus infection, involvement of the tonsils, pharynx and mastoids. Here the cerebral circulation is the unwilling recipient of the increased blood volume designed primarily for the branches of the external carotid artery, but no mechanism exists at the bifurcation of the common carotid artery to direct the increased amount of blood sent by the heart and required by the infected areas so that it alone is confined to the external carotid distribution. The internal carotid shares in this increase of blood volume to some degree and the consequent rise in volume intracranially is frequently associated with headache.

"Headache as a symptom, therefore, may be considered as a direct involvement of the vascular pain network by distention and traction as the most common mechanical cause, although trauma, infection, and intrinsic inflammatory disease may involve them directly."

Classification of Headache

The attempts at classification of headaches have in general been unsatisfactory. The following scheme, modified from the plan of Auerbach, has seemed useful inasmuch as it is rather complete and directs attention to the basic condition of which the headache is a symptom.

A. *Independent forms*:
   1. Migraine.
   2. Nervous and mental states: nervous exhaustion, psychogenic, etc.
   3. Posterior neck conditions: myalgic, nodular (induration), hypertonic neck muscles, fibrositis, arthritis of the cervical spine, etc.
   4. "Erythromelalgia of the head."

B. *Headaches associated with disease of individual organs*:
   1. Brain disease: tumor, abscess, meningitis, encephalitis, hydrocephalus, pachymeningitis interna, cerebral and cerebrospinal syphilis, cerebral arteriosclerosis, epilepsy, trauma, etc.
   2. Eyes: refractive errors, muscle imbalance, pathological tension, inflammations.
   3. Nasal space: contact or congestive headache, empyema, Vidian or Sphenopalatine neuralgia.
   4. Teeth.
   5. Digestive tract, kidneys, pelvic disorders.

C. *Headache in general disease*:
   1. Infectious diseases: fevers.
   2. Acute and chronic intoxications: alcohol, tobacco, lead poisoning, etc.
   3. Constitutional disorders: endocrines, anemias, etc.

The real purpose of this discussion is to focus critical attention on the diagnosis of sinus headache. Problems of diagnosis are confined chiefly to the chronic types of headache. The "independent forms" are the most common of these chronic types. These will be discussed somewhat in detail.

Migraine

Migraine, more commonly known as "sick headache," is characterized by periodic paroxysms of intense pain preceded or accompanied by characteristic sensory or motor disturbances or their combination along with general vasomotor or psychic phenomena. The most frequent beginning site is in the neighborhood of an eye, either above, lateral or deep. There is a tendency of the pain to become diffuse and involve the whole side of the head or become generalized. The patient may describe the pain as dull, boring, pressing, throbbing, hammering, vise-like or shooting. The pain tends to gradually increase to an intense height.

The duration of the headache is variable. It usually lasts more than a day, often for several days. "Abortive" attacks may last two or three hours. An attack may appear at any time of day and even awaken the patient at night.

The patient may have a foreboding—an aura of the impending headache; this is really part of the attack.

Gastro-intestinal symptoms usually present are nausea and vomiting. Complete anorexia during the headache and abdominal pains are not infrequent and the patient is usually constipated.

Throughout an attack the patient often exhibits a general hypersensitiveness. He is irritable, though mentally slow, complains of photophobia and abhors noise.

Certain signs referable to the cervical sympathetic function may be noted, such as pallor and hyperidrosis of one side of the face, and one pupil smaller than the other with absence of normal reaction. There may also be evidence of general sympathetic dysfunction, such as bradycardia, generalized perspiration, urinary frequency and pyrexia in children.

The cause of migraine is unknown. Among the theories advanced are that it is a reflex phenomenon, a toxic metabolic disorder, that it results from mechanical obstructions to the central ventricular system, or that it is a vasomotor disturbance. The last mentioned theory seems to have the most support.

A variety of conditions seem to have a role in precipitating attacks, such as mental and emotional excitement, fatigue, dietary indiscretions, in women the menstrual relationship, etc.

There seems to be a hereditary factor, over 50 per cent giving a history indicating a direct homologous heredity.

The incidence of migraine is difficult to estimate. Puberty is the most frequent time of onset. Relatively few develop migraine after 40 years. The condition is more than twice as common in females as in males.

The patient is symptomless between attacks. The course is lengthy and may continue in the same form for years, although the character of the attack may change. The frequency and severity of an attack may be altered in either direction. Natural menopause may be accompanied by a cessation of the attacks.

The treatment consists of avoiding the factors which seem to precipitate attacks. The most effective medication in alleviating an attack is ergotamine tartrate.

A localized form of migraine referred to as the ophthalmic form occurs in which the prodromata and early symptoms are referable to the visual system. Scotomata and homonymous hemianopsia characterize this form. A rare ophthalmoplegic migraine has been described in which the function of the third nerve is impaired.

Nervous and Mental States

The incidence of headache which is designated as neurasthenic or psychogenic is apparently very great. When evidence is lacking to ascribe the headache to any specific cause, the usual conclusion is that the disturbance rests on a neurasthenic or psychogenic basis. Diagnosis is made primarily on a careful history and secondarily on the absence of reasonable factors discernible to objective examination.

In the majority of cases of this form of headache, there is no actual pain, but an oppression, constriction, or heaviness of the head. This may occur in a healthy individual who temporarily suffers from over-exertion or exhaustion, particularly mental. Usually, however, the patient gives a history of considerable nervousness and chronic fatigue.

The sensations are usually situated in or behind the forehead and extend down into the eyes and root of the nose. Less frequently, the temples are involved. The sensation may also be likened to an elastic band encircling the head. The patient frequently refers to a sensation of the head feeling hollow or empty. Some describe paresthesias of the temples and forehead. Occasionally the pain may assume a neuralgic character.

This form of headache has no periodicity. It tends to be more or less constant. Many patients have vague general complaints which, in their analysis and from a physical study of the individual, suggest hypochondria.

One explanation of the mechanism of these headaches suggests that fatigue toxins affect the nerves supplying the dura. A more widely accepted and more rational opinion is that this form of headache is a vasomotor disturbance leading to an active hyperemia in the arteries and a passive congestion in the veins of the brain or its coverings.

Posterior Neck Conditions

A number of causes for headache have been found in the posterior neck. Auerbach described a clinical entity under the title of nodular (induration) headache. Small palpable tender nodular or indurated areas occurred in the occipital muscles or fascia of the neck. These caused an occipital ache which remained localized or spread up over the temples. Exposure to cold and chilling precipitated the pain. The nodular or indurated area consisted of a localized muscle spasm causing irritation of sensory nerve endings in the area involved. Treatment with local application of heat, the use of anti-neuralgics, and supplementary massage invariably brought relief.

Occipital headache has been described as due to myalgia, fibrositis, hypertonic neck muscles, and arthritis of the cervical spine. There is a marked similarity in the etiology, age group, manifestations and treatment.

The chief precipitating factor seems to be exposure to cold. The symptoms are aggravated by fatigue and tight-fitting apparel such as a hat, cap, or collar. The discomfort is usually unilateral and consists of a dull but definite ache which is aggravated by movements of the head and neck. When sought for, tender spots are found on careful palpation over the superior nuchal line, the trapezius, splenius and scalenus muscles, the sternocleidomastoid and its fibrous attachment to the mastoid tip. If areas of myositis or localized muscle spasm exist, these will be definitely palpable as thickening or nodules. The fibrositic areas may be palpable, but, in an arthritis of the cervical spine, objective evidence is usually lacking except to X-ray examination.

Areas of myositis or induration have been found in the frontalis muscle causing headache at this site.

The treatment has in part been referred to in the use of heat, anti-neuralgics and massage. Obviously, massage would not reasonably aid a cervical arthritis. The search for and eradication of toxic foci, avoidance of chilling and fatigue, and the administration of foreign proteins are recommended.

These conditions are uncommon in children and are usually found in a middle age group.

"Erythromelalgia" of the Head

A clinical entity has been described recently by Horton, MacLean, and Craig, for which the name "erythromelalgia of the head" has been suggested.

> "The pain of which the patients complained was limited to one side of the head. It was a constant, excruciating, burning, boring, type of pain which involved the eye, the temple, the neck, and often the face. It had none of the tic-like qualities of trigeminal neuralgia, and there were no trigger zones. There was frequently marked tenderness on pressure over the branches of the external carotid and common carotid arteries."

The pain might appear or disappear suddenly, last a few minutes to a few hours and even occur at the same hour of day or night for weeks.

Vasodilation on the same side of the head as the pain invariably was coincident with the onset of the pain. There resulted swelling of the temporal vessels, engorgement of the soft tissues of the eye, injection of the conjunctiva, plugging of the nose, profuse watering of the eye and nose, and flushing of the side of the face. All of these phenomena were not present in every case.

Partial relief or abortion of an attack of pain was obtained in a number of patients by the use of salicylates. Abstinence from alcohol, the use of which produced exacerbations, offered some relief.

The fact that the attacks of pain were associated with the phenomenon of vasodilatation suggested experimenting with histamine. Subcutaneous doses of 0.3 to 0.5 mgm. produced the typical syndrome of headache. Intravenous use of vasoconstricting substances controlled the attacks. Patients were unable to differentiate between induced and spontaneous attacks and immediately after a severe spontaneous attack the 1 mgm. of histamine administered subcutaneously failed to produce a flushing of the face.

The patients were then desensitized to histamine by giving subcutaneously .05 mgm. of histamine twice each day for two consecutive days, increasing the dose to .066 mgm. twice daily on the third day and to 0.1 mgm. twice daily by the fifth day. This dose was then continued twice daily for two to three weeks. Definite relief was obtained in over three-fourths of the patients. Several who had recurrences were relieved by another course of histamine.

Headache Associated with Disease of Individual Organs

The Brain. The diagnosis of brain disease on the basis of the single symptom of headache alone is practically never made.

The symptom is too variable. Associated with other symptoms or signs, however, the symptom of headache may become of major importance in differential diagnosis. When the brain condition is the sequelae of an infection, such as in brain abscess, meningitis, encephalitis, etc., invariably there are preceding events or accompanying manifestations to focus one's attention on these possibilities. In brain tumor, the first symptom may be headache; but yet there are said to be no characteristics by which this single symptom makes the diagnosis. Generalizing, one may say that the pain tends to be continuous, is worse on exertion such as sneezing, coughing and straining, seems to be referred to the interior of the skull, and there may be a sense as if the cranium was about to burst. Tilney has stated that headaches due to brain tumors tend to come in the early part of the day and diminish in severity toward evening, but he adds that all the accepted traditions and teaching about this type of pain have been contradicted time and again in actual experience.

Headache in cerebral arteriosclerotics is common and is generally manifest as an oppression localized to the forehead. It may be difficult to differentiate from the aches of the neurasthenia. It may become severe. It is reasonable to assume that the mechanism of this headache is on a vasomotor basis inasmuch as there has been a disturbance in control of the regulating vasomotor apparatus over the inelastic vessel walls. These headaches are aggravated by exertion, both physical and mental. Relief is often obtained by rest. Cold compresses seem to lessen the arteriosclerotic headache.

Circulatory disturbances associated with heart or lung disease may cause a protracted headache described as a heavy pressure and affecting the entire head. The mechanism suggests itself as a vasomotor disturbance resulting from a passive hyperemia of the brain.

Headache associated with epilepsy offers no problems of diagnosis.

Traumatic headache as a diagnosis, except for the history of trauma, may need to rest on subjective evidence supported by exclusion of the other causes.

Eyes. Headache from ocular disturbance is due to one or more of four conditions: refractive error, muscular imbalance, intraocular inflammation, and pathological tension. Invariably attention is directed to the eyes by a history of the discomfort coming on after use of the eyes in the acts of accommodation or the fact that the discomfort is actually within the eye. Usually this discomfort is not a unilateral one except in cases of localized disease as in an inflammatory process in or a pathological tension of one eye. The headache from refractive errors is invariably frontal; that from muscle imbalance may be occipital. The mechanism of ocular headache is not a direct reflex neurological phenomenon but is probably the result of vasomotor disturbance centered in the orbit.

The Nasal Space. It is the headache arising from the nasal space with which this discussion is primarily concerned.

Information concerning sinusitis (and much of it is misinformation) has become so widespread that the layman and a share of the medical profession are very apt to think in terms of the sinuses in all problems of headache, acute or chronic. This perhaps should not seem strange inasmuch as of all the situations equipped with a unitary neural mechanism for the production of pain, the nasal space, fifth nerve and dura mater relationship suggest the most obvious explanation. However, clinical experience has taught us contradictions. My observations lead me to believe that there are three possibilities for the production of pain within the nasal space. It may originate (1) through congestion or contacts within the nasal fossa; (2) because of inflammation or congestion within a sinus, and (3) from irritation of the sphenopalatine ganglion or its roots.

Congestion or contact within the nasal fossa is a common cause of a dull type of temporary headache or pain usually unilateral and located at the root of the nose and between this spot and the corresponding eye, sometimes deep and often within the supraorbital area. The cause will be found in an irregularity of the nasal septum and a swollen middle turbinate causing pressure on both the septum and the lateral nasal wall. Simple shrinkage, as from ephedrine, will often relieve the pain; anesthetization with cocaine at the site of the contact offers certain relief. Permanent relief may require correction of the offending septum and, if the anterior end of the middle turbinate has undergone degenerative change, a portion of this may have to be removed.

A special form of contact or congestive headache was described by Sluder as due to a vacuum in the frontal sinus. The theory was that air was absorbed from the sinus after the nasofrontal duct has become swollen shut. This produced a negative pressure in the sinus and a resultant hyperemia of the sinus lining. The acts of accommodation causing traction on the pulley of the superior oblique muscle which is attached to the thin portion of the frontal sinus floor was considered to be the cause of the pain. Some rhinologists deny that this condition can actually develop. I have observed a headache with the same characteristics and signs in patients in whom the frontal sinus was absent on the side of the pain. Therefore, I prefer to classify this type of headache as a contact or congestive type.

Headache caused by inflammation within a sinus requires that there be present an inflammatory swelling or empyema causing tension. This occurrence has invariably been preceded by an upper respiratory tract infection; there are usually objective findings of swelling and significant secretion on examining the nose; and the location and characteristics of the discomfort point toward the sinus or sinuses involved. Pain from an acute empyema of the antrum is manifest in a face ache, often tenderness or pain in an upper tooth or teeth, particularly the molars of the involved side, and a headache above the corresponding eye. This ache above the eye is misleading and directs attention to the corresponding frontal sinus which may be normal. The mechanics of production of supra-orbital pain from inflammation in the antrum must be from reflex neuralgia from the second division of the fifth nerve to its first division or because of the fact that inflammation has spread to the anterior ethmoid area and the pain is produced through the nasal branches of the first division.

Headache from acute ethmoid sinusitis is characteristically deep or superficial between the orbit and nasal space and in the temporal area. Acute frontal sinus pain is localized to the area of the sinus. Sphenoid pain is deeply between the eyes or in the occiput or expressed through Vidian or Sphenopalatine neuralgia.

There usually is no problem of diagnosis of the cause of headache when it occurs in an acute sinusitis, and invariably when drainage is established through rest, simple shrinkage of the nasal lining, and the local application of heat, the ache disappears. Pain from sinusitis has been said often to have a certain characteristic occurrence, coming on in the middle of the forenoon, worse in the middle of the day, and spontaneously disappearing or improving in the late afternoon or evening.

Neuralgias from nasal pathology are relatively uncommon. It is doubtful that the classical Tic Douloureux is ever caused by sinus disease. Some writers list sinus disease as one of the possible causes—others deny this factor. I said earlier in this discussion that the third source of pain production from nasal pathology is through the Sphenopalatine ganglion. This is also called the nasal ganglion—in the older anatomic terminology it was known as Meckel's ganglion. In 1920 Sluder wrote a book entitled *Headache and Eye Disorders of Nasal Origin*, and popularized a syndrome of sphenopalatine ganglion neurosis. The neuralgic aspects of this syndrome were described as pain of variable intensity beginning at the root of the nose in and about the eye, in the upper jaw and teeth, along the zygoma emphasized at the mastoid, in the occiput, neck and shoulder of the corresponding side. In severe cases the pain was said to extend into the axilla and even down the arm to the finger tips.

I have never encountered such wide distribution of pain which I could convince myself came from irritation of the Sphenopalatine ganglion. Others have critically reviewed Sluder's work and considerable controversy has resulted. Most rhinologists agree, however, that there is a type of neuralgia which is caused by pathology in the posterior part of the nose either in the posterior ethmoid cells, the sphenoid sinus, or both, and affecting the Sphenopalatine ganglion or its posterior root, the Vidian nerve. This form of neuralgia is characterized by the onset of a severe pain localized around and back of the eyeball, radiating to the temple, ear, back of head, neck and even the shoulder, usually unilateral and often nocturnal.

This pain may be controlled by placing an applicator with a 10 per cent solution of cocaine to the Sphenopalatine area or by putting a few drops of the solution into the sphenoid sinus. One method or the other will always control the pain.

The Teeth. There are numerous references in the literature regarding the teeth as a source of headache but I have not found any specific case reports or explanation of the mechanism by which this headache is produced, except in the group in "posterior neck conditions." Presumably, infection of a dental root could cause a headache by one of two methods, a direct irritation of the nerve supplying the tooth or teeth involved, or through the effect of toxic absorption. In my own experience, the head pain caused by dental conditions has all been of a localized neuralgic type over the upper or lower jaw or referred to the ear of the involved side.

The Digestive Tract. Headache from digestive tract disturbances is apparently very common. A wide variety of conditions might cause it, such as an idiosyncrasy to certain foods, any derangement of gastric or intestinal function, the mechanical and possibly toxic effects of constipation, etc. The mechanism in most cases is probably a vasomotor one, although it has long been considered as a toxic influence on the dural nerve endings. Constipation is believed to be a frequent cause of headache.

Other Individual Organs. The other individual organs which must be thought of when the symptom of headache is present are the kidneys, and the organs of the pelvis in the female. Headache from kidney disturbance is undoubtedly the result of a toxic factor or the effect of edema. The pelvic disturbances in the female which might cause headache are the inflammatory conditions, and the local vasomotor disturbances incident to menstruation or pregnancy. Ovarian disturbance as a cause of headache is classified under endocrine disorders.

Headache in General Disease

In the acute infectious diseases, headache is a symptom as a rule only during the toxic stage, which often disappears with the fever. One of the common examples of this type of headache occurs with influenza. The otolaryngologist is often consulted to rule out the sinuses as a cause of a continuous, moderately severe, frontal headache. The sinuses may be negative to X-ray or show a minimal amount of pathology. The nasal membrane is mildly injected, slightly edematous and wet. Shrinkage of the nasal mucosa and the local application of heat brings no relief in the headache. It gradually subsides in intensity and ceases. There is no clinical evidence to support a diagnosis of sinusitis as a cause of the headache.

Headache from acute and chronic intoxications may be caused by alcohol, tobacco, lead poisoning, carbon monoxide poisoning, etc. The mechanism of production of the discomfort could be on the basis of a toxic neuritis or a vasomotor reaction. In the case of carbon monoxide poisoning, it would undoubtedly be a vasomotor state due to an anoxemia. This anoxemia results in a hyperemia of the cerebral vessels.

The constitutional conditions which cause headaches are the endocrine disorders and the anemias. Diabetes mellitus is a common example of an endocrine disorder. Headache and neuritis are common in this disease. The mechanism may be a directly toxic one or on a vasomotor basis. The anemias produce headache apparently as a result of an anoxemia which results in a hyperemic cerebral state.

Summary

Clinical observations and research on the mechanism of headache indicate that this symptom is commonly caused by vasomotor phenomena.

The causes of headache are many. The nasal space is often accepted as a cause of headache because nasal symptoms, such as congestion and discharge are extremely common, and objective evidence of an irregularity of the nasal septum or X-ray signs of abnormality within a sinus are frequently found. In acute nasal conditions, the relationship is frequent and the diagnosis is readily made. In chronic headache, sinusitis is not a common cause. A careful evaluation of the history will often reveal a relationship to other disorders such as migraine, nervous conditions, disturbances in the posterior neck, disease of individual organs or certain general diseases.

ERNEST R. ANDERSON, M.D., *Secretary.*

Future Meetings

The South Dakota Society of Medical Technologists will hold their annual meeting at Vermillion, South Dakota, September 2 and 3. The meeting will be largely devoted to a seminar of blood studies conducted by Dr. W. R. Giedt, assistant professor of pathology of the School of Medical Sciences of the University of South Dakota.

Minnesota will be host to the 27th annual meeting of the Mississippi Valley Conference on Tuberculosis and the Mississippi Valley Sanatorium Association, which will meet at the Lowry Hotel in St. Paul, October 2, 3 and 4.

Governor Harold E. Stassen will be the principal speaker at the dinner meeting on Thursday, October 3. His subject will be: "Social and Economic Problems in the Decade Ahead." Dr. Everett K. Keer, first vice-president of the Ramsey County Public Health Association, will give the address of welcome.

The Mississippi Valley Conference on Tuberculosis is composed of local and state Christmas Seal organizations of the following states: Illinois, Indiana, Kansas, Michigan, Minnesota, Iowa, Missouri, Nebraska, North Dakota, Ohio, South Dakota and Wisconsin.

Minnesota medical members of the governing council of the conference are: Drs. Lewis S. Jordan, Granite Falls; Walter J. Marcley, Duluth; E. S. Mariette, Oak Terrace; E. A. Meyerding, St. Paul, and J. A. Myers, Minneapolis.

The annual meeting of the Minnesota Public Health Association, one of the affiliated organizations, will be held Thursday noon, October 3.

An interesting feature of the scientific exhibits will be the Leitz projector, which enlarges an X-ray film to full motion picture screen size. The projector is the only one of its kind in the United States. A special X-ray conference is scheduled for Friday night under the direction of Dr. John H. Skavlem of Cincinnati, Ohio.

Speakers at a College Hygiene luncheon scheduled for Friday noon include the following physicians: Drs. Ruth E. Boynton of Minneapolis, president of the American Student Health Association; J. A. Myers, professor of preventive medicine, University of Minnesota; Charles E. Lyght, Northfield, chairman of the Tuberculosis committee, American Student Health Association. Dr. Paul A. Teschner, assistant director, Bureau of Health Education, American Medical Association, Chicago, Illinois, will preside at a panel Friday afternoon, October 4, on Nursing Problems in a Sanatorium. Physicians taking part in the panel are: Drs. M. H. Draper, secretary and medical director, Irene Byron Sanatorium, Fort Wayne, Indiana; J. Vincent Sherwood, superintendent and medical director, South Dakota State Sanatorium, Sanator, South Dakota, and John W. Towey, superintendent and medical director, Pinecrest Sanatorium, Powers, Michigan.

News Items

Dr. A. Kositsky, formerly of Granville, North Dakota, is now practicing in Leola, South Dakota.

Dr. J. M. Graybeal, of Missoula, Montana, is now at Marion, Virginia, where he is associated with his brother in medical practice.

Dr. J. G. Carney has left Sioux Falls and is now practicing in Fort Pierre, South Dakota.

Dr. Orin P. Thorson, of Northfield, Minnesota, has joined a clinic at Bremerton, Washington. He had practiced in Northfield for 12 years. Dr. Robert E. Mears of St. Paul is succeeding Dr. Thorson.

Dr. J. A. Muggly, Madison, South Dakota, has been elected president of the Madison Community Hospital. Dr. R. S. Westaby, retiring president, is the new secretary and Dr. D. S. Baughman, treasurer.

Dr. Julian Dubois, Sauk Center, was elected president of the Northern Minnesota Medical Association at the annual meeting held in Duluth, July 20. He succeeds Dr. Owen W. Parker of Ely.

Dr. Henry E. Michelson of Minneapolis, when returning from lecturing before the Upper Mississippi Medical Meeting, held at Cass Lake, August 10, 1940, was run into by a reckless driver being pursued by the highway patrolmen. He suffered minor injuries and will be able to resume work soon.

Dr. F. L. Smith, Rochester, has been appointed chairman for Minnesota of the American Medical Association committee on medical preparedness.

Dr. C. H. Sherman, formerly affiliated with Dr. E. V. Strand of Bayport, has opened offices in Stillwater, Minnesota.

Dr. C. A. Kelly of Hibbing is now associated with Dr. Rowles in the Rood Hospital at Coleraine, Minnesota. Dr. Kelly recently completed his internship at St. Mary's Hospital, Duluth.

Dr. N. F. Musachio, formerly of Milaca, has taken over the office of the late Dr. G. A. Holdridge at Foley, Minnesota.

Dr. L. L. Kallestad, formerly of Minneapolis, has joined the Cokato hospital staff in Cokato, Minnesota.

Dr. Maysil M. Williams, North Dakota state health officer, lectured during the summer session at the University of Minnesota on maternal and child health problems.

Pre-school health conferences for mothers and their children of pre-school age were held in Devils Lake, North Dakota, and in other towns of Ramsey county August 10 to 23.

South Dakota physicians and their wives from Madison, Sioux Falls, Lake Preston, Brookings, Volga, Wentworth, Chester, Carthage and Howard held their annual summer meeting of the Madison district medical society and auxiliary August 1, in Madison, South Dakota.

Succeeding Dr. Edward Bollinger who has returned to Columbia, Illinois, Dr. Herbert J. Lipson has assumed his duties on the medical staff of the Grafton State School, Grafton, North Dakota.

Dr. R. G. Barnes, Jr., of Duluth, Minnesota, is now associated with Dr. R. C. Radabaugh in Hastings. Dr. Barnes, who was graduated from the University of Minnesota, was recently of Hackensack, New Jersey.

The Woman's Auxiliary to the South Dakota State Medical Association held its annual meeting in Watertown, May 20 to 22, 1940, at which time the Auxiliary celebrated its thirtieth anniversary with a complete history and scrapbook record given by Mrs. C. E. Sherwood, state historian, of Madison. The matter of a Benevolent Fund was discussed by Mrs. F. C. Nilsson. A nucleus for such a fund was inaugurated last year and the fund has continued to grow. The following officers were elected for the ensuing year: Mrs. R. A. Buchanan, Huron, president; Mrs. F. C. Nilsson, Sioux Falls, president-elect; Mrs. G. H. Gulbrandson, Brookings, first vice-president; Mrs. B. M. Hart, Onida, second vice-president; Mrs. J. C. Hagin, Miller, recording secretary; Mrs. J. C. Shirley, Huron, corresponding secretary and treasurer.

The third annual Essay Contest of the Mississippi Valley Medical Society "for the best unpublished essay on a subject of practical and applicable value to the general practitioner of medicine" has been concluded. The Annual Awards Committee of the Society has announced that John F. Casey, M.D., of Boston, Massachusetts, visiting physician, St. Elizabeth's Hospital, Boston, is the winner, F. Stanley Morest, M.D., of Kansas City, Missouri, second, and Charles W. Pavey, M.D., of Columbus, Ohio, third. The winner receives a $100.00 cash prize, a gold medal, a certificate award, and an invitation to present his essay before the annual meeting of the Mississippi Valley Medical Society.

Necrology

Dr. Alex M. Macaulay, 63, Great Falls, Montana, died July 23, 1940. He had practiced in Great Falls for 28 years.

Dr. William H. Carroll, 31, resident physician at Glen Lake Sanatorium, died August 7, 1940. Dr. Carroll was graduated from the University of Minnesota medical school in 1932 and interned at University hospitals during 1933-34.

Dr. Lyle E. Haverfield, 44, of Hardin, Montana, died July 29, 1940.

Dr. Franklin Randolph Wright, 74, Minneapolis urologist, died August 1, 1940. Dr. Wright had been a member of the university faculty 41 years at the time of his retirement in June, 1936, when he was accorded the rank of associate professor emeritus of urology.

Dr. Earl H. Marcum, 62, Bemidji, Minnesota, died August 5, 1940. He had practiced in Bemidji since 1903.

LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS ON MAY 10, 1940

APRIL EXAMINATION

Name	School	Address
Bailey, Robert Burr	U. of Minn., M.B. 1940	Fairmont, Minn.
Baldigo, Edward Micheal	U. of Minn., M.B. 1939	Miller Hospital, St. Paul, Minn.
Beard, Crowell	U. of Cal., M.D. 1939	Mayo Clinic, Rochester, Minn.
Benson, Raymond Emanuel	U. of Ill., M.D. 1939	Mayo Clinic, Rochester, Minn.
Christensen, Burt H.	Johns Hopkins, M.D. 1938	Mayo Clinic, Rochester, Minn.
Currens, James Hawley	Duke U., M.D. 1938	Mayo Clinic, Rochester, Minn.
Dippel, Adelbert Louis	U. of Texas, M.D. 1928	University Hospital, Minneapolis, Minn.
Downing, Arthur Herrmann	U. of Chicago, M.D. 1939	Ancker Hospital, St. Paul, Minn.
Emmens, Thomas Holmes	U. of Ore., M.D. 1939	Ancker Hospital, St. Paul, Minn.
Ersfeld, Murray Peter	U. of Minn., M.B. 1939, M.D. 1940	Wm. J. Seymour Hospital, Eloise, Mich.
Frane, Donald Bernard	U. of Minn., M.B. 1937, M.D. 1938	1429 Laramie, Manhattan, Kansas.
French, Lyle Albert	U. of Minn., M.B. 1939	University Hospital, Minneapolis, Minn.
Grove, Raymond Fisk	Northwestern, M.B. 1938, M.D. 1939	Ancker Hospital, St. Paul, Minn.
Haigler, Samuel Hartley	Tulane U., M.D. 1937	Mayo Clinic, Rochester, Minn.
Klinkenberg, Royle B.	U. of Kansas, M.D. 1938	Mayo Clinic, Rochester, Minn.
Krueger, Victor Robert	U. of Wis., M.D. 1939	St. Luke's Hospital, Duluth, Minn.
Kuris, David B.	U. of Minn., M.B. 1939	St. Luke's Hospital, Duluth, Minn.
Lake, Clifford Franklin	Northwestern, M.B. 1938, M.D. 1939	Mayo Clinic, Rochester, Minn.
Loucks, Joseph Anthony	U. of Minn., M.B. 1939	Miller Hospital, St. Paul, Minn.
Low, John Edward	U. of Minn., M.B. 1939	Ancker Hospital, St. Paul, Minn.
Lueck, Arthur George	Northwestern, M.B. 1937, M.D. 1938	Mayo Clinic, Rochester, Minn.
McFarland, Corley B.	Northwestern, M.B. 1939	Ancker Hospital, St. Paul, Minn.
Mead, Franklin Braidwood	Northwestern, M.B. 1937, M.D. 1938	Mayo Clinic, Rochester, Minn.
Miller, Joseph Matthew	Columbia U., M.D. 1935	Mayo Clinic, Rochester, Minn.
Minckler, John Everett	U. of Minn., M.B. 1939	Ancker Hospital, St. Paul, Minn.
Minge, Raymond Kenneth	U. of Minn., M.B. 1938, M.D. 1939	University Hospital, Minneapolis, Minn.
Mitchell, Harriet Jean	Johns Hopkins, M.D. 1938	515 Delaware St. S. E., Minneapolis, Minn.
Murlin, William Raymond	U. of Rochester, M.D. 1938	University Hospital, Minneapolis, Minn.
Nelson, Lawrence Meier	U. of Neb., M.D. 1937	Mpls. General Hospital, Minneapolis, Minn.
Nielsen, Alvin Martin	U. of Minn., M.B. 1939	St. Joseph's Hospital, St. Paul, Minn.
Nietfeld, Aloys Bernard	U. of Minn., M.D. 1939	St. Mary's Hospital, Minneapolis, Minn.
Palmerton, Ernest Sterling	U. of Minn., M.B. 1938, M.D. 1939	General Hospital, Kansas City, Mo.
Peterson, Donald Herbert	U. of Minn., M.B. 1939	Bethesda Hospital, St. Paul, Minn.
Polmeteer, Frank Edward	U. of Iowa, M.D. 1936	Mayo Clinic, Rochester, Minn.
Root, Grosvenor Thomas	U. of Mich., M.D. 1937	Mayo Clinic, Rochester, Minn.
Shima, George Joseph	Creighton, M.D. 1939	St. Joseph's Hospital, St. Paul, Minn.
Smiley, John Thomas	Northwestern, M.B. 1939	Ancker Hospital, St. Paul, Minn.
Standard, William Perry	Northwestern, M.B. 1937, M.D. 1938	Mayo Clinic, Rochester, Minn.
Stover, Lee	Rush Med. Col., M.D. 1938	Mayo Clinic, Rochester, Minn.
Thompson, Carl Oliver	U. of Minn., M.B. 1938, M.D. 1939	University Hospital, Minneapolis, Minn.
Tostenson, Norman E.	U. of Minn., M.B. 1940	808 Wash. Ave. S. E., Minneapolis, Minn.
Warne, Merna Mary	U. of Wis., M.D. 1938	2215 Glenwood Ave., Minneapolis, Minn.
Wilson, James Webster	McGill U., M.D. 1937	Mayo Clinic, Rochester, Minn.
Wyrens, Rollin Gerald	Northwestern, M.B. 1937, M.D. 1938	Mayo Clinic, Rochester, Minn.

BY RECIPROCITY

Dricken, Hilbert Nickolas	Marquette, M.D. 1935	617 N. 23rd St., Milwaukee, Wis.
Goldner, Meyer Zachary	U. of Neb., M.D. 1935	1127 Med. Arts Bldg., Minneapolis, Minn.
Milhaupt, Emmett Norbert	U. of Wis., M.D. 1935	University Hospital, Minneapolis, Minn.
Stevenson, Walter Davis, Jr.	Wash. U., M.D. 1937	Mayo Clinic, Rochester, Minn.

NATIONAL BOARD CREDENTIALS

Booth, Marguerite	Yale U., M.D. 1935	University Hospital, Minneapolis, Minn.
Gray, Robert F.	Northwestern, M.B. 1938, M.D. 1939	Marshall, Minn.
Minty, Earl Walter	Northwestern, M.B. 1932, M.D. 1933	305 Security Bank Bldg., Faribault, Minn.
Rogers, Arthur Merriam	Cornell U., M.D. 1937	Mayo Clinic, Rochester, Minn.

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Preventive Allergy in Infancy and Childhood*

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Minneapolis, Minnesota

THE subject of allergy has assumed such an increasing proportion of the field of medicine in the past few years that it is incumbent upon every physician to be familiar with its principles. Allergy may be defined as a natural sensitiveness of the human organism to a chemical (or physical) substance which is harmless to most persons. Thus, the vast majority of us eat eggs and enjoy them, but to an occasional person such a food may result in eczema, urticaria or asthma. Most of us inhale the pollen of various trees, grasses, or weeds and are not aware of it; a few react by manifesting hay fever or asthma. We say that these people are allergic on account of their reaction in an abnormal way to something which is non-toxic to most of us.

The importance of acquaintance with the field of allergy is based upon several considerations. In the first place the symptoms of allergic reaction may occur in almost any part of the body and it may thus be of importance to every doctor no matter what his specialty is or wherein his interest lies. Depending on the location of the reaction we may have eczema, urticaria, allergic coryza, hay fever, bronchial asthma, gastro-intestinal allergy, migraine or vernal conjunctivitis.

Not only are the allergic diseases or symptoms quite variable but the prevalence of such conditions is fairly high. It may be conservatively said that there are in this country alone five million hay fever sufferers, and between three and four million asthma cases. Three million people have migraine and approximately two million individuals suffer with allergic skin diseases. With the addition of other allergic diseases we may readily see that there is a vast army of allergic patients awaiting our increasing interest in them. It is true that the mortality from allergy is very small. Yet the inconvenience and discomfort, the economic loss of time from school or work, the disabling effect in many cases, particularly the asthmatics, and the complications that are apt to follow, all make the allergic diseases as a whole a very important group and well deserving of our study and interest.

What is the cause of allergy? The fundamental difference between the allergic and non-allergic individual is not known. In the causation of allergic disease three factors, however, must be considered, each of which plays a definite role. They are the constitutional, primary, and secondary causes. The most certain knowledge we have concerning this constitution is that it is usually inherited. It has been stated that by the tenth year of life allergic symptoms have appeared in 89 per cent of the offsprings under a bilateral hereditary influence, in 35 per cent of those subject to a unilateral influence, and in only 20 per cent of those with a negative allergic history in immediate members of the family. The greater the hereditary the earlier are symptoms manifested, and the earlier in life the individual becomes sensitive the greater the tendency to multiple sensitization.

It should be stated that it is the allergic tendency that is inherited and not the allergic disease. Thus, a grand-

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parent may have asthma, the parent hay fever, and the grandchild eczema. One may be sensitive to house dust, the next to a weed pollen, and the child to milk. All these individuals of the same family have a common characteristic, the ability to become sensitized and to react in an abnormal way.

The constitutional factor alone cannot be responsible for allergic symptoms. It is important that the allergic subject become sensitized to a particular substance. Once sensitive it is necessary for him to be again exposed to that substance before an attack occurs. These substances referred to as excitants, allergens, or atopens are usually protein in nature but not necessarily so. Drugs may be responsible. The patient may be exposed to the substance to which he is sensitive and still fail in some instances to react. This may be due to the fact that the dose of the ingested or inhaled allergen is below that particular individual's tolerance. A larger dose may produce an allergic attack. The tolerance of a subject varies from time to time depending on the general health of the individual, and also on secondary or precipitating causes such as cold, heat, wind, or a sudden change in the weather.

What is the present-day treatment of allergic diseases? For many years these diseases have been treated with various forms of medications and in some instances surgery has been used. Now every effort is made to find the sensitizing agent or agents. Often, however, the patient comes to the doctor after many years of trouble. The allergic disease has become more or less a fixed condition. The physician is not able to offer much help unless he receives complete coöperation from the patient. This is the difficult feature of the treatment of today.

First, must be considered the fact that difficulties will arise in the handling of the allergic patient unless the most common excitants, allergens or atopens are known and their relative value is understood. For the sake of economy and simplicity, the most essential substances are therefore listed below in the order of their importance. The only exception appears under the pollens. They are grouped in the order of their pollination:

I. Inhalants

A. *Pollens*

1. Maple (Aceraceae)—Boxelder and soft maple—April.
2. Birch (Betulaceae)—Paper birch, common hazel and ironwood—April, May.
3. Cottonwood (Salicaeae)—Cottonwood, aspen, balsam poplar and willow—April.
4. Elm (Urticeae)—American and slippery elm, hemp mulberry and nettle—April.
5. Bulrush (Cyperaeae)—Great bulrush, long-beaked sedge and tussok—April, May, June, July.
6. Ash (Oleaceae)—Green and black ash—April, May.
7. Oak (Flagaceae)—Burr, Hill's, red and white oak—May.
8. Grasses (Gramineae)—June, timothy, brome, quack, sorghum, corn, barnyard, goose and sweet vernal grasses May, June, July.
9. Walnut (Juglandaceae)—Butternut, black walnut, shellbark and butternut hickory—May.
10. Plantain (Plantaginaceae)—Common plantain and ribgrass—June.
11. Dock-Sorrel (Polygonaceae)—Sheepsorrel, curled dock and pale dock—June.
12. Alfalfa-Clover (Leguminosae) — Alfalfa and sweetclover—June, July.
13. Pigweed (Amaranthaceae)—Redroot, tumbleweed and green amaranth—July, August.
14. Russian Thistle—(Chenopodiaceae)—Lambs quarters, Russian thistle, burning bush, maple-leaved goosefoot—July, August.
15. Wormwood-Sage (Compositae)—Dragon sage, prairie sage, mugwort, pasture sage—August, September.
16. Ragweed (Ambrosiaceae)—Common, giant and western ragweed, marsh elder and cocklebur—August, September.

B. *Animal Danders*

1. Horse Dander—Of the animal epithelia, that of the horse is undoubtedly one of the most frequent causes of hypersensitiveness in humans. Horse dander is a very potent atopen but horse hair is relatively weak.
2. Cat Epithelium—The cat is a more frequent cause of hypersensitiveness than any other household pet. Cat epithelium reactions are about twice as common as dog. Cat hair is used to cover many toy animals.
3. Dog Epithelium—It has been said that sensitivity may exist to the emanations from one breed of dogs and not to those from others.
4. Feathers: Chicken, Duck and Goose Epithelium—Feather sensitivity is frequent among those classes of patients who are accustomed to use large pillows and feather beds, especially when these are stuffed with unsterilized feathers.
5. Goat Epithelium—Goat dander does not seem to be as powerful an atopen as some of the other danders already noted but the use of goat hair in industries has increased its significance as an atopen. Mohair is the fine wooly hair of the goat.
6. Cow Epithelium — Cutaneous reactions to cow epithelium are rather common. Atopic individuals also tend to become sensitive to several products of the same animal. Hence, the frequent association to positive reactions to horse epithelium and horse serum; to feathers, chicken meat and egg; to cow epithelium, cow serum and beef. Rug pads contain a large amount of cow hair.
7. Hog Hair—Allergic reactions to it are unquestionably more frequent in the rural than in urban districts. Hog hair brushes may cause allergic reactions.
8. Rabbit Epithelium—Because of the high incidence of rabbit hair products in the industries, the substance is of great importance as an atopen in this country. For some unknown reason it is a more common offender among children than among adults. Rabbit hair is used in stuffed furniture.
9. Sheep Wool—Considering the wide use of wool in industry, sensitivity to it occurs in a relatively small percentage of atopic individuals. In the form of woolen cloth it ranks equal to that of silk as far as a contact atopen is concerned.
10. Camel Hair—Due to its recent utilization in the industries in this country, camel hair is an atopen which must be considered in testing for hypersensitiveness. Camel hair is found mixed with the wool in many heavy cloths.

C. *House Dust*

Few atopens are so widely used and give so many positive reactions as dust. In spite of this fact, the nature of the active principle contained in dust and the significance of the reactions obtained with it are still subject to debate. It may originate from the "linters" cotton found in stuffed furniture. Extracts of street dust are relatively inert in comparison with house dusts.

D. *Seeds*

1. Cottonseed, although not particularly common as an offending atopen, is one of the most potent as regards the severity of symptoms which it can produce. Cottonseed sensitive cases also manifest a tendency towards hypersensitiveness to other seeds, such as flaxseed and mustard seed, and to members of the pea, bean, and

nut families. The active principle in cottonseed is probably a protein.

2. Kapok seed — Sensitivity to this preparation is increasing. Many supposedly pure kapok preparations contain cotton. For this reason kapok should never be employed as a substitute for cotton in cases sensitive to the latter.
3. Flaxseed is an atopen with properties similar to cottonseed.

E. *Miscellaneous*

1. Orris Root — This atopen is a very important one in the etiology of atopic respiratory symptoms. Orris root sensitivity occurs much more frequently in girls than in boys because of its common use in cosmetics.
2. Glue—Dried glue from books and furniture may very easily produce asthma.
3. Tobacco—The odor of tobacco, rather than the smoke, is to be considered.
4. Purethrum—This substance is used in the preparation of insecticides.
5. Coffee Beans—As a cause of asthma, coffee is more often an offender as an inhalant than as an ingestant.
6. Insect Atopens and Excitants—Sensitivity to the body of the bee and to moths has been reported.
7. Mites, Fungi, Molds—These are becoming more and more important as allergens.
8. Various Botanical Excitants—Roots, buds, stems, flowers, leaves and seeds must be considered.

II. Ingestants

A. *Cereals*

Reports on the relative frequency of hypersensitiveness to the various cereals naturally differ. Practically all investigators agree that wheat sensitivity is by far the most common. The average of the results of recent observations reveals the order of incidence of hypersensitiveness to the various cereals to be as follows:

1. Wheat	4. Rice	7. Buckwheat
2. Oats	5. Barley	
3. Rye	6. Corn	

B. *Egg*

Hypersensitiveness to eggs is most frequently noted and most markedly developed in children. Fortunately it is one of those most quickly lost in childhood.

C. *Cow's Milk*

Milk is an important atopen in the first few years of life. Milk acts as an offender almost exclusively as a food atopen. Whole milk or its derivations, lactalbumin, casein, cheese, lactoglobulin and others have been employed individually and collectively for testing by various workers. The active principle in the milk atopen is a protein. The albumin fraction seems to give the most positive reactions, although other proteins are occasionally involved. Casein is considered the least significant of all. As heat alters the lactalbumin to a considerable extent, it is frequently possible for milk-sensitive children to take boiled cow's milk when raw milk cannot be tolerated.

D. *Fish and Shell Food*

Fish holds a prominent position among food atopens not because hypersensitiveness to it is unusually frequent but because it precipitates some of the most dramatic clinical pictures in atopy. With the possible exception of egg, no other food atopen may cause such a variety of symptoms of such a critical nature and with such suddenness as fish. Almost every type of fish and shellfish commonly included in the diet may cause trouble.

E. *Meats*

Sensitivity to the flesh of fowl and cattle is common among those who are particularly predisposed to sensitivity to animal atopens. It is probably about as frequent as fish sensitivity. The most important members of this group of atopens are:

1. Chicken	5. Duck	9. Squab
2. Beef and veal	6. Goose	10. Goat
3. Lamb and mutton	7. Turkey	11. Rabbit
4. Pork	8. Pheasant	12. Venison

F. *Nuts*

This group is a heterogeneous one containing members which represent different biologic families. Despite this fact there is a distinct similarity in their properties as atopens and they manifest a definite tendency toward group reactivity. The most common trouble-makers are:

1. Peanut	5. Chestnut	9. Pecan
2. Almond	6. Walnut	10. Pistachio
3. Brazil nut	7. Hickory	11. Hazelnut
4. Cocoanut	8. Filbert	

G. *Vegetables*

Considering the large number of foods in the vegetable group, it may be stated that the average incidence of hypersensitiveness to this class of foods is relatively small. An analysis of many reports and tables has been made in order to determine the commonest vegetable offenders.

1. Beans are found to be the most frequent troublemakers.
2. Leguminous vegetables, including peas, lentils, etc., with string beans holding only an insignificant position among them, are important allergens.
3. White potato, tomato and celery then follow.
4. Lettuce, cabbage and carrot come next.
5. Among the less important vegetables are:

a. Spinach	g. Cucumber	m. Egg plant
b. Squash	h. Mushroom	n. Garlic
c. Cauliflower	i. Sweet potato	o. Rhubarb
d. Onion	j. Green pepper	p. Beets
e. Asparagus	k. Brussel sprout	q. Olive
f. Turnip	l. Radish	

H. *Fruits*

Fruit hypersensitiveness is one of the least important forms of atopy due to foods. Statistics on the frequency of fruit reactions in different forms of atopy are meager, but averages compiled from the few reports available set the order of their importance as follows:

1. Orange	7. Pineapple	13. Apricot
2. Grapefruit	8. Grape	14. Watermelon
3. Peach	9. Apple	15. Prune
4. Pear	10. Cherry	16. Raspberry
5. Strawberry	11. Banana	17. Plum
6. Cantaloupe	12. Fig	

Multiple sensitivity to fruits is rather frequent.

I. *Spices and Condiments* (Flavors and Sauces)

1. Mustard is the outstanding atopen of this group. Occasional mention is made of pepper and vanilla, but with these and a few other exceptions spices and condiments as atopens have received little attention from allergists.
2. Pepper may cause disturbances as a food but is probably even more important as an inhalant.
3. Less important spices and condiments are:

a. Mace	f. Curry
b. Bay leaf	g. Sage
c. Ginger	h. Allspice
d. Cinnamon	i. Cayenne
e. Paprika	j. Nutmeg pepper

J. *Chocolate-Cocoa*

Sensitivity to this atopen is common and the treatment is removal from the diet.

K. *Honey*

This atopen is more interesting than important as sensitivity to it is rather infrequent. It usually produces gastro-intestinal upsets, but may also cause asthma, urticaria and other symptoms. Hypersensitiveness may sometimes exist only to certain specimens of honey. In those instances, the intolerance may exist for the particular type of plants which the bee has been visiting.

L. *Beverages*

Milk, coffee, and cocoa (chocolate) are unquestionably the most important members of this group and have already been discussed under separate headings.

M. *Medicinal and Chemical Agents*

1. Acetylsalicylic acid (aspirin) is one of the most com-

mon offenders. Asthma caused by this atopen is often of the severest type and of lengthy duration.
2. Quinine may produce symptoms similar in nature and severity to those caused by aspirin.
3. Ipecac, although a cause of sensitivity among adults, especially pharmacists, is not an important atopen for children.
4. Antipyrin, amidopyrine, phenacetin, codein must not be forgotten.

III. CONTACTANTS

A. *Silk Worm*
This atopen is more frequently an offender as a contactant than as an inhalant. Silk and woolen cloth are of equal importance as contactants.
B. *Cosmetics and Perfumes*
C. *Poison Ivy*
D. Practically any substance can act as a contactant.

IV. MISCELLANEOUS EXCITANTS

A. *Parasites*
Intestinal parasites seem to be gaining more and more importance.
B. *Physical Agents*
Sunlight, heat and cold.
C. *Bacteria and their products.*

Second, a most accurate history of the patient's illness is of major importance. Although the physician may primarily be instrumental in obtaining the first history, the mother may be of great assistance in revealing additional facts of ultimate value in the treatment of the case. This is especially true in connection with allergic diseases of children. Special emphasis must be placed on the time of onset, the outstanding symptoms, the course of the allergic disease from month to month or year to year, the previous allergic disorders and associated or concomitant allergic disorders. It has been stated that a careful record should be made of all dates. It is important to account for all the time.

An essential part of the history concerns the environment and particularly the changes in environment and whether or not these changes were accompanied by corresponding changes in symptoms. The practice of visiting the patient's home is always worthwhile and often necessary.

Third, the cutaneous tests must be considered. Much has been written concerning the value of dermal testing in determining the causative agent in allergic disease. Early reports in the literature were chiefly concerned with the scratch method. The introduction of the intracutaneous method marked the onset of a controversy as to the relative merits of the two main methods of cutaneous testing. The pioneer investigators used extracts and solutions which had been crudely prepared and they differed greatly in their testing technic. It is not surprising, therefore, that these workers could come to no significant agreement on the matter.

Today the powdered and fluid extracts are definitely more potent than they were a decade ago and their quality will continue to improve. The powdered extracts need no longer be used for the scratch method. Glycerinized concentrated liquid extracts are now available. This material has led to the introduction of another technic. In place of the customary scratch through the upper layer of the epidermis, oblique and shallow punctures are made. This procedure is referred to as the pressure-puncture method of cutaneous testing. It is a relatively painless procedure when properly performed and all patients will tolerate it with little complaint.

The cutaneous tests are of greatest value in hay fever and asthma, and of least value in urticaria and gastrointestinal allergy. The size of the skin reaction is not always an indication of the importance of the test. A small response (erythema) might indicate sensitivity of clinical value. On the other hand, many so-called positive tests are of little value.

With the increasing use of the skin for the detection of various sensitiveness it is important to keep in mind that the reactions elicited in the skin give merely a visible record in part at least of the immunologic past history of the patient and per se do not portray a present illness. A correlation between positive tests and the history and observations in the allergic patient is necessary for an accurate diagnosis.

The question of variations in technique as well as irritability of reagents in nervous, emotional and physiologic activity, as well as the choice of the skin area tested, greatly effect the reactivity to the tests. The differences in interpretations frequently leave the management of the patient in a most unsettled state. Whether the skin test is scratch, intracutaneous or patch, the accuracy of the conclusions must rest in the close correlation of symptoms and course with exposure and withdrawal, respectively, of the substances incriminated by this method of detection.

Fourth, when the results of the cutaneous tests are negative or unsatisfactory, the so-called elimination or trial diets should be tried. In the child and in the young adult, these diets are often very valuable.

Experience shows that success in connection with the trial diets depends in many instances upon the thoroughness with which they are carried out by the patient. A great deal of time must therefore be taken in explaining each diet in detail, emphasizing especially all possible sources of error. The general health of the individual on elimination diets should be closely watched. Be sure the patient receives the proper number of calories, a sufficient amount of the minerals such as calcium and phosphorus, and an adequate supply of vitamins.

In planning an elimination diet consider the following:

1. Eliminate the foods to which a patient gives positive skin reactions or a positive history.
2. Diet should contain foods to which patients are infrequently sensitive as determined on the basis of skin reactions and histories of food dislikes and disagreements checked by diet trial. The leading causes of allergy according to this list, in the order given are wheat, eggs, milk, chocolate, tomatoes and potatoes.
3. Include as few foods as possible and yet prepare balanced meals with sufficient caloric intake and the maintenance of carbohydrate, protein, mineral and vitamins. These requirements will differ according to age. A child's diet will have to contain larger quantities of protein, vitamins, and minerals due to the growth factor.

A single sensitization to a food may occur, but usually sensitizations to many allergens of the same type and occasionally of various types exists. Practically all proteins are allergenic. One outstanding exception is gelatin.

Many times in children there is a correlation between dislikes in food and actual allergy. Such dislikes are at times the result of past experience that the foods produce disagreeable symptoms. Therefore, this must be taken into consideration when planning an elimination diet.

Each basic elimination diet should include:

1. One or two carbohydrates.
2. One or two protein foods.
3. Two or three vegetables.
4. One or two fruits.
5. Some oil and sugar.

Foods included in the diet:

Cereals—rye and corn.
Meats—lamb and bacon.
Vegetables—asparagus and beets.
Fruits—apricots and pineapple.
Fats—olive oil, corn oil, and the fat from the meats.

In addition there are the foods allowed on any allergic diet. They are tapioca, sage, unflavored gelatin, baking soda, cream of tartar, egg free baking powder, refined and brown sugar, molasses, syrup, salt, white vinegar.

Two sample menus can easily be prepared from the foods listed.

Diet I.

Breakfast:
Pineapple juice—1 cup.
Cream of rye—⅔ cup with one tablespoonful of syrup.
Bacon—3 slices.
Corn bread—1 slice.
Apricot jam—2 teaspoonfuls.

Lunch:
Lamb chops—2 small ones.
Asparagus—3 ounces (by weight).
Ry-krisp—one piece.
Pineapple salad—1 slice with 2 tablespoonfuls of French dressing made with corn oil and white vinegar.
Apricot tapioca—½ cup made with apricot juice and sugar.

Dinner:
Lamb patties—3 ounces (by weight).
Beets—3 ounces (by weight).
Asparagus salad—3 ounces with 1 tablespoonful of French dressing.
Corn bread—1 slice.
Cornstarch pudding made with 1 slice of pineapple, sugar, and pineapple juice.
Apricot juice—1 cup.

Diet II.

Breakfast:
Apricot sauce—⅓ cup.
Cornmeal cereal—⅓ cup with two tablespoonfuls of syrup.
Bacon—3 slices.
Rye (100 per cent) bread toast—1 slice.
Pineapple jam—1 tablespoonful.

Lunch:
Roast lamb—3 ounces (by weight).
Harvard beets—3 ounces (with cornstarch, sugar, and vinegar).
Ry-krisp—1 piece.
Asparagus salad—3 ounces (with the special French dressing).
Apricot cornstarch pudding (no egg or milk).
Pineapple juice—1 cup.

Dinner:
Lamb broth with 2 ounces of diced lamb and 1 ounce of asparagus.
Apricot salad—2 ounces with 2 tablespoonfuls of special French dressing.
Bacon cornmeal muffins (no egg or milk).
Pineapple gelatin made by flavoring gelatin with sugar and pineapple juice.

The omission of milk, milk products and egg yolk causes the basic elimination diet to be deficient in calcium. Beans, cauliflower and asparagus can furnish calcium, but the latter vegetable is the only one used. Therefore, calcium gluconate or lactate are often added to the diet. A palatable form of calcium gluconate is that prepared by Flint, Eaton and Co. (Decatur, Illinois) and called Effervescent Calcium Gluconate. One to two teaspoonfuls may be placed in any fruit juice and given three times a day with each meal.

Phosphorus is also very low in the diet because of the absence of milk, eggs, and some cereals. To meet this deficiency, dicalcium phosphate is employed. Most popular with children are the D.C.P. wafers of Parke, Davis and Company, or the Dulcet-bars (5 segments) of Abbott Laboratories. The preparations can be obtained flavored with mint or chocolate. One to three wafers or bars are used each day.

Iron seems to be taken care of fairly well in the basic trial diets since it is found in the cereals, meats, vegetables and fruits. However, ferric ammonium citrate is ordered by some physicians. Iron pyrophosphate can be administered by employing the Cofron Tablets (soluble) of Abbott Laboratories. These tablets consist of soluble iron pyrophosphate and copper sulphate (U.S.P.). A tablet is dissolved in fruit juice and given once or twice a day.

As to the vitamins, first consideration must be given to vitamin A. Eliminating egg, milk, milk products, fish, fish oils, and many of the vegetables reduces the vitamin A intake markedly. Carotene (pro-vitamin A) in cottonseed oil offered by the S.M.A. Corporation of Cleveland is a good source of vitamin A. The child requires 5 to 10 drops per day. Afaxin (Winthrop Chemical Company) is a highly concentrated and purified preparation of vitamin A. One capsule may be given each day.

The best natural sources of vitamin B are the whole grain cereals. Other sources are milk, some meats, vegetables and fruits. Recently vitamin B has received much attention. It is now added to practically every elimination diet. Young children tolerate White's Vitamin B complex very well. It is a liquid containing vitamin B, riboflavin, and other B complex factors. Usually 5 to 10 drops are given before each meal. White's Vitamin B complex concentrate tablets can also be obtained. Kapseal Combex of Parke, Davis and Company may be employed. The kapseals containing the vitamin B complex may be offered to older children.

The exclusion of citrus fruits and many vegetables cuts down tremendously the vitamin C content of the

basic trial diet. However, this vitamin can easily be added to the diet by simply using cevitamic (ascorbic) acid tablets. The majority of the pharmaceutical organizations market a 25 mgm. tablet which is given two or three times a day in water.

Finally, we are concerned with vitamin D. It is found mainly in fish oils. Until fish is added to the diet, fish oils should not be used. Therefore, viosterol has commonly been employed as a substitute for cod liver or halibut liver oil. Some physicians have used crystalline vitamin D in propylene glycol. This preparation is called Drisdol and it is offered by the Winthrop Chemical Company. If there is definite evidence that no sensitivity to fish exists, then the Percomorphum oil (50 per cent) of Mead, Johnson and Company, or the White's Cod Liver Oil Concentrates can be administered in the regular standard doses.

The trial or elimination diet must be taken for at least ten days or even longer. If relief does not occur, another trial diet must be used. Not the slightest amount of any food not listed must be taken. To insure this, the parents must be fully acquainted with the diet. This cannot be stressed too much. Complete coöperation is absolutely necessary. Due to the small number of foods offered, it is essential for the child to eat large amounts of each food to insure a sufficient caloric intake. If the body weight decreases, the specified sugars, starches and oils must be increased.

Children present a more encouraging situation than adults. A new idea has appeared in connection with the development of allergic diseases. It is referred to as preventive allergy. Infants and children inherit the ability to react to some substance in the diet or in the environment if their parents have or have had allergic disorders. Certain things are more likely to cause trouble than others. If the baby or child remains away from these irritants there is a good chance that allergic manifestations will not develop. Why feed the infant a wheat cereal when wheat is known to cause so much eczema in early life? It is best to start out with rye, rice and barley cereals. Eggs can cause hives of various forms. Too much milk, especially raw milk, is bad for the baby or young child who has an allergic background. Certain vegetables also can cause trouble. Beans, peas, potatoes, tomatoes, celery, lettuce, cabbage and carrots have all been able to produce allergic reactions in the early years of life. Sometimes orange, grapefruit, peach, pear, or strawberry upset the infant or child, leading eventually to some allergic condition such as hives or eczema. The habit of flavoring milk with chocolate or cocoa is a poor one for children who come from allergic parents or who have already shown some evidence of an allergic manifestation such as a slight reddening and roughening of the skin which may be the forerunner of eczema.

There are also the inhalants. No child who has had or has eczema should go near any farm animals. The child can very easily become sensitive to horse dander. The same thing holds true for the goat, cow, hog, sheep and rabbit. Any one or all of these animals may be a menace to the allergic child. Household pets should never be permitted if there is any indication that the child will become sensitive to them. Many thousands of children have developed severe asthma in this country because of their close association with dogs whom they consider as their pals. The feather pillow can easily cause asthma or the feather dust can irritate the lining of the nose so that each morning the child may sneeze. There may be a watery nasal discharge with obstruction. Breathing through the nose is difficult and the individual is considered to have an infection. In fact, the parents believe that the child has just one "cold" after another. However, when such a condition exists, think of allergy. These warnings and suggestions constitute preventive allergy of today.

The Treatment of Common Diseases of the Skin*

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THE management of diseases of the skin is an important problem in the daily practice of the average physician. The patient is acutely conscious of abnormalities of the skin, either of the signs or of the symptoms, because the skin is not only the largest but also the most accessible of the organs of the body. Present trends in popular advertising furthermore tend to focus the attention of the individual on minor disfigurements of the skin as well as on its common affections. In every magazine and in most drugstores the observer sees tempting varieties of guaranteed cures and does not realize that their very abundance is the best argument against their usefulness.

It is hardly necessary to emphasize the important relationship of dermatology to the field of internal medicine. Younger physicians, properly schooled in this precept, are less inclined to shy away from the interpretation and treatment of diseases of the skin than are their older colleagues, who, although they are adept in the art of affording symptomatic relief, nevertheless will be ready to admit their confusion in dealing with dermato-

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logic problems. In recent years, important advances have been made in the study of cutaneous disease, not only of those conditions which are external, such as the fungous affections and contact dermatitis, but particularly of those in which the skin has been able to reflect significant signs of underlying systemic disease. Examples of the latter group include pruritus and allergic diseases, xanthoma in relation to disturbances of lipoid metabolism, lupus erythematosus, the tuberculids, Hodgkin's disease and the other types of lymphoblastoma. Furthermore, it may be well to mention that in the growing field of industrial or occupational diseases with its medicolegal implications more than 75 per cent of the cases have to do with diseases of the skin.

In this paper I will consider some of the common dermatologic disorders with their treatment. It is impossible to cover the field adequately in this short summary, but emphasis will be placed on the practical points of management, in the belief that the use of a few procedures well mastered will be more valuable than the endless listing of textbook formulas and prescriptions. In this connection, it may be well to emphasize that in dermatology, as in other fields of medicine, the key to efficient treatment is accurate diagnosis.

TABLE I.
Classification of Pruritus

Localized Pruritus	Generalized Pruritus	
	Skin Diseases	Systemic disorders
Pruritus hiemalis (legs, trunk).	Asteatosis.	Hepatic disease Jaundice.
Stasis dermatitis (legs, ankles).	Bath pruritus.	Uremia.
Pruritus ani, scroti, vulvae.	Parasitic affections Acarus (scabies). Pediculosis (lice). Cimex (bedbugs). Pulex (fleas). Pediculoides (mites).	Diabetes.
Neurodermite (nucha, eyelids, neck, hands, thighs).		Pregnancy.
Contact dermatitis (face, extremities, genitalia).		Hyperthyroidism.
Seborrheic dermatitis (scalp, face, chest).		Cachexia.
Empetigo contagiosa (face, hands).	Trichophytids.	Arteriosclerosis. Senile pruritus.
Insect bites (mosquito, chigger).	Miliaria.	Psychic changes Dermographia. Neurotic excoriations.
Pediculosis (scalp, axillae, pubes, hairy trunk).	Lichen planus.	Acarophobia.
Trichophytosis (feet, hands, scalp, genitalia, beard, trunk, arms).	Dermatitis herpetiformis.	Lymphoblastoma Granuloma fungoides. Hodgkin's disease. Leukemia.
	Contact dermatitis.	Lymphosarcoma.
	Urticaria.	
	Neurodermatitis.	
	Dermatitis medicamentosa Arsphenamine. Barbiturates. Quinine. Morphine.	

Pruritus: General Considerations

Pruritus is the subjective sensation known as itching which is the distressing feature of so many skin diseases. No one has satisfactorily explained the mechanism of pruritus. It is apparently a form of hyperesthesia produced by the elaboration of a histamine-like substance from endogenous sources, as in urticaria, or in response to the introduction of foreign materials from without, as in the parasitic affections. Pruritus may be constant or intermittent; nocturnal paroxysms with insomnia are common. The degree of pruritus is usually proportional to the amount of cutaneous disease that is present, although, since pruritus is a functional disorder, symptoms are always aggravated by a neurotic temperament. A convenient grouping of diseases in which regional or generalized pruritus is the outstanding complaint is listed in table I.

Winter Itch, Asteatosis, Bath Pruritus

Itching commonly occurs among those who have a dry, harsh skin when the natural dryness is aggravated by cold weather, contact with wool, the use of hard water or the too liberal application of soap in bathing. Careful examination of the skin in such cases will reveal a condition of microscopic chapping. This situation obtains frequently among patients in hospitals, where a daily bath and alcohol rub are routine procedures, and if itching develops, more alcohol is used or drying lotions of the calamine type are prescribed. Such persons need to revert to the good old-fashioned American institution of the Saturday-night bath. Soap may be used to the exposed surfaces, the hands, feet and folds of the body, but the glabrous surfaces should be merely sponged off. The use of strong remedies for the relief of pruritus is to be condemned. It is better, if there is distress and beginning dermatitis, to eliminate the use of soap, to immerse the patient for twenty to thirty minutes daily in a mildly alkaline tepid bath to which cornstarch or bran or boiled oatmeal has been added. Directions for the oatmeal-soda bath follow:

Oatmeal-soda bath. Thoroughly cook two cups of bulk oatmeal in 1 quart of boiling water for thirty to forty-five minutes in a double boiler. Allow to cool for fifteen minutes, then add half a cup of baking soda. Pour the entire mixture into a gauze bag and tie shut. Place in a bath tub a half to three-fourths full of water at 90 to 96°F. The patient may stay in the tub for one-half to two hours, expressing the oatmeal mash through the gauze and applying it to the body. The mash should be washed off thoroughly before leaving the tub and the patient dried by patting, not by rubbing.

After the bath, and as often thereafter as needed, the entire skin is anointed with a soothing lotion such as a well-shaken mixture of equal parts of olive oil and lime water. The following lotion has more lasting qualities and is more antipruritic.

℞	Gm. or cc.
Menthol	0.6
Phenol	4.0
Zinc oxide powder	20.0
Lime water and olive oil in equal parts to make	240.0

Clothing should be worn loose and constrictions at the waist and garter levels should be eliminated.

If the area of pruritus is limited, simple creams may be prescribed.

℞	Gm. or cc.
Boric acid	3.0
Rose water ointment	60.0

or

℞	Gm. or cc.
Ichthyol (Merck)	1.8

Zinc oxide ointment	60.0

Directions:

Apply when necessary, each time cleansing the skin gently with oil.

Pruritus of the legs is often related to faulty circulation in association with varicose veins. Dermatitis, pigmentation, scarring and ulceration may or may not be present. In such cases, supportive elastic bandages are helpful, but are only temporary expedients. For permanent benefit, providing the deep circulation is adequate, the veins must be obliterated by the injection of a sclerosing solution, such as sodium morrhuate (or monoethanalamine oleate), and in addition, in certain instances, an incompetent saphenous vein needs to be interrupted by ligation at the level of the femoral triangle.

Parasites

Parasitic infestations with scabies or pediculi are overlooked frequently because they are obscured by secondary changes incident to trauma and infection. On the other hand, personal acquaintance with the patient, his social status or his apparent cleanliness may lull the suspicions of the physician in regard to the correct diagnosis. In the treatment of scabies, the use of pyrethrum ointments is finding favor in place of the often irritating sulfur compounds. For pediculosis strong soap, vinegar rinses and inunctions of mild mercurial ointment are still found to be highly effective.

Anal and Vulvar Pruritis

Regional pruritus of the anus and external genitalia presents a challenge to the therapeutic ingenuity of the physician which is not solved by the application of the most recent formula or mechanical procedure. Fungous infection, such as thrush or epidermophytosis, must be sought and eliminated if it is present, and to this end calamine lotion, to which is added 2 to 5 per cent precipitated sulfur, is often helpful. Obesity is often an unappreciated factor of importance. The incidence of hemorrhoids, anal fissures and constipation in anal pruritus and of uterine displacements and diabetes in vulvar pruritus has been exaggerated in the average textbooks out of proportion to actual occurrence. If the local hygiene is ideal, a large functional element in association with excitement, fatigue and chronic nervous exhaustion still remains as a background for this type of pruritus. Vulvar pruritus occurs frequently at the menopause, and in such cases, estrogenic therapy is distinctly helpful. Actual leukoplakia of the vulva, kraurosis of the vulva and senile vulvitis usually are asymptomatic. Alcohol injection of the perianal tissues for relief of pruritus should be reserved for treatment of cases in which the condition has stubbornly resisted all other forms of control. Roentgen treatment of pruritus of the anus and vulva is not without hazard from the accumulation of dosage in the prolonged management of such chronic disorders.

Eczema

The signs of dermatitis venenata are usually self-evident because of the pruritus and an erythematovesicular eruption which appears first of all on the exposed surfaces. Success in ferreting out the offending irritant depends on the detective instinct of the physician. Most common offenders are the vegetable oils of poison ivy, primrose and ragweed. In such cases a complete bath with soap and water is imperative; this should be followed by dressings of soothing compresses made with 0.5 per cent aqueous solution of aluminum subacetate, or a saturated solution of magnesium sulfate, in alternation with drying applications of calamine lotion. Often skins of this type are hypersensitive in many ways, and such potential irritants as adhesive tape should be kept away from direct contact with the skin. The zinc oxide component of calamine lotion may be irritating; instead, cornstarch may be substituted.

℞	Gm. or cc.
Prepared calamine	16.00
Starch	48.00
Glycerin	0.20
Liquefied phenol	0.20
Distilled water to make	250.00

Oily lotions should not be used if the source of the pruritus is thought to be a vegetable irritant such as poison ivy, because the active agent in such cases is oil-soluble and an oily lotion would spread it widely. When small patches of localized dermatitis are present, the use of powdered benzoyl persulfide by inunction relieves pruritus for three or four hours. This is also of value in the relief of the pruritus of bites of insects such as mosquitoes and chiggers.

Countless agents are possible factors in producing hypersensitivity in the form of contact dermatitis. Except in industry, the list of irritants most concerned includes some common chemicals, and a number of these are frequently used in topical applications in the treatment of diseases of the skin. For example, mercury in ammoniated mercury or in the mercurial disinfectants, formalin, resorcinol, sulfur, tars and the local anesthetic agents, nupercaine, benzocaine, butyn and procaine hydrochloride are all potent sensitizers. Other common household irritants are the dyes for hair, clothes, shoes and furs, cosmetics, nickel in jewelry and spectacle frames, turpentine, plants, photographic developers and clothing such as wool, rayon, silk or fur. It must be remembered that prolonged contact of the skin with an irritant without the appearance of an untoward reaction is no assurance that dermatitis will not occur eventually. Likewise, when chemicals are applied with apparent impunity in the treatment of skin diseases, there exists the possibility of producing hypersensitivity on continued use.

The treatment of chronic urticaria, angioneurotic edema and atopic dermatitis (neurodermatitis) is too involved to permit of extended consideration here. The consensus of experienced observers seems to be that the factor of food sensitivity in these cases, in the adult at least, has been greatly exaggerated. Although skin tests result in positive reactions in many instances, correlation between such reports and the actual experience of the patient is poor. Treatment in each case is symptomatic,

with emphasis on restricted physical and intellectual activity. The application of tar ointments and ultraviolet rays is helpful although palliative, and in severe cases, a change of environment to a sunny dry climate such as Arizona seems the only solution.

Infections

Of the acute infections of the skin, impetigo contagiosa often produces violent pruritus, and some new methods of treatment may well be mentioned. In the first place there is careful cleansing with soap and water. Ointment of ammoniated mercury is the old stand-by, but it should not be used in U.S.P. strength of 10 per cent, for it frequently produces dermatitis. The hands, in all cases, should be kept clean, and antiseptic applications should be rubbed under the fingernails. In resistant infections I find the following formulas useful:

℞	Gm. or cc.
Sulfanilamide powder	0.75
Olive oil	1.8
Lanolin to make	15.0

or

℞	Gm. or cc.
Hydrogen peroxide	0.9
Butyl alcohol	30.0

or

℞	Gm. or cc.
Acriflavine	0.15
Gentian violet	0.3
Glycerin to make	30.0

The last named is likewise valuable in the treatment of perlèche, cutaneous thrush and painful fissures of the skin and mucocutaneous junctions.

In the treatment of epidermophytosis of the feet, soakings and wet dressings of potassium permanganate (1:10,000) are the remedies most in favor for the acute stages. Under ordinary circumstances, when cotton or gauze compresses are used for wet dressings, the chemical soon is reduced to an inert brown-staining material. This can be avoided by the use of a finely spun fiber glass ("Corning" Brand No. 008) which is moistened and applied directly to the affected skin, where it maintains the desired contact of the unchanged chemical for an extended period of time. When the bullae and crusts can be removed, the usual measures of treatment are followed, which include the use on alternate days of Whitfield's ointment (half strength) and 2 per cent iodine in benzene. In the presence of hyperhidrosis and recurrent epidermophytosis I use the following formula as a dusting powder to the toes, socks and shoes:

℞	Gm. or cc.
Powdered alum	3.0
Sodium hyposulfite	12.00
Boric acid and magnesium carbonate in equal parts to make	60.0

Directions:

Use as dusting powder.

For certain dermatologic conditions in which sulfur is useful, as for example, dermatitis herpetiformis, a sulfur bath two or three times a week is helpful. It is also valuable in the prevention of reinfection by autoinoculation in cases of recurrent furunculosis.

℞	Gm. or cc.
Precipitated sulfur (finely pulverized)	500.00
Sodium hyposulfite	120.00
Sulfuric acid, diluted	250.00
Distilled water to make	4000.00

Directions:

500 cc. (one pint) to each bath.

A strong sulfur paste, consisting of 30 per cent finely precipitated sulfur in zinc oxide ointment, is recommended for certain types of seborrheic dermatitis and in cases of pityriasis rosea in which there is much pruritus. High concentrations of sulfur in ointments are less irritating than lower concentrations.

Lymphoblastoma

When the skin is extensively involved in a chronic process of lichenified pigmented dermatitis with a severe degree of pruritus, it is important to consider the possibility of lymphoblastoma in the background. Generally, there is superficial lymphadenopathy, perhaps some increase in density of the hilar shadow as shown by roentgenograms of the thorax, but studies of the blood smears are usually inconclusive, except for evidence of eosinophilia. In all such doubtful cases, a specimen should be removed from a representative site of the involved skin and the tissue studied by a competent dermatopathologist. If the evidence is inconclusive, a lymph node may be excised for similar study, but in most cases, the desired information can be obtained from a section of the skin. Granuloma fungoides may exist for years in the form of superficial eczematoid plaques before typical tumors begin to appear. Hodgkin's disease, leukemia cutis and lymphosarcoma give signs of cutaneous involvement in 25 per cent of cases, and often the skin first of all shows the presenting symptoms of the disorder in the form of generalized intractable pruritus; the lesion may persist for months or years in this stage before confirmative evidence of its true nature can be identified elsewhere. Treatment by roentgen rays provides worthwhile although temporary relief.

Medical Observations in India

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BECAUSE India is exactly half-way around the globe, I decided to leave by way of the Pacific and return by way of the Atlantic. It was necessary to stop over in Shanghai for six days to wait for the boat to take me to India. I spent the mornings in the hospitals in Shanghai; there are a number of good hospitals there. Most interesting to me were the deficiency diseases found among the refugees from the war-wrecked country. I found it difficult to find a case typical of only one type of deficiency disease. Usually the picture was that of starvation, rickets, scurvy, and probably beriberi as well. The doctors in charge usually attributed the conditions found to two or three types of deficiency diseases rather than to the lack of one vitamin only. Probably the most distressing complication of vitamin deficiency was the keratomalacia seen in half a dozen of the infants and young children. I observed one patient over a period of four days. On the first day the cornea looked a bit like an interstitial keratitis but without the hyperemia. The cornea was cloudy and almost soapy, like a lye burn. The next day it was bulging badly and on the third and fourth days the cornea had melted away almost completely and the lens was protruding through the opening. At that time there were several such cases in various stages of development. In the patients that lived, the resultant condition was blindness, a staphyloma of scar tissue taking the place of the cornea. Most of these infants died.

One patient with scurvy had a unilateral exophthalmos which changed to a bilateral exophthalmos the next day. This was due to an intraorbital hemorrhage—a condition found in something like 10 per cent of scurvy cases. All in all, I thought that most of these cases appeared to be as much starvation as deficiency diseases, but the doctors told me that I was mistaken in thinking that, for most of them had sufficient polished rice to live on. Furthermore, no more such cases were coming from the refuge camps in which the children were being given sufficient relief funds so that one egg a week could be added to the diet. It surprised me to see that such a small amount of vitamin as one egg a week would suffice.

I arrived in Shikarpur, India, January 1, 1940. The annual job of putting the hospital in shape for its two months run was taking place at this time. The hospital was made possible by the donation of a large sum of money by Sir Hirinand, a wealthy Hindu and a native of Shikarpur. It has been in existence for over thirty years, but it is open only during January and February of each year. During these two months, Sir Henry Holland comes from his home in Quetta, about 300 miles away up in the hill country, and brings with him about ten nurses and two or three American doctors who come each year by appointment. He gives this district of some five million people the only modern eye surgery available throughout the year. Obviously, even if they were a healthy race of well fed people such as we are in America, there would be a great deal of eye surgery to be done among five million people if the work were bunched into two months of the year, but with the diseased and debilitated Hindu or Mohammedan peasants, there is, of course, more work.

We did 1180 cataract operations while I was there; the work was divided evenly among Dr. Holland, his son Dr. Harry Holland, Dr. Pritikin of Chicago, and myself. Just how many other eye operations we did I do not know, but my records show that my share of the work was 41 lid plastics for trachoma, 33 optical iridectomies, 24 glaucomas, 9 lid currettings for trachoma, 5 lacrimal sac operations, and 16 miscellaneous operations, a total of 128 miscellaneous operations besides an even three hundred cataract operations. I am told that this was a bit less than the average amount that one gets to do there, but I felt that it was quite enough and really much more than I had expected it would be.

As you all know, it has been the habit among eye men to keep eye patients flat on their backs for a week or so following a cataract operation. Only in the past decade have many of the leading eye surgeons in this country been allowing their patients to be up and round a day or so after the operation. Until I saw how patients were handled there, I had been afraid to allow a patient any freedom at all after he had been operated upon, but I saw no ill effects of allowing them up and about in India. Although we kept patients in the hospital ten days to two weeks, fed them, examined them daily, and gave them a rough refraction and a cheap pair of glasses when they left, we did not give them any nursing care except the rounds that the nurses made twice a day. In spite of that fact, and in spite of the fact that they were up and around almost at once, we had only eight serious iris prolapses out of 1180 cataract operations.

Another interesting point was the use of chloroform. We gave chloroform in 80 cataract cases and although they vomited as one would expect, we found no bad effects upon the operated eyes. We lost one patient, a Mohammedan child of 3, through chloroform anesthesia. The nurse giving it had had considerable experience and probably was not to blame for the death, nor did the child appear to be in poor physical condition.

India, as you may know, is the mother of cataract surgery. Couching operations were performed there more than 2000 years ago, as is proven by ancient Indian writings. The couching was done in two common ways: either a sharp needle was inserted into the eyeball and the lens pushed down and back into the vitreus in the hope that it would be out of the line of vision, or else

the eye was tapped and an attempt made to loosen the lens and allow it to drop back into the vitreus. The former method done with little or no asepsis usually resulted in infection. Or, if the eye got by without that, the capsule of the lens was ruptured, its contents setting up an inflammation within the eye and the eye eventually was destroyed from this inflammation. Many eyes are still being couched in India. We saw quite a number that had been couched. Sometimes it was possible to remove the lens with a spoon and to save the sight if the couching was not done too long ago. It may be of interest to you to hear that there is a man in Iowa doing couching operations. He uses an electrical device and shakes the lens loose. Often such eyes will see for two or three years and their bearers tell many people of the wonderful electrical cure. Few people hear of the eventual blindness that usually follows from the damage caused by the lens floating about and being absorbed by the vitreus.

In general, there are two modern methods of operating on a cataract in an adult: (1) the intra-capsular method in which the lens is removed capsule and all; and (2) the capsulotomy, in which the nucleus is removed together with as much cortex as it is possible to remove. In a thoroughly ripened cataract the much simpler and easier operation, the capsulotomy, is very satisfactory because the cortex is liquefied and can be quite easily and thoroughly removed. If, however, there is much clear cortex, it is difficult if not impossible to remove sufficient cortex to avoid the necessity of needling the eye several times before vision can be obtained. Therefore, when, either because of lack of skill or for some other reason, the surgeon does not want to do an intracapsular operation, he may advise the patient to allow the cataract to ripen rather than do a capsulotomy and have a dense after-cataract forming from the retained cortex. Sometimes this waiting process takes many years, for often cataracts of a nuclear type ripen very slowly. For this reason, the intracapsular operation is extremely useful in these cases, and where it can be done, it will almost invariably give better results than the capsulotomy.

Whether the situation is good or bad, it is nevertheless true that most of the eye surgery is being done today by the older men who have not had the privilege of learning in their youth to do the delicate intracapsular operation. Perhaps this accounts for the lack of a standardized method of doing the intracapsular operation and for the lack of any sort of an agreement among the better known men as to the merits of the various intracapsular operations.

The intracapsular operation was originally invented or at least popularized by a British army surgeon, Colonel Smith of India. He toured this country and Europe with at least a quart jar full of cataracts which he had removed by this method during his services in India. However, he was, perhaps, too enthusiastic in attempting to remove the cataract in its capsule in many cases not suited to this method. When his method was tried by others, their results were anything but satisfactory, and many good men gave up the operation as being too apt to cause serious loss of vitreus. Others, led by such men as Barraquer in Spain, Elschnig in Germany, and Knapp in America, took to the use of some sort of a forceps for grasping the capsule in hopes that the slight pull they could make would lessen the pressure needed and make the operation safer.

Personally, I believe the results depend more on experience than they do upon the method. For instance, out of 300 cataracts which I did in India, 237 were intracapsular. Out of the first 118 intracapsular operations, I lost vitreus in 17 cases. Continuing with the same method I lost vitreus in only three of the last 118 intracapsular operations. The improved results were no doubt due to better application of the same method, together with the fact that I probably was better able to judge which cases were, and which cases were not suited to the intracapsular operation.

The Early Diagnosis of Acute Appendicitis in the Pre-School Child*

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THE mortality rate in acute appendicitis is highest in the very young and the very old. Whereas the average rates recorded for adults and older children run from about 3.5 per cent to 7.8 per cent, for children under 5 years of age and adults over 50 the average mortality rates are from 25 to 40 per cent.

This distinct contrast between the very young and the later periods of life excites the question as to whether the nature, pathology and etiology of the disease differ at different periods of life. It has been suggested by several writers that four possible factors are responsible for the high mortality in the pre-school group:

1. The inability of the examiner to get an accurate history from the patient.
2. The tendency for parents to administer laxatives at this age.
3. The fact that the appendix is high in the abdomen and has less protection from the omentum.
4. The fact that the walls of the appendix in the very young are thin and more quickly perforate.

These possibilities have stimulated our interest in the problem. We have presented here a statistical tabulation of 22 cases of acute appendicitis in children under 5 years of age admitted to the Minneapolis General Hospital since 1929 (table I).**

A careful scanning of these 22 cases reveals some interesting data. Of the total number only one was not operated upon (case 6). He returned in six weeks, and an interval appendectomy was performed. Sixteen of the 22 were admitted with localized or generalized peritonitis resulting from perforation. In two instances secondary mechanical appendicitis followed acute intussusception. There were 6 definite upper respiratory infections, 2 of which developed measles subsequently (cases 14 and 15). One patient had an acute purulent otitis media (case 3). Pneumonia when present was secondary to operation in every case but one (case 7). One child was run over by an automobile twenty-four hours before admission and suffered a fractured pelvis. The appendix was caught in the fracture and became acutely swollen (case 15).

Vomiting was a prominent symptom, being present in all but two cases. The temperature on admission was elevated in most instances, reaching a level as high as 105F. The leukocyte count ranged from 7,900 to 33,000. Diarrhea was a complaint in only one instance (case 13). Constipation was present in the majority of cases.

There were seven fatalities (32 per cent). They were all complicated by peritonitis alone or by peritonitis and pneumonia. The average length of time elapsed before diagnosis was definitely longer in the fatal cases. Laxatives were administered to 10 patients (45 per cent), to 4 upon a physician's advice!

A careful analysis of these 22 cases revealed no striking differences as to etiology, pathology or mortality rate between the infants under 2 years of age and those over. Nor was the course of the disease more frequently atypical in the younger group, except for the two cases of intussusception and appendicitis combined. The three facts which impressed us most from this study were:

1. The delay on the part of the parents in calling a physician.
2. The difficulty of physicians in making an early diagnosis.
3. The very frequent administration of laxatives.

The Pediatric Approach to Diagnosis

The early diagnosis of acute appendicitis in its typical manifestation is quite simple: sudden pain in the abdomen, primarily referred to the epigastrium, followed by nausea and vomiting, and then by general abdominal sensitiveness, most marked on the right side and more particularly over the appendix, with elevation of temperature soon after the onset of pain. Such a story brings to mind the great Murphy's classical description of acute appendicitis. This typical picture occurs most frequently in adults and in children over 6 years of age. But for the atypical 20 per cent of attacks in children over 6 years, and in almost all children under 5 years of age, insistence upon such a history and symptoms may lead to errors and delay in diagnosis. It must be emphasized at the outset that for the early diagnosis in the pre-school age group "all the king's horses and all the king's men" are necessary.

Observation. If there were objective and certain methods of determining first the presence and then the location of pain, the early diagnosis of acute appendicitis could be made with greater frequency and the mortality rate could be decreased. Obviously there must be abdominal pain in this disease. Wherever in our series a history was obtainable, abdominal pain was always recorded. In the younger infants, crying and screaming were always present. These two symptoms, however, are common in children of the pre-school age group. The problem is to differentiate between pain caused by disease and other extraneous causes of crying.

Every specialty has its bag of tricks, and here especially the pediatrician must make use of his bag. If the infant is crying or begins to cry when the doctor enters the room, he must wait until the child quiets down. While he is waiting, he can learn a great deal by general observation. Does the child look anxious? Is the

*Presented in part before Abbott Hospital staff by Dr. Seham.
**Table I, courtesy of Dr. A. V. Stoesser

Case Number	Age	Sex	Location of Pain	Vomiting	Fever	Diarrhea	Constipation	Anorexia	Leucocyte Count	Laxative	Interim between Onset and Operation	Physical Findings	Clinical Diagnosis	Operative Diagnosis	Autopsy Diagnosis
1	4 yrs.	Male	Umbilical	+	101°F	−	−	+	23,800	−	36 hrs.	Flushed Face. Rigidity of R. L. Q. and R. L. Q. Tenderness in R. L. Q.	Acute Appendicitis	Acute gangrenous appendicitis	
2	4 yrs.	Female	Lower Abdomen	+	104.4°F	−	+	−	?	−	72 hrs.	Pharyngeal injection. Morbilliform eruption. Very ill and listless. Diffuse abdominal tenderness and rigidity.	Measles. Acute Appendicitis with perforation and generalized peritonitis.	Acute gangrenous appendicitis with perforation and generalized peritonitis.	
3	2½ yrs.	Male	Diffuse	+	102°F	−	+	+	8,150	+	36 hrs.	Knees doubled on abdomen. Purulent drainage from right ear. Diffuse abdominal tenderness and rigidity.	Acute right otitis media. Possible acute appendicitis.	Acute gangrenous appendicitis with perforation and generalized peritonitis.	Bronchopneumonia and generalized peritonitis.
4	3 yrs.	Male	Umbilical	+	101.8°F	−	+	+	26,100	+	60 hrs.	Tenderness and rigidity in the R. L. Q. of the abdomen.	Acute appendicitis.	Acute gangrenous appendicitis with perforation and generalized peritonitis.	Bronchopneumonia and generalized peritonitis.
5	4½ yrs.	Male	Lower Abdomen	+	101.8°F	−	+	−	21,600	+	48 hrs.	Acutely ill with flushed and anxious facies. Generalized abdominal rigidity and tenderness.	Acute appendicitis with perforation and generalized peritonitis.	Acute gangrenous appendicitis with perforation and generalized peritonitis.	
6	3 yrs.	Male	?	+	103°F	−	−	−	33,000	−	Interval Appendectomy perform'd 6 wks. later.	Diffuse abdominal tenderness. Mass palpable in the R. L. Q.	Acute appendicitis with perforation and abscess formation.	Subacute appendicitis with old abscess formation.	
7	2 yrs.	Male	Lower Abdomen	+	103°F	−	+	+	20,350	−	30 hrs.	Diffuse abdominal tenderness and rigidity. Mass palpable in the R. L. Q.	Acute appendicitis with abscess formation. Pneumonia.	Acute gangrenous appendicitis with perforation and abscess formation.	
8	4 yrs.	Female	R. L. Q.	−	101°F	−	+	−	17,450	+	27 hrs.	Knees flexed. Drowsy. Tenderness and rigidity in the R. L. Q.	Acute appendicitis.	Acute appendicitis.	
9	1 yr.	Female	?	+	101°F	−	+	−	9,100	+	96 hrs.	Hypertrophied tonsils and pharyngeal injection. Diffuse abdominal tenderness and rigidity.	Acute upper respiratory infection. Possible acute appendicitis.	Acute appendicitis with perforation and abscess formation.	Generalized peritonitis.
10	4 yrs.	Female	Diffuse	+	100.4°F	−	+	+	17,000	+	72 hrs.	Diffuse abdominal rigidity and tenderness. Most marked in the R. L. Q.	Acute appendicitis.	Acute gangrenous appendicitis with perforation and generalized peritonitis.	
11	2 mos.	Female	?	+	100.2°F	−	+	+	18,950	−	17 days	Abdomen distended and diffusely tender. Mass palpable in the R. L. Q.	Acute appendicitis with perforation and abscess formation.	Acute gangrenous appendicitis with perforation and abscess formation.	
12	2 yrs.	Female	R. L. Q.	+	102°F	−	−	+	20,100	+	72 hrs.	Tenderness and rigidity in the R. L. Q.	Acute appendicitis.	Acute appendicitis with abscess formation.	
13	4 yrs.	Male	Lower Abdomen	+	100.4°F	+	−	−	15,900	−	72 hrs.	Abdomen distended and diffusely tender. Tenderness most marked in the R. L. Q.	Acute appendicitis.	Acute appendicitis with perforation and abscess formation.	Bronchopneumonia and generalized peritonitis.
14	4 yrs.	Female	Diffuse	+	102°F	−	−	+	14,700	−	36 hrs.	Pharyngeal injection. Cervical adenitis. Bronchitis. Diffuse abdominal tenderness.	Acute upper respiratory infection. Acute appendicitis.	Acute gangrenous appendicitis.	
15	3 yrs.	Male	Diffuse	+	103.2°F	−	−	−	10,450	−	34 hrs.	Pharyngeal injection. Diffuse abdominal rigidity. Bronchitis. Tenderness in the R. L. Q.	Acute upper respiratory infection. Fracture right pubis. Acute appendicitis.	Acute appendicitis.	
16	1½ yrs.	Female	?	+	101°F	−	+	+	19,900	+	60 hrs.	Pale, peaked expression. Abdominal distention. Diffuse abdominal tenderness.	Possible acute appendicitis.	Acute appendicitis with perforation and generalized peritonitis.	Acute gangrenous appendicitis with perforation. Gen'd peritonitis.
17	2½ yrs.	Male	Diffuse	+	102°F	−	+	−	24,600	+	48 hrs.	Cervical adenitis. Abdominal rigidity in the R. L. Q.	Acute upper respiratory infection. Acute appendicitis.	Acute gangrenous appendicitis with perforation and generalized peritonitis.	Old healed peritonitis. Pneumonia.
18	3 yrs.	Male	Diffuse	+	100.2°F	−	−	−	16,600	−	24 hrs.	Acutely ill. Knees flexed. Diffuse abdominal tenderness and rigidity.	Acute appendicitis with perforation and generalized peritonitis.	Acute gangrenous appendicitis with perforation and generalized peritonitis.	
19	3 yrs.	Male	Diffuse	+	101°F	−	+	−	17,000	+	48 hrs.	Lower abdominal rigidity. Tenderness in the R. L. Q.	Acute appendicitis with perforation and generalized peritonitis.	Acute gangrenous appendicitis with perforation and generalized peritonitis.	
20	4 yrs.	Male	Lower Abdomen	+	99.8°F	−	−	−	18,000	−	9 days	Pharyngeal injection. Tenderness, rigidity and mass in the R. L. Q.	Acute upper respiratory infection. Acute appendicitis with perforation and abscess formation.	Acute gangrenous appendicitis with perforation and generalized peritonitis.	Not obtained.
21	2 mos.	Male	?	−	99.4°F	−	−	+	7,900	−	8 hrs.	No abdominal tenderness or rigidity. Mass in the R. L. Q.	Intussusception.	Intussusception with mechanical appendicitis.	
22	8 mos.	Male	?	+	105°F	−	+	+	17,500	−	15 hrs.	Stuporous. Cylindrical mass in the R. L. Q.	Intussusception.	Intussusception with mechanical appendicitis.	

TABLE 1

facial expression one of pain, or is he just fussy and fearful? Does he insist on being in his mother's lap all the time, or is he willing to lie in bed and be left alone? Patient and prolonged observation of the child's behavior and facial expression will bring its reward. It is sometimes even necessary to pretend to leave and return without the child's knowledge and watch, so to speak, out of one eye. Is the breathing thoracic or abdominal? Is it shallow or deep? Is it difficult and painful and interrupted by crying? Does the child try to sleep, suddenly awakening with pain? Does he lie with his legs flexed, especially his right one? Is the abdomen distended? Is there a visible mass?

If the hands are carried to his head or the head is kept buried in the pillow, or if the child pulls at his ears, one becomes suspicious of a headache or an otitis media or some infection within the head. If the child demands to be held tight against the mother's chest and finds relief in that position, so-called colic or some non-infectious disease of the abdomen may be present. If he cries or makes grimaces when he tries to swallow, the throat comes to one's mind as a source of trouble. It is especially important to notice keenly the response of the child to any muscular movement, either passive or active. Pain upon movement of the head may reveal a wry neck with an acute adenitis. Pain on movement of a joint or an extremity points to an acute epiphysitis or scurvy or the beginning of an acute osteomyelitis. Sudden touching of the scalp which produces wincing of the child may uncover a boil of the scalp. These simple observations before the physical examination is begun are just as important as the history and the physical examination. A child of 2 years will tell that he has a pain. He may not tell one at first exactly where it is, but with patient prompting he may soon put his hand on his "tummy", and if one touches the abdomen, the child will pull the hand away. Even at the end of the first year, the infant may indicate the site of pain by carrying the hand to that spot. In the infant who does not talk, the physician must depend upon careful observation of the child's facial expressions, his behavior, his position and his response to touch and palpation.

Examination of the abdomen. Upon the examination of the abdomen depends the confirmation of the clues obtained from observation and the history. It is very difficult to examine a baby's abdomen if the child is crying. A toy, a bottle of milk, and as a last resort, a sedative such as chloral hydrate may be necessary to make an adequate abdominal examination. If the baby cannot be examined lying on its back, sometimes it is necessary to have the mother hold the baby to her chest. The hand is then slipped in between the mother's chest and the baby's abdomen. If there is voluntary rigidity or if the baby cries, it is impossible to interpret accurately the results of an abdominal palpation. Deep palpation should always be left to the very last. For the same reason, McBurney's point should be the last place to press. The patient should be placed in the most comfortable position reclining on two pillows, absolutely flat on its back with the legs flexed. The physician's hands must be warm, and palpation should be very gentle. Holding other parts of the body to distinguish crying from true tenderness gives one a basis for comparison. A sharp turn of the ankle which will shake the abdomen may produce a sharp pain in the abdomen. Extension of the right leg will produce the same response. The examining hand is then passed lightly over the entire abdomen and held without any pressure. The loins and groins are then palpated to estimate the resistance of the muscles. Homologous muscles on both sides of the body are used for comparison. If there is reasonable certainty in the doctor's mind of localized tenderness, all other methods of diagnosis should be used to confirm the first suspicions. If during the palpation the right leg is held flexed because of tenderness, it is highly suggestive of an acute appendicitis. Even against the most resistant crying during the short span of a few seconds of relaxation between respiration, the doctor may confirm his suspicions. If for any reason the physician is compelled to leave the bedside in doubt, he should make use of the more refined methods of diagnosis and call in surgical consultation if necessary. Negative observations are just as important as positive ones.

Accessory aids in diagnosis. There are of course other accessory methods of diagnosis which are of some value but upon which too much reliance should not be placed. Rectal examination should always be the last step in the examination. If it is done at the beginning, it may interfere with an adequate abdominal examination. The finger helps to rule out intussusception by establishing the presence of blood in the rectum and a pelvic mass. Impacted feces are also diagnosed in this way.

Abdominal percussion only confirms palpation. It should always be light. Masses may be localized in this way. Dulness in the flanks may be elicited. The use of the stethoscope is relatively new for this purpose. It is of value in a negative way. Absence of peristaltic sounds is strong evidence of peritonitis. Tests have been described which offer some help in diagnosis, such as rebound tenderness, hyperesthesia of the skin and others. Here again it must be emphasized that they should be used only in accessory roles.

PERITONITIS

Although this paper is concerned with the very earliest diagnosis, the physician may not be called until the stage of perforation, and at this time it is necessary to recognize immediately the signs and symptoms of peritonitis. A child with beginning peritonitis has an anxious expression. He resents manipulation and holds himself as immobile as possible, lying either flat on his back or on his right side. At the same time he is extremely listless. Although the temperature and pulse are of very little differential value in the early stages, after peritonitis has set in they are of utmost importance. The pulse rate is rapid, as high as 160, and the temperature increases very quickly to 105°F. or 106°F. If the child is already in a state of collapse, the pulse remains fast and the temperature may fall to a subnormal level. The most important single objective sign of the onset of peritonitis is abdominal distension. If in addition a mass is felt on the right side, the etiological diagnosis of appendicitis is certain. Should the distension be localized to

the pubic area, a distended bladder must first be eliminated. If there is any doubt, a catheter should be passed. Visible peristalsis must always be considered. This can often be excited by flicking the abdomen. If present, it is diagnostic of primary obstruction. In peritonitis the body in defense against pain tries to immobilize respiration. When the child is asked to take a deep breath and the respiratory movement is entirely absent over the abdomen, it is very suggestive of peritoneal involvement. In the absence of heart and renal disease, edema of the abdominal wall is also diagnostic of peritonitis.

Differential Diagnosis

First of all one must eliminate those conditions which by producing crying simulate appendicitis. There is of course the proverbial pin. Sudden piercing screaming with kicking and writhing is usually diagnosed by the parents, yet many physicians have been called out in the dead of night to find the pin still in the flesh or a small bleeding point and an open safety pin in the diaper. The traditional colic and teething as causes of crying need only to be mentioned. Fissure in ano and hard stools should be routinely ruled out.

In addition, many conditions of extra-abdominal as well as intra-abdominal origin may so closely simulate appendicitis in childhood that the keenest judgment together with the most modern laboratory aids is required to establish a definite diagnosis. Of such *intra-abdominal* conditions the following are most commonly encountered:

Acute pyelitis. Inflammation of the genitourinary tract more commonly occurs in girls. It usually makes its appearance late in the course of another infection, such an infection in most cases being located in the upper respiratory tract. The onset may rarely be acute. The pain is generalized or located in both lower abdominal quadrants. Occasionally it may be confined to the flank on either side. The temperature is high and may be of an irregular or septic type. Chills may occur at irregular intervals. Dysuria and polyuria may or may not be present. Examination of the abdomen reveals no evidence of peritoneal irritation, and, finally, an analysis of the urine will confirm or eliminate one's suspicions.

Idiopathic or primary peritonitis. The onset is sudden and may be initiated with a chill. A history of obstipation and failure to pass gas may be obtained. The patient appears acutely ill. The abdomen is noticeably distended, and the pain is continuous. The pain is generally diffuse but most pronounced in the lower half of the abdomen. Board-like involuntary rigidity of the entire abdomen may be elicited. The patient presents the so-called "Hippocratic Facies" with sunken eyes, pinched nose, dilated nares and anxious expression. The leukocyte count is high with an absolute increase in the polymorphonuclear cells. If a vaginal discharge is present, examination should be made for the gonococcus organism. A diagnostic paracentesis is indicated. If we recognize the presence of peritonitis, irrespective of the etiology, we have done our job well.

Intussusception. This condition is limited almost entirely to infants under 1 year of age. It runs an afebrile course and is characterized by a sudden sharp recurring pain in the abdomen which is so abrupt that the mother knows quite definitely the exact time of each attack. There is something almost characteristic about such an attack. The pain is so sharp and agonizing that the infant throws himself about and claws at things within his reach. In the interim he is perfectly quiet and may even smile and play. Vomiting is an early symptom. In spite of the severe abdominal distress there is no tenderness or rigidity. The mass in the right side of the abdomen together with rectal bleeding and fluoroscopic demonstration of a telescoping of the bowel makes the diagnosis a certainty.

Intestinal obstruction. This condition does not occur as frequently in infants as does intussusception. It is characterized by a rhythmic and colicky pain which increases in severity until it becomes dull and constant. Vomiting always occurs at some time during the course of the condition. Abdominal distension becomes progressively more pronounced as this condition progresses. Obstipation is complete, although the bowel below the point of obstruction may empty itself. A roentgenographic study reveals the presence of air above the point of obstruction. Since a common cause of obstruction is strangulated hernia, one must always inspect the pubic area.

Chronic constipation. Occasionally one is called to see an older child doubled up with cramps. The pain is generalized and there may be tenesmus. A history of constipation may be obtained. The temperature is normal. The abdomen is soft to palpation and not tender. A hard ribbon-like mass may be present in the left lower abdominal quadrant. Rectal examination reveals the presence of a large amount of impacted feces. Evacuation of the rectum results in prompt relief of symptoms.

Internal abdominal injuries. There is a history of trauma to the abdomen, and there may be external evidence on the skin. The child sometimes presents a picture of shock. Pain is at first localized but with the advent of peritoneal infection becomes diffuse. There may be evidence of visceral bleeding. In the event that rupture of the intestine has occurred, free air may be visualized in the peritoneal cavity by roentgenographic study.

Distension of the urinary bladder. A history of urinary retention is obtained. A tumor mass is visible and palpable in the suprapubic area. Pain and tenderness are localized to the bladder area, and catheterization results in prompt relief.

Cholecystitis and choledocholithiasis. These conditions are of very rare occurrence. The pain is located in the right upper abdominal quadrant. The skin may be jaundiced. The stools often assume a clay-white color. The pain may be referred to the back and the shoulder. The gallbladder is often palpable.

Among the *extra-abdominal conditions* which are most likely to be confused with appendicitis, the following deserve mention:

Diabetic acidosis. The pain is diffuse and there is generalized abdominal tenderness, but there is no abdominal rigidity. The abdomen is scaphoid-shaped. The temperature is usually normal. Constant hyperpnea with

an acetone odor of the breath is characteristic. Urinalysis reveals the presence of sugar, acetone and acetic acid.

Meningitis. It may seem strange that abdominal pain is a symptom of meningitis; yet it is complained of not infrequently. It occurs late in the course of the disease. The severe headache, vomiting, stiff neck and drowsiness arouse one's suspicions. Examination of the spinal fluid will establish or rule out the presence of meningeal infection.

Typhoid fever. There is usually a history of several days' fever and lassitude before the patient complains of pain. Distention of the abdomen is present, but there is no true rigidity. The spleen is palpable, and rose spots may be visible. A leukopenia with a relative lymphocytosis is present. The presence of the organisms in the blood or stools and a positive Widal reaction confirm the diagnosis of typhoid fever.

Acute catarrhal jaundice. The pain is located in the uppermost part of the right upper abdominal quadrant, but there is no true rigidity. The temperature is only slightly elevated, if at all. The liver may be enlarged and tender. Icterus is present and the stools assume a white clay-like appearance. The van den Bergh test is direct or biphasic. Bilirubin may be demonstrated in the urine.

Migraine. A history of allergy is obtained either in the patient or in the family. The attacks of generalized abdominal pain are periodic and associated with severe nausea, vomiting and headache. There is no true abdominal rigidity. The temperature may be elevated in the younger child. The leukocyte count is normal, but an eosinophilia is usually present.

Acute rheumatic fever. (Schoenlein's purpura). The abdominal pain is usually generalized and associated with other manifestations of rheumatic fever, such as joint pain and swelling. Petechiae, ecchymoses and urticaria are often seen on the extremities above and below the joints that are involved. The abdominal signs usually precede these cutaneous manifestations. The sedimentation rate is elevated. A systolic murmur and other evidence of organic heart disease are corroborative.

Henoch's purpura. This condition is characterized by sharp intermittent colicky pains in the abdomen due to hemorrhage into the bowel wall. The abdomen is tense and tender. Petechiae and ecchymoses of the skin soon make their appearance. The leukocyte count is normal, and there is usually a thrombocytopenia.

Measles and scarlet fever. During the prodromal period the abdominal pain is severe and continuous. Acute coryza, bronchitis and Koplick's spots differentiate measles from appendicitis, but it must be borne in mind that the two conditions may occur together. In scarlet fever the definite angina followed by the appearance of a punctate erythematous eruption leaves little doubt as to the correct diagnosis.

Mumps. Abdominal pain may occur after the swelling of the parotid glands disappears. The pain is referred from an acute orchitis. The diagnosis is established by discovering the enlarged painful testes, and eliciting a history of previous parotid swelling.

Lead poisoning. The onset is usually insidious. There is a history of increasing pallor, headaches, vomiting and recurrent attacks of abdominal pain. This condition is often confused with recurrent appendicitis. The afebrile course, the history of ingestion of lead, the gingival lead line and, finally, the basophilic stippling of the red blood cells make the diagnosis a certainty.

Pneumonia and pleurisy. Respirations are noticeably difficult and rapid. The face is flushed and there is dilatation of the nares. A grunting type of respiration may be present. The leukocyte count and temperature usually reach a higher level than in acute appendicitis. The abdominal pain is located at a higher level, and there is less tenderness and rigidity. Deep inspiration may cause pain in the right side of the chest. Physical signs in the chest suspicious of pneumonia may be confirmed by roentgenographic study.

Acute upper respiratory infections. Such attacks most commonly occur during the cold months. They are ephemeral and recurrent. Abdominal pain is the complaint for which the physician is most frequently called, and the similarity to appendicitis is at times so striking that it is necessary to perform an exploratory laparotomy to establish a definite diagnosis. The temperature and leukocyte count are usually only slightly elevated. The pain may appear early—colicky in nature and often referred to the umbilical region. The child frequently says while pointing to the umbilical region, "It hurts in 'my stomach'." There is no abdominal rigidity and little if any tenderness. The pain may be dull and aching and persist for several days, even though the temperature may subside. In such a case there is a tendency for the pain to be more diffuse and the tenderness more pronounced. This is the more difficult form to differentiate from appendicitis. It must be emphasized that both conditions may and not uncommonly do occur together.

In conclusion we should like to hammer home some appendicitis axioms.

1. Any and all signs of abdominal pain should make one appendicitis minded.
2. All of the pediatric tricks should be used to keep the infant quiet.
3. Prolonged and patient observation should always precede the physical examination.
4. If the physician leaves the bedside with any doubt in his mind, he should use all the refined methods of the hospital for further examination.
5. Observation to suspect and palpation to confirm are the keystones of early diagnosis.
6. Purgation, procrastination and perforation are the three horsemen of death in acute appendicitis.
7. It is better to look and see than to wait and see.
8. The clinician must decide whether the situation is extra-abdominal or abdominal, and if the latter, whether it is surgical or non-surgical.

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The Choice of Operation for Vesical Neck Obstruction*

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In any case of vesical neck obstruction, it is desirable to employ the method of operation that is best suited to the patient and to his particular form of obstruction. To employ the operation that is best suited to the doctor is still more important. If the surgeon who does the job is not qualified to do it properly it will not help much to choose the operation best suited to the patient. Both patient and doctor will be better off if the doctor employs the particular operation best suited to his talent, and to his ability to perform it properly, even though it is not academically the operation best suited to the patient and his particular form of obstructive deformity. Certainly mortality, morbidity and general results will be best served if this consideration dictates the choice of operation.

Only if the surgeon's diversity of talent permits may the operation be suited to the patient. Therefore, I shall discuss most extensively suiting the operation to the doctor.

Three methods of operation for vesical neck obstruction are available: suprapubic prostatectomy, perineal prostatectomy and transurethral resection. Each one of the three makes a different demand upon skill, ability, training and experience.

Suprapubic Prostatectomy makes the least demand on these. It is a relatively fool-proof procedure. Combined with some degree of general surgical ability and some experience in the procedure itself, it is capable of reasonably good execution in hands of average skill.

A well performed suprapubic prostatectomy yields an excellent result. Faults in its performance may increase mortality but the technic is so simple there is little opportunity for technical faults to give a poor result.

In experienced hands and surrounded by all the safeguards of adequate preoperative preparation and modern technical facilities, suprapubic prostatectomy is a well perfected procedure, yielding near perfect results. It has a mortality varying from 3 per cent at its best to 50 per cent at its worst. Just where between these extremes a particular surgeon will find himself depends on general rather than special talent.

Perineal Prostatectomy is a tricky and treacherous procedure. It requires intimate knowledge and familiarity with perineal anatomy. It is not just recognition of structures exposed and seen; it is knowing where they are and how not to see them—the lumen of the rectum for instance.

The keystone of the perineal operation is division of the rectourethralis muscle—an insignificant crop of fibers running between the rectum behind and the apex of the prostate and urethra in front and holding the rectum in intimate attachment with them. Only by division of these muscle fibers can the rectum be separated from these structures to permit its reflection and exposure of the prostate. In dividing this muscle there is no latitude between the proper dissection and an improper one. If it is carried too far posteriorly the rectum will be injured with resulting rectourethral fistula. If it is carried too far anteriorly the urethral sphincter will be injured with resulting urinary incontinence. When properly performed the operation yields a result just as perfect as can be obtained by suprapubic prostatectomy.

The really significant merit of perineal prostatectomy is its low mortality. For some reason there is no shock and it is peculiarly devoid of the fatal complications that go with the suprapubic operation.

Any surgeon can perform a perineal prostatectomy and no matter how badly it is done or how poor the result, the patient usually recovers. What surgeon is able to do a perineal prostatectomy properly and regularly secure a favorable result is another question. This requires long training, large experience and particular talent. Without these the functional result and morbidity of perineal prostatectomy will be so bad that no surgeon should forego the advantages of suprapubic prostatectomy, despite its higher mortality, in favor of perineal prostatectomy and its lower mortality.

Transurethral Resection. Of the three operations, this one makes by far the greatest demand on special skill, training, and experience. It is a highly technical procedure in which many factors are concerned and determine competence.

The first of these factors is adequate experience and ability in cystoscopy. Without these, competence in resection, even in easy cases, is inconceivable. The required cystoscopic ability is not merely that gained by routine diagnostic cystoscopy and observation of the bladder. One must know accurately the anatomy of the vesical neck and prostatic urethra and all the various forms of obstructive deformity. There must be ability to visualize and interpret these in detail—and to do so under handicaps that do not obtain in ordinary cystoscopy; a field obscured by bleeding and relations distorted by progress of the operation—mere glimpses through a red fog. It is no place for the casual cystoscopist who has given no particular attention to vesical neck observation.

Real competence in resection can be gained only by long experience with resection itself. The experience of all resectionists, the old and the young alike, abounds in evidence to this effect. Detailed analyses of successive groups of 100 cases each, made by resectionists of large experience, have shown a steadily decreasing mortality and decreasing incidence of poor results in successive

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groups of cases. It may be doubted that in any operation is there a greater premium on experience.

All suprapubic and perineal operations are much alike. Anyone competent to do them at all is competent to do them in all cases. This is not the case with resection. Depending on gland size, length of urethra, configuration of deformity, vascularity of tissue and many other factors, resection varies from a relatively simple and easy procedure to one of great complexity and difficulty that will tax the ultimate in skill and resourcefulness.

This fact makes competence as a resectionist dependent on another, somewhat ethereal, factor which applies little if at all to the open operations. This factor is the individual's own honest and accurate appraisal of his ability as a resectionist and willingness, despite the patient's clamour, to limit the procedure to cases that come within the scope of his ability. If the surgeon underestimates his ability, he will needlessly subject the patient to the greater risk, turmoil and long disability of open operation. This is not the usual error. If the surgeon over-estimates his ability as a resectionist, his shortcomings soon will be apparent in the form of poor results, morbidity and mortality. These will usually exceed the mortality, morbidity and poor results of open operation in his own hands. This error should be avoided in favor of keeping always in mind the fact that suprapubic and perineal prostatectomy were well perfected procedures before anyone ever heard of transurethral resection.

In view of all this, it is hard to understand why good old reliable suprapubic prostatectomy is replaced by a new and difficult procedure forced into hands where it does not belong.

I submit that in the choice of operation for vesical neck obstruction, the first and most important thing is to suit the operation to the doctor. When that has been done, and depending on the doctor's talent and ability in each of the three procedures, the operation may be fitted to the patient.

There can be no criticism or quarrel with the surgeon who has honestly appraised his ability in each procedure and, with this in mind, selects the operation that best serves the welfare of the patient in his hands—whether it be the suprapubic, perineal or transurethral method.

The fact that another surgeon, by another method, might have done better by the patient has no bearing on the honesty or ethics of the surgeon or the decision he makes. That would be to say that the best surgeon in the world, if there is any such person, should do all the operations in the world. A busy surgeon indeed! Besides that, we have not arrived at that degree of altruism—but at least we can be honest with ourselves.

SUITING OPERATION TO PATIENTS

Obviously this problem, being so conditioned by the talent and ability of surgeons, cannot be stated in any all-inclusive way. However, certain generalizations can be made. It will be attempted to make them in respect to the surgeon, or urologist, who first of all is a thoroughly competent cystoscopist, and has had long training and experience in use of all three procedures. The surgeon taken for illustration is not the world's best suprapubic or perineal prostatectomist, or the world's best resectionist. For purpose of the example let him be a well rounded competent doctor of experience who knows his own talents and limitations, thinks first of all of the welfare of his patient and knows something of the surgery of bladder neck obstruction.

In the hands of such a surgeon, transurethral resection will be the operation of choice in 80 per cent to 90 per cent of cases, suprapubic prostatectomy in about 15 per cent and perineal prostatectomy in the remainder.

Such a surgeon or urologist will reserve the suprapubic and perineal operations for cases presenting a degree of technical difficulty to resection that he appraises as exceeding his ability as a resectionist. Glands of very large size, abnormally vascular ones, and great elongation of the prostatic urethra make for such difficulty. Among these cases such a surgeon will have a preference for the suprapubic operation because of the comparatively poorer promise of a good result by perineal prostatectomy in his hands. However, if the patient is very old and decrepid, and a poor surgical risk, perineal prostatectomy will be the operation of choice, because of its greater safety. At the border line between good and poor surgical risks, such a surgeon will be influenced toward the perineal operation by features of the case that make this operation easy, such as a wide pubic arch, low lying gland, symmetrical bilateral lobe enlargement and absence of posterior commissural hypertrophy.

Technical difficulties are not the only contra-indications to resection. There is another indication for enucleation of the whole gland. Some prostates make trouble more by inflammatory changes than by the obstruction they cause. These cases are marked by persistent and recurring pyuria, purulent prostatic secretion, and a degree of dysuria and burning on urination out of proportion to the obstruction present. In such cases transurethral resection may relieve the obstruction to urination and rid the patient of his residual urine, but it leaves him with the remaining portion of his still infected prostate. So long as the infected gland remains, the pyuria, frequency, nocturia and dysuria incident to it will continue. Such glands, even if small and presenting no difficulty to resection, should be enucleated.

Some of the conclusions to this thesis are too obvious to be stated. It may be said, however, that in making a choice of operation for vesical neck obstruction, the surgeon who is fair to his patient and to himself, will limit his use of these three operations according to his ability to perform them. Always he will employ the operation which best combines with his particular skill and ability to serve best the welfare of the patient in his hands—whether it be by the suprapubic, perineal or transurethral method.

If we recognize this, and are governed accordingly, prostatic surgery will be perfectly individualized in respect to both patient and surgeon, and will best serve the welfare of patient, doctor, medical science and the truth.

The Physical Education Teacher as Health Counselor*

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THE term "counseling" is likely to suggest to a group of physicians and teachers the application of the techniques of the psychiatrist or the specially-trained mental hygienist. Let me state at the outset, therefore, that problems requiring for their solution the application of specialized clinical skills and techniques do not, in my judgment, fall within the province of the physical educator. Whenever there is evidence of personality deviation or a maladjustment requiring the attention of a psychotherapist the student should be guided as tactfully as possible to some competent practitioner in this field.

It is imperative for the non-medical teacher of physical education to distinguish clearly between education and therapeutics. If we are to avoid the possibly serious consequences of encroaching on the field of medicine, we must keep the counseling enterprise strictly within the area of individual health teaching.

The layman who dabbles in medicine may create more problems than he solves. Nevertheless there are many health problems, embracing considerable diversity, in which any well-trained, mature and experienced teacher can render significant service. Nearly all human beings —even those who would rate as normal and adequately adjusted—are frequently confronted with situations to which the most desirable response is anything but clear. Among college students the problems and the troublesome situations encountered are not only diverse in type, but they vary also of course in degree of significance. In some cases a little carefully selected reading will serve to clarify the situation. In many cases, however, the problems are such that "talking things over" confidentially with a trusted advisor is not only more satisfying to the student but also more effective in resolving his difficulty.

Since effectiveness in counseling depends upon the personal attributes of the counselor as well as upon his educational qualifications it is impossible to state without extensive study the proportion of our physical education personnel who are equipped to serve competently as health counselors. Probably all who are reasonably well prepared in their field can and do give much sound and genuinely helpful advice to many individuals. On the other hand, judging from students' reports of statements concerning health made by instructors of physical education, much of the advice given is open to question, and some of it is dangerously unsound. I am sure you are all familiar with some of the erroneous statements that have become almost classics, e. g., "The best treatment for a cold is a good vigorous workout." "Muscle soreness caused by muscular exercise is cured most readily by continued exercise." "The training diet should contain a larger proportion of meat." "Milk should not be included in the diet of an athlete." Some of this is based on abandoned tenets of biochemistry and some of it is just "old wives tales." I know one instructor of physical education who used his own prescription for colds until, on one occasion, he developed empyema and spent three weeks in a hospital recovering from the necessary drainage operation. He no longer advises this particular procedure, but he has some other gems which he still dispenses with unabated enthusiasm. In view of the foregoing, it must be evident that if departments of physical education are to assume some share of the responsibility for the health counseling of students only those staff members who have achieved competence in the field of hygiene should be encouraged to participate in the health counseling enterprise.

Now, I realize, of course, that to take time which has been allotted to a general paper to describe the achievements of one's own department is, to put it mildly, in bad taste. Nevertheless, since I have little knowledge of what is being done generally in the area I have been asked to discuss, I shall be compelled to confine my subsequent remarks largely to the particular enterprise in this field with which I am familiar.

About six years ago (1933) the Department of Physical Education of Columbia College conceived the idea of bringing into focus and systematizing the incidental and more or less casual health counseling of the sort which, I suspect, is carried on to some extent wherever there is a physical education program. The problem of organizing this individualized health teaching was a simpler one for us than it would be for many other departments of physical education because in Columbia College all of the hygiene offered in course is taught by members of the physical education staff. It was possible, therefore, for those members of our group who were responsible for class instruction in hygiene to learn something of the need for individual counseling and to gather some knowledge concerning the kinds of questions students wished to discuss. Then, too, our position as class room instructors in hygiene probably gave us some advantage at the outset in securing the confidence of students desiring advice.

When we were convinced that there was a need for a health counseling service the project was presented to the Dean of the College for his consideration. He approved it at once and authorized the assignment of a suitable room opening from the foyer of one of the men's residence halls to be used exclusively for this purpose. The room was furnished modestly but with some regard for comfort and dignity. Among the furnishings was a book case containing about fifty carefully selected titles. This book collection has since grown to more than 300 volumes. The room, as it appears today, might be described as a combination of

*Presented before the twentieth annual meeting of the American Student Health Association, New York City, December 28-29, 1939.
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office, library and consulting room. The door bears the inscription: "Department of Physical Education. Health Conference Room." The room is open during the day from six to ten hours each week and as many evenings as can be managed without undue hardship to the men who are considered qualified for this service. We have averaged about four evenings per week.

There has never been any published announcement of this counseling service. Each instructor of hygiene was asked to describe the project briefly and to extend an invitation to each of his classes. In addition, selected instructors of physical education activities were asked to make known to their students informally the fact that such a service was in operation. In our announcement to hygiene classes we stated our conviction that, though we encouraged class discussion, probably there were many questions which men preferred not to discuss in group situations. We stressed the fact that in all of these proposed personal conferences we would strive to establish a "man-to-man" rather than a teacher-pupil relationship and that whatever transpired would be "off the record." Moreover, we stated that there would be no preaching or scolding but that we would try to find the right answer and, failing that, we would refer the inquirer to some other suitably qualified advisor.

Apparently a large number of our students were convinced that we had something to offer. As evidence of this, by the third year of our experiment, we were able to report to the Dean that during that college year more than six hundred men had taken advantage of the opportunity extended to them. During the succeeding years the number of students reached through this service has remained between six and seven hundred, and we estimate that more than half this number have read selected material bearing on their respective problems. Although we have been very careful to refer to the Medical Office all cases that seemed to present medical problems, relatively few of these cases have been encountered. The great majority have been problems that fall within the field of hygiene.

Although no case histories have been filed, we have kept a tally of cases according to certain very general and more or less arbitrary categories. The record shows, among other things, that about half the conferences dealt with sex-problems or some aspect of sex behavior. Problems relating to food and nutrition were next in frequency.

Although we have no standardized method of measuring the values of this health counseling service it seems justifiable to assume that six hundred conferences annually with individuals who are sufficiently interested to seek health advice is a significant contribution to the health education program.

It may be alleged of course that the success of this particular enterprise in health counseling by physical education teachers depends upon the fact that the persons who conduct it are not teachers of physical education only but that they are also teachers of hygiene. Strictly speaking this is true, but they are all physical education men primarily. They have qualified in hygiene in response to the demands of a particular administrative plan. I believe there is relatively little that we are doing that can not be done as well by any selected group of well equipped teachers of physical education, provided they are willing to devote some time and effort to qualifying for this particular health-teaching opportunity.

Aside from medical consultants I believe there is no staff group in the College which enjoys such intimate and human contacts with students as does the physical education group. The informal and often confidential relationships which are constantly developing in training quarters, on playing fields and in locker rooms provide innumerable opportunities for individual health teaching. I feel reasonably sure that much wise and effective counseling is done in these situations. This volume of incidental health counseling is not included in the plan I have described. I'm afraid I have no plan to recommend for systematizing all those health-teaching potentialities. However, I'm sure they are significant, and I am equally sure that every teacher of physical education activities should be aware of these opportunities and should be equipped to make skillful and effective use of them. Moreover, it would seem that administrators of physical education should study the possibilities for systematically utilizing this volume of incidental counseling as a means of furthering the health outcomes of their programs.

Cold Prevention Studies*

Abortive Treatment with Benzedrine and with a Codeine-Papaverine Mixture

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PREVIOUS publications[1,3] have reported the results of controlled studies of certain medications and vaccines used for the treatment and prevention of the common cold. The present report is concerned with two types of medication which were used during the same period of time as the study of cold vaccines but on different groups of students. These two medications, the benzedrine inhaler and the codeine-papaverine mixture, were given in an attempt to abort colds at the very onset of symptoms, thus differing from the vaccines which were used strictly as preventives and given throughout the cold season.

Technique of Study

Since this study was in reality a part of the one previously reported, the general technique of the experiment was the same. The subjects were all University of Minnesota students who wished to participate because of definite cold susceptibility. At the time of the first visit the records of their physical examinations were reviewed and the students were questioned concerning the frequency, the types and the severity of the colds they usually experienced, and the loss of time from school occasioned by previous colds.

Experimental and Control Groups. The subjects were assigned indiscriminately to a control or to an experimental group. Those in the control group were treated in exactly the same manner as those in the experimental groups but received placebos instead of medication. All students thought they were getting medication. The physicians who saw the students at the Health Service when they contracted colds during the period of study did not know which groups they represented.

Reporting of Colds. The students in all groups were instructed to report to the Health Service whenever a cold developed in spite of the abortive treatment, and to keep a record of each cold of more than 24 hours duration. An additional report was obtained from each student monthly during the first year of the study and quarterly during the second year. The physicians who cared for the students when they reported to the Health Service with colds made notations on their records concerning the severity and the type of cold in each case. These records were checked later against the reports of the students.

Loss of Time. At the beginning of the study each student was instructed to keep a record of the number of days which he lost from school because of colds. These reports were checked by the physicians in the quarterly conferences with the students.

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At the end of each year reports as to the incidence of colds and the time lost from school were summarized according to experimental and control groups.

The Benzedrine Inhaler

Inhalation of volatile amphetamine (benzedrine) has been shown to be effective in causing decongestion of the nasal mucous membranes, thus affording some subjective relief from symptoms of the common cold.[4,11] The effect of such therapy on the duration of the illness is a disputed question, however. Boyd and Connell[9] reported no significant shortening of the course of the cold, while Sulman[6] believed he had evidence suggesting that the benzedrine inhaler caused abortion of colds and actually prevented the occurrence of further colds in susceptible persons. He reported that the regular use of the inhaler night and morning, plus more intensive use on definite exposure, kept a small group of highly susceptible persons from colds for long periods of time. Bertolet[8] also reported that the inhaler reduced the duration of the cold.

It was therefore decided to set up a controlled series in this study to test the benzedrine inhaler as a method of aborting colds.

Benzedrine Inhaler and Control Inhaler. The benzedrine inhalers were furnished by the Smith, Kline and French Company, of Philadelphia, and contained amphetamine (benzedrine), 325 mgm., oil of lavender, 97 mgm., and menthol, 32 mgm. The control inhalers furnished by the same firm were exactly like the benzedrine inhalers except that they contained no amphetamine. The appearance and odor of the two types of inhaler were indistinguishable.

The subjects were given written directions as to the use of the inhaler. They were told to carry it with them at all times so that it would be available whenever an attack seemed imminent, as manifested by a sensation of fullness in the head, sneezing, watery nasal discharge, watering eyes, etc. Such symptoms were to call for the use of the inhaler, two deep inspirations through each nostril once an hour as long as symptoms persisted.

Results. Table I is a summary of the results reported by students who used the benzedrine inhaler and the control inhaler during the years 1935-36 and 1936-37. The results have been tabulated so that comparisons can be made for each year separately as well as for the total period.

Two hundred seventy-nine students in the benzedrine group and 276 in the control group completed the study, representing 87 per cent and 92 per cent, respectively, of the number who began it.

TABLE I.
Results of Abortive Treatment of Colds with Benzedrine

	Benzedrine Group			Control Group		
	1935-36	1936-37	Total	1935-36	1936-37	Total
Number subjects who completed study	141	138	279	153	123	276
Per cent subjects who completed study	87.0	88.0	87.0	93.0	88.0	92.0
Average number colds per person during previous year*	5.7	5.3	5.5 ± 0.13	5.2	4.9	5.1 ± 0.08
Average number colds during year of study	1.4	1.2	1.3 ± 0.05	2.1	1.6	1.9 ± 0.05
Difference between experimental and control groups			.6 ± .07			
Per cent	—33.0	—25.0	—30.0			
Days lost from school, average per person	0.8	1.0	0.9	0.9	0.9	0.9
Subjects who had no colds of 24 hrs. or more duration during year of study, per cent	25.0	30.0	28.0	7.0	15.0	10.0

*Reported from memory.

TABLE II.
Abortive Treatment in Relation to Frequency of Colds

	Less than 6 colds previous year*		6 or more colds previous year*	
	Benzedrine Group	Control Group	Benzedrine Group	Control Group
Number of subjects	190	198	89	78
Average No. colds per person during previous year*	4.1 ± .04	4.1 ± .04	8.5 ± .29	7.6 ± .15
Average No. colds during year of study	1.2 ± .05	1.8 ± .06	1.4 ± .09	2.2 ± .12
Difference between experimental and control groups	.6 ± .08		.8 ± .15	
Per cent	—33.0		—36.0	

*Reported from memory.

During the two years of the study the *benzedrine group* reported an average of 1.3 colds per person per year. This represents a reduction of 76 per cent from the average of 5.5 colds per person per year which the same students reported for the two years prior to the study. At the same time, however, the *control group* reported a fall from 5.1 colds per person per year during the two years prior to the study, to 1.9 colds per person per year of the study. This represents a reduction of 63 per cent which, although below that for the benzedrine group, certainly nullifies most of the apparent benefit given by the benzedrine inhaler.

The table shows that there is no difference between the two groups in days lost from school.

The proportion of students who reported the development of no colds lasting 24 hours or more during the period of study was 10 per cent for the control group and 28 per cent for the benzedrine group.

In an attempt to determine whether the reduction in colds occurred in any particular group, a comparison was made between the results for those students having six or more colds and the results for those having less than six colds per year during the two years prior to the study. Table II, which presents this analysis, shows no significant differences between the groups.

CODEINE-PAPAVERINE MIXTURE*

The value of the codeine-papaverine mixture in the *treatment* of the common cold has been reported elsewhere.[1,2] It was noted that the earlier in the course of the illness, the better the results of this treatment. The present study includes the use of this treatment at the earliest symptoms of a cold in an attempt to abort the infection. The students were given 10 tablets of this codeine-papaverine mixture and instructed to take one tablet at the very first signs of a cold, then to continue medication at the rate of one tablet after each meal and two at bedtime. If the symptoms persisted longer than 24 hours they were instructed to report the cold to a Health Service physician. No special control group was set up as a control for this series, since it was decided that the placebo inhaler could serve as a control for both groups.

Results. Table III gives a summary of the results with this codeine-papaverine mixture. There were 224 stu-

*For this study tablets called "Copavin", containing 1/4 grain of codeine sulphate and 1/4 grain of papaverine hydrochloride were supplied by the Eli Lilly Company of Indianapolis.

TABLE III.
Results of Abortive Treatment of Colds

	Copavin Group			Control Group		
	1935-36	1936-37	Total	1935-36	1936-37	Total
Number subjects who completed study	128	96	224	153	123	276
Per cent subjects who completed study	84.0	92.0	87.0	93.0	88.0	92.0
Average No. colds per person during previous year*	5.5	5.1	5.4 ± 0.12	5.2	4.9	5.1 ± 0.08
Average No. colds during year of study	1.2	1.0	1.1 ± 0.05	2.1	1.6	1.9 ± 0.05
Difference between experimental and control groups			.8 ± .07			
Per cent	—43.0	—39.0	—42.0			
Days lost from school, average per person	0.8	0.7	0.7	0.9	0.9	0.9
Subjects who had no colds of 24 hours or more duration during year of study, per cent	26.0	41.0	32.0	7.0	15.0	10.0

*Reported from memory.

TABLE IV.
Abortive Treatment in Relation to Frequency of Colds

	Less Than 6 Colds Previous Year*		6 or More Colds Previous Year*	
	Copavin Group	Control Group	Copavin Group	Control Group
Number of subjects	152	198	72	78
Average No. colds per person during previous year*	4.1 ± .04	4.1 ± .04	8.0 ± .23	7.6 ± .15
Average No. colds during year of study	1.0 ± .06	1.8 ± .06	1.3 ± .09	2.2 ± .12
Difference between experimental and control groups	.8 ± .07		.9 ± .15	
Per cent	—44.0		—41.0	

*Reported from memory.

dents who completed the study. These subjects had a reduction of 80 per cent in the average number of colds per person per year of the study as compared to the previous years. This should be compared to the reduction of 63 per cent for the control group and 73 per cent for the vaccinated group.[3] There was a slightly lower average loss of time from school for the experimental group than for the control group, but this difference is probably not significant. Thirty-two per cent of all subjects taking the codeine-papaverine mixture escaped the development of any colds of 24 hours or more duration during the year, while 10 per cent of the control group likewise had no such colds during the period of study.

Table IV shows that the results for the codeine-papaverine mixture, like those for the benzedrine inhaler, are not significantly different for students reporting six or more colds in previous years than for students reporting less than six colds in previous years.

Complications

An attempt has been made to summarize the complications of the common cold which occurred during the period of this study in the students used as subjects in the various groups. The list of complications is incomplete, since it is likely that not all of the students came to the Health Service for treatment of their complications. However, the data probably would be relatively comparable by groups. Table V is a summary of these complications. The numbers are too small to justify any definite conclusions, but it may be of significance that the codeine-papaverine group presented only about 50 per cent as many complications as the benzedrine group, the vaccinated group, or the control group.

Summary and Conclusions

An attempt was made to evaluate the efficacy of the benzedrine inhaler and of the codeine-papaverine mixture in aborting the common cold.

The subjects were University students who wished to coöperate because of definite cold susceptibility.

A control group, made up of students chosen at random, and using a placebo inhaler, was observed during each year of the study. These students believed they

TABLE V.
Complications

	Influenza	Tonsillitis Pharyngitis	Pneumonia	Other Complications*	Total	Patients Hospitalized
Subcutaneous vaccine (3)	3	5	0	4	12	8
Oral vaccine (3)	2	8	1	19	30	9
Benzedrine inhaler	1	11	1	5	18	10
Control inhaler	1	7	1	7	16	11
Codeine-papaverine mixture	2	5	1	1	9	6

*Such as bronchitis, sinusitis, otitis media.

were receiving medication and were unaware of the existence of control groups.

Attention is again called to the remarkable reduction in the number of colds which members of the control group reported during the experimental period as compared to the number that the same students reported for the previous years. This fact emphasizes the need for controls in studies of the value of any form of medication.

The group using the benzedrine inhaler experienced an average of 30 per cent fewer colds than did the control group. Twenty-eight per cent of students using the benzedrine inhaler were successful in avoiding the development of colds of 24 hours or more duration during the period of the study, while 10 per cent of the controls likewise had no colds.

The group using the codeine-papaverine mixture experienced an average of 42 per cent fewer colds than did the control group. Thirty-two per cent of these students had no colds during the period of study, as compared to 10 per cent for the control group.

There were fewer complications among the students of the codeine-papaverine group than among those of the benzedrine, the vaccinated, or the control groups, but the data are not sufficient to be conclusive in this regard.

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The Acute Exanthemata and their Differential Diagnosis in the College Age Group*

(Colored Photography as an Aid in Teaching Problems)

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THIS discussion includes the more significant points which are of value in the diagnosis of the acute exanthemata and observations intended to be of assistance in the differential diagnosis of the acute contagious conditions, having cutaneous manifestations, from some of the skin eruptions associated with drug ingestion or other pathology. I have also included examples of skin conditions which are, in most instances, non-contagious but which offer difficult diagnostic problems and considerable confusion.

The idea of using color photography to show more clearly shades of color, accentuation of eruption and distribution of lesions is not original with me by any means and no such claim is made. However, it has been my feeling that the acute exanthemata and confusing conditions can be so much more clearly taught using this means of visual imagery than by the usual textbook methods. It has been our experience at the University of Wisconsin to have several examples of one condition at one time but not to have a wide variety at all times. This causes difficulty when attempting to teach medical students and student nurses the fundamental diagnostic

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NOTE: It is extremely difficult to bring out many of the points made in this discussion without the visual accompaniment of the colored photographic slides which were used when the material was originally presented to the group in New York City. Much of the comment and many of the observations need the photographic results to support and to substantiate the conclusions.

features from textbook or from word descriptions.

The photographs are made on Kodachrome* film and the final result is a 2″x 2″ slide which can be projected and enlarged to almost any size, depending only upon the projector and the size of the room within which the projection is taking place. The colors reproduced are very true and so far as I have been able to determine do not fade with repeated projections. Photographs of single lesions, as in chickenpox or molluscum contagiosum, can be reproduced in any size to show details as umbilication, crust formation or vesiculation, which is impossible under ordinary clinical conditions, with a number of students in the patient's room. The acutely ill patient can be photographed quickly with little disturbance, but no one of us would take a group of students to see and individually examine the unfortunate patient. Often the open discussion of the condition before the patient is undesirable, which is another advantage of the photographic method of teaching.

A collection of colored photographs will gradually increase, thus giving the student not one but often a number of examples of chickenpox, scarlet fever or measles, which is of considerable advantage from the standpoint of instruction and demonstration.

My collection includes views of chickenpox, scarlet fever, measles, drug eruptions, herpes zoster, widespread epidermophytid skin reactions, pityriasis rosea and versicolor, molluscum contagiosum, Dick test reactions, blanching tests, smallpox vaccination reactions in all stages, examples of seborrheic dermatitis which are frequently very confusing, lichen planus, the secondary eruption of syphilis and others. With a collection of this sort the points of similarity and the diagnostic differences between eruptions, contagious or otherwise, can frequently be demonstrated so that the student is impressed with some of these things in a way that has never been possible by the textbook description method. It makes instruction dynamic and lifelike rather than static as it is so frequently in discussing a condition when one has never seen an example of the disease.

Some of these will be discussed and a few of the photographic advantages demonstrated. The first of these will be chickenpox, which is probably the most frequently seen of all of the exanthemata among college students.

A. *Chickenpox (varicella).* Some textbooks state that the condition is rare in adults but we have had numbers of cases and never a year passes that our service fails to care for a case. Usually a day or two before the eruption appears the patient complains of headache, symptoms of malaise and sometimes sore throat. Males often report that "pimples" were noted on the face when shaving.

The colored photograph shows the small macular area of erythema which is the first to appear in most cases, and in a few hours (6 to 24) the vesicle can be seen centrally placed in this area. In almost every case in the young adult there are lesions on the scalp and frequently in the mouth as well as on the palms of the hands and soles of the feet, in addition to the trunk and face lesions. The eruption can be demonstrated in all stages and photographs of single "tear-drop" or "dew-drop" lesions are available in color. The umbilication and crusting can be shown and differential points brought out by projecting views of smallpox, herpes zoster and molluscum contagiosum in color for comparison. The numbers of lesions in the individual cases show great variation and range from a dozen to more than 3,000 according to some dermatologists.

The different stages of lesions on the same patient and the distribution are important in differentiating chickenpox from smallpox as well as some of the other conditions occasionally causing confusion. These make a striking demonstration.

B. *Scarlet fever.* The use of color photography in this disease gives opportunity for detailed study of the various phases of the illness. The eruption, which in the close-up view reveals the punctate pin-point nature of the lesions with accentuation in such locations as axillae and inguinal regions, is exhibited; the Dick test and the blanching test give excellent photographs in color. Pressure changes in the skin are easily demonstrable and the throat and "strawberry tongue" can be photographed in color.

These results can all be compared with the cutaneous manifestations of seborrhea, certain drugs and toxins, some of which are very definitely scarlatinoid.

C. *Measles.* In this condition definite visual advantages are obtained. The grouping of the lesions, their configuration and distribution, the fading process and the final fine branny type of desquamation are all easily demonstrable. Comparing the photographic results in color to the usual black and white reveals the distinct advantages and the educational possibilities. Again the eruption can be compared to other types of morbilliform reaction as seen in rubella (German measles) and drug eruptions as KCNS (potassium sulphocyanate) which is used in the treatment of hypertension.

D. *Drug eruptions, Seborrheic dermatitis, Fungus and its cutaneous reactions, Herpes zoster, Molluscum contagiosum and other eruptions causing confusion in diagnosis.* All of us have seen skin eruptions from such commonly used medications as aspirin and at times they may result in a very doubtful diagnosis. Potassium sulphocyanate at times produces an eruption which may be diagnosed as measles; herpes zoster involving an extensive area on the chest may resemble chickenpox as can molluscum contagiosum in rare instances. Seborrheic dermatitis may imitate scarlet fever or pityriasis rosea and I have seen one case of arsenical dermatitis which could very easily be mistaken for German measles. Epidermophytosis and the sensitivity produced in the skin may cause confusion with one of the exanthemata, and taenia or pityriasis versicolor may mislead one.

Good colored photographs, taken under proper lighting conditions, can be of great assistance in teaching the fundamental diagnostic points by clearly demonstrating them visually. There is, in addition to this, an advantage which cannot be denied; the colored photograph is a permanent record which can be displayed at the choice of the possessor, which is considerably more than can be said of the eruption photographed!

*Eastman Kodak product.

The Problem of Acute Poliomyelitis*

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POLIOMYELITIS is known under the term acute poliomyelitis, acute anterior poliomyelitis, infantile paralysis, and Heine-Medin's disease. The condition may be defined roughly as an acute contagious disease which affects mainly the central nervous system and often produces distressing residuals of muscular paralysis of varying severity. It is caused by a virus and occurs strikingly in epidemics. These points will be elaborated in the course of the subsequent remarks.

The Clinical Syndrome

The first description of the clinical picture of poliomyelitis is generally traced to a book on the diseases of children written in 1784 by a prominent English physician by the name of Underwood. The description is very brief and suitable speculation exists as to whether it actually refers to poliomyelitis. In the fourth edition of his book in 1799 he gave a much more acceptable description of the condition but still showed a great lack of appreciation of what we now understand to be the diagnostic features. Certain references are found in ancient records and statuary that suggest the occurrence of poliomyelitis in ancient times, but other possible explanations of the abnormalities portrayed are just as logical.

Just a hundred years ago (1840) Jacob von Heine of Connstaat, Germany, published a monograph on paralytic conditions of the lower extremities and their treatment. His descriptions clearly referred to poliomyelitis but were limited mainly to the type in which only the lower extremities were involved. Our knowledge of the disease in terms of modern understanding may be said to begin with Heine's monograph.

The next real advance came in 1887 when Medin observed an outbreak of 44 cases in Stockholm. Previous to that time the disease had usually occurred in sporadic form but Medin now recognized the epidemic nature of the condition and saw a sufficiently large number of cases so that he could construct a really adequate description of the several clinical types.

Because of the contributions of Heine and Medin to our knowledge of poliomyelitis, the condition is often spoken of as the Heine-Medin disease.

The symptoms in the acute stage usually become pronounced within a matter of hours. Commonly the patient acts and feels as though he had a simple head cold; a running nose, a sort throat, a general feeling of tiredness and achiness are the usual beginning symptoms. This period may last a day or two before further symptoms occur, or new symptoms may appear very rapidly. Headache of severe and persistent type and stiffness of the back of the neck, especially on bending forward, become prominent. The patient generally has a low grade fever, up to 101 or 102 Fahrenheit. Then within a period of from a few hours to a few days, weakness in one or another of the voluntary muscle groups may appear in light or severe form. The lower extremities are most commonly involved though any groups of muscles in any combination may become weak. The weakness may stop at this point, or it may progress to absolute paralysis in certain of the muscle groups with weakness in the others or to extremely severe paralysis of nearly all of the voluntary muscles of the body. In these more severe cases it is common to have a paralysis of the muscles which move the chest wall and of the muscles of the diaphragm so that the patient develops inability to breathe. This is the most common cause of death in poliomyelitis. The paralyzed muscles become extremely tender to direct pressure, or to stretch from movements of the joints. In the vast majority of cases the temperature disappears within a week or ten days, the extension of the paralysis stops, and the patient enters upon the stage of convalescence. Usually tenderness of the muscles remains for an additional period of three to six weeks, however, and the stiffness of the neck and back for two or three weeks. In those muscle groups that are less severely paralyzed the return of strength is rather rapid and usually complete within two or three months. On the other hand, in the muscles that were severely paralyzed from the first, there is usually little tendency for any marked return of function during the first two or three months after the acute infectious period of the disease. Under good orthopedic care the maximum improvement is reached within one or two years and very little more can be expected in the way of improving the paralyzed or weakened muscles after that time. In those cases which have not been given continuous orthopedic care after the acute stage of the disease some improvement is possible even after several years have elapsed by appropriate support and exercises. Special operative procedures are used by the orthopedist by means of which functioning muscles are substituted for those that have become permanently paralyzed. Surgical correction of deformed joints is also an important part of the late treatment. This could be the subject of a complete lecture on poliomyelitis but really does not come within the present considerations.

During the period of acute infection the disease may become spontaneously arrested at any stage. That is, there are patients who have nothing more than evidences of upper respiratory and nasal infection, whose condition does not progress beyond that point. There are others who develop the signs of meningeal irritation, namely headache and stiffness of the neck and back, who do not develop paralysis. Cases of this sort are spoken of as abortive poliomyelitis. Because these people are not very ill and their cases are often not recognized, they are frequently not put into quarantine and doubtless become

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one of the major factors in the spread of poliomyelitis to produce epidemics.

Incidence and Epidemiology

The following epidemiological data as they refer to the state of Minnesota have been given to me through the courtesy of Dr. Orianna McDaniel, who is the director of the Division of Preventable Diseases of the Minnesota State Board of Health. Dr. McDaniel has permitted me to use graphs which were constructed in her division.

From 1915 to 1940 (25 years) there have been 6,724 recorded cases in Minnesota. The greatest incidence is after 1 year and before 5. Nursing infants are apparently protected by mother's milk. About 95 per cent of the cases occur before the age of 18 and only occasional cases are seen between the ages of 40 and 50. Practically none occur after 50 years of age. It is to be noticed that the total number of cases is a statement of the reported cases. Nobody knows how many nonparalytic and abortive cases of poliomyelitis occur, because some physicians report poliomyelitis of the nonparalytic types more or less on suspicion when they feel they have sufficient evidence to justify their diagnosis; others do not report poliomyelitis unless the patient is paralyzed. Our statistics on total case numbers are also unreliable on this account. It is probably true, though it cannot be satisfactorily proved by epidemiological statistics, that many more abortive, nonparalytic cases occur than paralytic or fatal cases. One might say, therefore, that poliomyelitis has a high infectivity rate but a low morbidity and a still lower mortality rate. Since infection by the virus, whether it produces severe or light symptoms, protects against subsequent infection, a good many more people thus develop an immunity against the virus of poliomyelitis than actually develop any serious form of the disease.

Since 1915 there have been 918 deaths in Minnesota from poliomyelitis, distributed by ages as follows:

Under 15 years	55 per cent
15 to 24 years	30 per cent
25 years and over	15 per cent

When one compares the average of 37 deaths annually due to poliomyelitis with the 644 deaths in the single year 1938 from automobile accidents in this state it is evident that the automobile is a much more serious problem from the standpoint of the community welfare and health than poliomyelitis. Considering these data, the casual way with which we accept the mortality and crippling results of automobile accidents compared with the severe emotional strains that we go through in times of poliomyelitis epidemics seems somewhat contradictory.

In Minnesota eight definite outbreaks of poliomyelitis in epidemic form have occurred since 1909. It is to be observed, however, that poliomyelitis occurs also in sporadic form; that is, isolated cases are with us in the state even during the non-epidemic periods. It is interesting to note that all of the epidemics have occurred with the maximum incidence in the late summer and early autumn, as far as this state is concerned. This is also the rule in other geographical areas but taking the world at large, there have been several epidemics which occurred in the middle of the winter. Even in non-epidemic years there is a slight increase in incidence of cases during late summer and early fall.

The close correlation between seasons of the year and epidemics has given rise to considerable speculation as to why this relationship should exist. The possibilities that flies are carriers during this time when they have their greatest frequency or that the weather favors the spread of poliomyelitis through water or milk, or by means of vermin such as mice and rats, or through their parasites such as fleas and lice, have all been suggested and studied. Some evidence exists to support each of these ideas. It is generally agreed, however, that the principal mode of spread is from ambulatory infected individuals (abortive cases) through droplet infection in coughing, sneezing and talking which contaminates the air that is breathed by the next person.

The incubation period in poliomyelitis, namely the number of days from the time of exposure to the disease to the first appearance of symptoms, is usually between six and fifteen days. However, an occasional case may not have its onset until three weeks after exposure.

The Changes in the Body in Poliomyelitis

This disease is characterized pathologically by several features.

The lymphatic glands of the body tend to be enlarged and inflamed. This indicates that there is a generalized infection.

The really significant changes occur in the central nervous system, that is, in the brain and spinal cord. The brain is not involved to any appreciable or any serious degree except in a few cases which are commonly fatal. Certain of the brain centers which have to do with the control of respiration and circulation are sometimes severely involved; these cases usually die within a few days after the onset.

The meninges, which constitute a thin membranous envelope over the brain and spinal cord, regularly show signs of inflammation in poliomyelitis. It is this involvement which accounts for the severe headaches, the nausea and vomiting and the stiffness of the neck which is characteristic of the earlier stages of the disease. Clinically, the meningeal involvement is confirmed by examination of the spinal fluid which shows an abnormal increase in certain types of free cells that escape into the spinal fluid in the course of the meningeal reaction.

The typical nervous system injury is found in the spinal cord in paralytic cases. The gray matter (especially the anterior horns) of the spinal cord is the seat of the most severe involvement. The anterior horns contain the nerve cell bodies whose processes run out into the peripheral nerves to initiate voluntary movement in the muscles of the body. When these cells are interfered with or destroyed, paralysis of the corresponding muscle groups occurs. Inflammatory reaction, more or less nerve cell destruction, and hemorrhages into the anterior horns of the cord are characteristic of the disease microscopically.

Not all of the anterior horn cells in a given involved area are destroyed but commonly many of them are simply interfered with temporarily in their functioning; this is the explanation for the clinical observation that during the first few weeks after the acute attack, many of the paralyzed muscles can return to functioning as the surviving nerve cells in the spinal cord area to these muscles again pick up their function. After this period the slow improvement is due merely to the fact that exercise causes the remaining muscle fibers to become larger and stronger, just as an athlete's muscles do with exercise. Obviously, this improvement can only progress to a certain limit beyond which no increase in strength becomes possible, excepting on the basis of surgical procedures which substitute the function of a neighboring unparalyzed muscle for the lost functions of the involved muscle.

THE MODERN PERIOD OF INVESTIGATION

Practically everything that has been brought out so far in this lecture, excepting for the statistics and data on epidemics and incidence of the disease, was known previous to 1909. The period up to that date is spoken of as the period of clinical and pathological investigation.

In 1909, however, Landsteiner and Popper in Paris succeeded in transmitting the disease to a monkey. The method was simple. They had obtained a specimen of brain and spinal cord from a child who had died at the height of the disease. They ground up pieces of the brain and spinal cord, added some salt solution of appropriate concentration, and injected the suspension into monkeys; the animals developed the typical disease. However, they were unable to produce the disease in a second group of monkeys by injecting similar material from the first animals.

A few months later Flexner and Lewis at the Rockefeller Institute for Medical Research in New York were able to carry the disease through serial transmissions in monkeys and now medicine had the virus available for work and study in the laboratory on the experimental animal. Several other investigators in different parts of the world quickly acquired the technique of Flexner and Lewis and intensive study of the laboratory disease began so that our knowledge of the characteristics of the infective agent accumulated with extreme rapidity. It was soon discovered that the virus in pieces of brain or spinal cord from infected animals could be kept for long periods of time in solutions of glycerine at ice box temperatures. The virus could be transmitted in glycerine from one laboratory to the other so that investigators had the opportunity of working with different strains of the virus, isolated from different parts of the world, and they could check one another's observations.

It was soon demonstrated that an animal which had recovered from an attack of experimental poliomyelitis was resistant to a subsequent inoculation. This confirmed the clinical observation that an individual who had recovered from an attack was immune to subsequent attacks.

Then it was shown that virus mixed with the blood or blood serum from a recovered monkey became inactivated so that it would not produce the disease. This technique of neutralization of the virus by convalescent serum has been subsequently used as a diagnostic procedure to demonstrate the incidence of immune individuals in the general population. *About 80 per cent of normal adults show neutralizing substances in their blood stream aganist poliomyelitis.* As suggested above it is assumed that this immunity has been acquired by an abortive or sub-clinical infection at some time in the individual's past.

Then it was discovered that a monkey treated with convalescent serum and injected shortly afterwards with the virus, was resistant to the virus; thus an injection of serum produces a passive immunity which lasts a short though somewhat indefinite period of time.

On the basis of these observations many attempts have been made to develop a practical means of immunizing human beings against poliomyelitis. For instance, mixtures of convalescent serum and virus have been injected into monkeys. If mixtures are used which will not occasionally produce poliomyelitis because of the overabundance of the serum, immunity is not produced. If the serum is reduced and the virus increased in proportion, then immunity is produced but the mixture becomes dangerous because an occasional animal develops the disease. Likewise many attempts have been made to treat the virus so as to devitalize it by means of such substances as formalin, aluminum hydroxide and in the case of our own experiments (Larson and McKinley), the sodium soap of castor oil, sodium ricinoleate. All of these methods produce immunity but likewise all of them produce the disease in an occasional animal. Consequently none of them are applicable to the human being.

Attempts to produce passive immunity by the injection of convalescent serum or the serum of the child's parents (80 per cent of adults are immune) during poliomyelitis epidemics have been made. The method is very cumbersome, rather expensive, and an enormous amount of work would be required to prove its efficacy. It has been used to some extent but it seems to be of limited usefulness and has not been followed up very considerably by the medical profession and health services.

Attempts to treat poliomyelitis by the injection of convalescent serum into the sick child or by transfusions of blood from convalescents to individuals who are developing poliomyelitis are theoretically entirely feasible and sound as far as the laboratory experience is concerned. In the human being, however, none of these methods has proved any more efficacious than the old symptomatic treatment that was used years ago. The trouble probably is that the case is recognized a bit too late; the treatment ought to come in the incubation period before the nervous tissue is invaded rather than at the onset of the disease.

Recently, in accord with the idea that droplet infection and spread of the infection along the olfactory nerves from the nose to the brain are the mechanism of infection of an individual, the attempt has been made to treat the nasal passages with certain cauterizing substances with the idea of producing a dam against the

spread of infection. However, rather distressing symptoms have appeared in some of these individuals after such treatment; they have sometimes lost their sense of smell and developed nasal complications. Again, since an enormous number of cases would have to be so treated in order to prove its efficacy, this method has generally been abandoned. Then, too, some workers believe that inhalation into the lungs or swallowing into the gastro-intestinal tract may really be the mechanism of invasion of the body by the virus.

In consequence, it is probably fair to say that at the present time we have no suitable method of specific control in the sense of an immunizing technique and no thoroughly satisfactory specific treatment after the disease once commences. This does not mean, however, that we are without any means of assisting in the control of an epidemic, nor that our symptomatic treatment and orthopedic aids are of no avail. Indeed, many excellent helps to the recovery of an individual are at present available. It does mean that although the specific methods for control and treatment seem to be tantalizingly nearby, still much more work will be needed before we can feel successful in a practicable approach to the eradication of this disease.

Poliomyelitis research is expensive. Monkeys cost from five to eight or ten dollars apiece and one laboratory will use several hundred animals annually. This, when added to the costs of the research assistants, attendants, and materials and equipment that must be available for the successful prosecution of experimentation in poliomyelitis, means that one laboratory would expend several thousand dollars annually in performing a very modest series of experiments.

This rather expensive experimental approach seems at the present time the most likely to yield results. We should not begrudge the annual expenditure of thousands or hundreds of thousands of dollars on this research when we think that millions are spent in the country yearly on the support and after care of our cripples and when we consider the heartbreak and suffering incidental to these tragedies. There is every reason to expect that the scientist will find a chemical (similar, for instance, to sulfanilamide against the hemolytic streptococcus infections) or an immunological technique for the successful prevention or treatment of this plague. Progress in understanding has been rapid since 1909 and the possibilities of solution of the problem have been by no means exhausted.

The Treatment of Uncomplicated Acute Alcoholism*

A Preliminary Report Upon the Effectiveness of Insulin, Glucose and Thiamin Chloride in Correcting the Pathological Physiology

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ABOUT two and one-half years ago we began to treat our acute alcoholic patients by methods directed specifically at their metabolic disturbances. It is our purpose to report upon the results obtained from the use of insulin, intravenous glucose, thiamin chloride and a high caloric diet in the treatment of simple, uncomplicated, acute alcoholism.

By "simple, uncomplicated, acute alcoholism" we mean the clinical syndrome found to result from the prolonged use of alcohol, in beverage form, and which has not as yet progressed to the stage of psychosis or neuritis. The simple, uncomplicated, acute alcoholic must be differentiated from the simple intoxicant who makes a spontaneous recovery after a night's "spree". The latter does not require medical attention for his alcoholism. All patients who do require and need medical attention during an alcoholic episode should come under the classification of "alcoholism". It is our purpose to deal only with the medical problems present at the time the physician is called upon to treat an acute alcoholic episode. Usually the physician is consulted because of either a behavior problem, or physical illness, or both. The former may manifest itself in many ways: viciousness, uncontrollable anger, continuous activity, and a refusal to stop drinking in the face of physical illness, depletion of funds, or a loss of position. Many physical symptoms may be found. These consist of nausea and vomiting, extreme nervousness with tremor, restlessness and insomnia, headache, ataxia, anorexia, and a general feeling of being "toxic". Various combinations of these symptoms may be seen which lead to various degrees of unreasonableness and physical debility. These states are seldom seen in persons under 25 years of age or in those who have done very little drinking in the past.

The past history is sprinkled with alcoholic episodes for several or many years. Usually it will be found that these episodes have become gradually more and more severe and more and more prolonged, but not necessarily more frequent. The patient has learned in his relation to alcohol that whenever he starts to drink he cannot stop without the help of friends, relatives, and sometimes physicians.

This is, of course, the usual history and symptomatology of the chronic alcoholic, the so-called alcohol addict. It is not our purpose to deny the psychological

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factors of this state, but we believe that there are physiological changes which lower the efficiency of the organism and its detoxifying abilities so that these states develop in an individual who previously did not show them while taking alcohol.

Puyuelo[1] discussed the various metabolic disturbances which develop in the chronic drinker. While he was approaching the problem from the standpoint of delirium tremens, we believe that it is logical to assume that these same changes are found to a greater or less degree in the patients described above, and that these patients are in a state that can be described as predelirium tremens. Connor[2] has pointed out that the type of liver cirrhosis seen in alcoholic patients results from repeated, periodic episodes of alcoholic abuse and accompanying malnutrition. During these periods the liver develops a state of fatty infiltration with replacement of glycogen by fat, which is followed by fibrous tissue infiltration into the areas that are most affected. Cirrhosis is the result of an episodic progression of these changes. Along the course the time comes when the liver becomes very susceptible to chemical and nutritional influences, and loses its ability to detoxify readily the blood stream of both endogenous and exogenous toxins.

Chambers[3] calls attention to the relationship between malnutrition and various changes, both structural and functional, in the several factors of carbohydrate metabolism. In every state of malnutrition with resulting structural change and biochemical dysfunction, the first object is to correct the pathological physiology. He emphasized the fact that in advanced malnutrition there is a suppression of insulin, and that insulin is vital to readjust the abnormalities quickly. Carbohydrates are also necessary in order that the metabolic processes may be carried to their ultimate end point with resulting readjustment of the physiology, and the reversing of the pathological condition which has developed.

The above processes have been discussed in detail in another presentation.[4] Simultaneously with our work on delirium tremens, we treated all admissions of acute alcoholism with small doses of insulin and large feedings of readily utilizable carbohydrates, such as fruit juices, by mouth. Approximately a year ago (fall of 1938) we began to give certain selected patients intravenous infusions of 10 per cent glucose, and recently have determined that the intravenous route is a better method of administering glucose, in that it can be more easily controlled and standardized. At the present time the use of intravenous glucose is the standard procedure.

This procedure consists of giving 500 to 1500 cc. of 10 per cent glucose intravenously daily until the acute stage has passed. Each 500 cc. contains 10 units of insulin and 10 mgms. of thiamin chloride. Additional insulin is given from time to time to control the symptoms. The patient is urged to drink large quantities of fruit juice which has been sweetened with glucose.

We have treated 186 individual patients suffering from acute alcoholism by re-establishing carbohydrate metabolism. There have been in this series 166 readmissions, making a total of 352 admissions or patient procedures. This group contained examples of all the acute and chronic alcoholic types.

Acute and chronic alcoholism is essentially self-limiting, in that if the intake of alcohol is cut off recovery will result. This problem does not lend itself to the exact statistical analysis of clinical results that most conditions do. Therapy is not specific, but is supportive and the objectives are to protect the patient until the psychotic manifestations of intoxication have disappeared; to restore the physical and physiological defects which have developed during the experience; and to make the patient as comfortable as possible during withdrawal or at the time of withdrawal.

In spite of the fact that there is apparently no valid physiological or pharmacological objection to sudden withdrawal, with or without support from sedative-like drugs, the patient is as a rule violently opposed to this procedure, and during the period when he feels the worst from the symptoms of toxemia he demands therapeutic help for the purpose of correcting and controlling the symptoms of headache, nervousness, tremor, malaise, irritability, weakness, etc.

There are valid objections to the use of the opiates, the barbituric acid derivatives, hydrotherapy and other drugs and procedures which have been in use in the past. A procedure which accomplishes the same results as those outlined above, yet does not have the objectionable features, should be very valuable if properly used. We have found that insulin and glucose will accomplish the results. All of our patients at the time of admission were suffering from a marked degree of intoxication. Many were uncoöperative. Most showed a marked degree of dehydration and malnutrition. There was usually a history of prolonged abstinence from food, both liquid and solid.

Immediately after admission, 20 units of insulin are given. The patient is watched carefully, and at the first sign of hunger liquid nourishment is provided. The problem of wanting spirits seldom comes up in the first few hours, but if the patient insists upon a drink he is given one. The patient may drop off to sleep shortly after admission, but the nap is usually short. He must be watched carefully, and if the intensity of perspiration increases he is aroused and urged to take liquids. As this increase in perspiration is evidence of a minor insulin reaction, the patient is usually hungry and cooperative. The second dose of 20 units is given three hours after the first. This almost invariably produces hunger, and the patient will take quantities of liquid food, such as orange juice, tomato juice, soup, and some may take light solids. After this meal, the average patient usually falls asleep and sleeps naturally for several hours. He may wake up nervous and want alcohol, but many feel that they do not need alcohol or any other sedative. Shortly after he awakens, he is given 500 cc. of 10 per cent glucose solution containing 10 units of insulin and 10 mgms. of thiamin chloride. This frequently controls all of the nervous symptoms, and produces complete relaxation. One or two subsequent in-

fusions may be given if conditions warrant them. Additional doses of 20 units of insulin are given at 6 and 9 P. M. of the second hospital day, and the patient usually sleeps well this night. The infusion is repeated the third hospital day, and on this day practically all of the symptoms have disappeared. The average requirement of whiskey per patient to keep him satisfied and content has been about 3 ounces from the time of admission to the time that all symptoms have disappeared. Convalescence from this point is uneventful.

The reasonableness of the use of insulin, glucose and thiamin chloride in the treatment of the simple, uncomplicated acute alcoholic is based upon our concept of alcoholism as a progressive disease affecting the whole body. As we conceive it, alcoholism is a disease with a chronic progressive pathological background characterized by successive acute pathological-physiological episodes which have primarily a nutritional background. Connor[2] pointed out that cirrhosis of the liver results from repeated states of malnutrition from alcoholic experiences. The malnutrition leads to a fatty infiltration with enlargement of the liver. At the time of each episode there is some destruction of liver cells with replacement by fibrous tissue. Over a period of years true cirrhosis has developed. Accompanying this pathological development there is a loss of function. The liver can take care of less severe emergencies. There are fewer functioning and storage cells and there is less glycogen stored to meet the needs of the organism and carry it over periods of malnutrition. This breakdown of liver function and lowered efficiency is responsible for the rapid intoxication both from alcohol and metabolites seen in the periodical "drunkard". Klemperer,[5] Puyuelo,[1] Robinson[4] feel that it is the breakdown of liver function leading to the free circulation of intermediate products which is responsible for the pathology in the brain which produces the symptoms known as delirium tremens. Glycogen reserves must be replaced if the liver is to be made effective again so that it can detoxify the body and eliminate the cause of the symptoms. Body insulin is suppressed, and insulin is necessary if glycogen is to be stored in the liver. Insulin, glucose and thiamin should be given. When this is done the liver takes up its function almost at once, and the various poisons that have accumulated and which are responsible for such secondary symptoms as insomnia, nervousness, irritability, tremor, headache and many others will soon clear up. At the time that the physician is called to see the alcoholic, alcohol has become actually distasteful, but the patient feels that he cannot be without the sedative effect of the alcohol in order to control these symptoms. Correcting the cause of these symptoms makes any sedative unnecessary. In our series of 352 admissions of private patients, only 10 have had to have any form of sedative drugs.

Over one-half of our cases had very little if any thiamin chloride. We have found that the addition of thiamin chloride to our original procedure of insulin and glucose, either by mouth or intravenously, has not increased the effectiveness of the method materially. However, as thiamin is the enzyme which makes tissue utilization of carbohydrate possible, we give rather large doses in the early acute states. We doubt if these doses need to be as high as we have been using, and plan to reduce them in the future. The healthy organism needs only one to two mgms. of this substance per day, and theoretically this should be all that is needed in the treatment of deficiencies providing it is made available to the tissues and glucose and oxygen are also present. Injected insulin, thiamin chloride and intravenous glucose make all of the vital factors available to the various tissues so that reconstruction with relief of symptoms rapidly ensues.

Goldfarb, Bowman and Parker[6] reported upon the use of 50 per cent glucose and insulin in the treatment of acute alcoholism. They report an acceleration in the rate of decrease of blood alcohol following the administration of these two substances, which is more marked than that seen in the three control series which were given respectively neither, insulin alone, and glucose alone. They noted more clinical improvement in their patients who received insulin and glucose than they did in those of the other three series. The results are attributed to the increased oxygenation of the alcohol catalyzed by the simultaneous oxidation of the glucose.

Siegmund and Flohr[7] ran a series of carefully controlled experiments upon three apparently healthy men. They tested the effect of insulin upon the rate of removal of alcohol from the blood stream. Their material is presented in great detail, and they conclude that insulin is not useful as a sobering medicine. Their experiments covered a period of eight hours from a single large alcoholic intake, and they did find that blood alcohol levels are lowered more speedily with insulin than without it. Another interesting feature that they found is that blood alcohol levels did not fall regularly when insulin had been given, but there were periods in which the alcohol rose above the control levels. They attributed this to delayed absorption. They warned against the procedure due to the rapid fall in blood sugar, and said that their work contradicted Bickel's[8] experiments, who felt that insulin was a distinct aid in reviving intoxicated rabbits. These experiments, however, seem to us to have little bearing upon the clinical use of insulin and glucose as advised by Goldfarb and associates, and by us. They gave their experimental subjects 40 units, and produced a marked fall in blood sugar, which undoubtedly depleted the liver of its glycogen. Their subjects were not suffering from malnutrition and, therefore, could not be intoxicated from secondary metabolites which, as we have pointed out above, Klemperer,[5] Puyuelo,[1] and Robinson[4] believe are responsible for the symptoms of delirium tremens, and which we believe are responsible for many of the symptoms of the "uncomplicated" alcoholic. We believe that the large doses of insulin with accompanying hypoglycemia deplete the liver glycogen and interfere with its function. This factor must have influenced their results, although it is not mentioned in their report. Clinically we use small doses of insulin, 15 to 20 units, and give plenty of glucose. With a depleted liver these small doses of insulin will restore the liver glycogen and eliminate the metabolites. The effect

upon the blood alcohol we consider incidental, because we consider that the distressing symptoms are due to the secondary toxins.

This procedure requires careful, intelligent nursing and medical care if complications are to be minimized. It has been our experience that patients with liver damage are very sensitive to insulin and very easily and quickly develop insulin shock if they are not watched carefully. In spite of our watchfulness, six patients, 1.7 per cent of our entire series, have had severe insulin reactions. Five of these have been convulsive, and one was of the excitement type. Four of these "shocks" developed when the blood sugar was at a normal or above normal level immediately after a meal or an infusion. All six came on without a preliminary warning, such as tremor, perspiring, hunger or such other symptoms as would indicate an insulin reaction. None of the patients suffered any ill effects, and none were alarmed by the reaction. Mild reactions with perspiring, tremor, hunger, etc., are very beneficial, for as soon as they are corrected the patient quickly falls asleep and sleeps well for several hours, awakening clear-headed and in a relatively excellent condition. Goldfarb and associates reported this phenomenon of mild reaction in those cases with a relatively low blood sugar but without comment as to its effect upon the clinical course. They were stressing the effectiveness of the procedure upon the comatose or pre-comatose type patient. This it not the usual problem in private practice. Rather we see more of the agitated type of patient. A sedative effect is very desirable in the majority of our cases.

A few of our patients when given too much insulin have developed confusional states, which were quickly corrected by glucose. We believe that this results from a hypoglycemia with reduction in the amount of glucose that is available to the brain.

While these complications may seem severe, developing as they do in such a condition as alcoholism, we believe that they do not contra-indicate the procedure. All other methods which have been proposed are either of themselves toxic, weakening, disagreeable or frankly dangerous, and are purely symptomatic in their approach.

The great majority of our patients have liked the procedure and have felt that it has accomplished its purpose quickly and easily. Most alcoholics have had a variety of medical care. Their statements about a certain procedure should be given considerable weight. There is nothing about this procedure, when given for a short period, that will achieve any permanent results. We have worked with some coöperative patients over a period of time with these methods, and will make a later report as to our results. Most alcoholics relapse, and the fact that so many of our patients, most of whom admit themselves voluntarily, have returned for this procedure is an indication that the patients like it.

This procedure cannot be routinized or standardized. Every case is an individual problem and must have watchful medical attention. Each dose of insulin and each infusion should be given only after the physician has seen the patient, studied the clinical condition, and ordered the dose. We believe that four of our "shocks" probably could have been avoided if we had been able to apply our accumulated experiences in the early days of this treatment method. As we develop the procedure fully, we find that most of the severe complications can be eliminated.

Conclusions

1. Acute, uncomplicated, simple alcoholism is a medical problem and should be treated by correcting the pathological physiology and biochemistry, rather than symptomatically.

2. The disagreeable symptoms, or those of a behavior type, are due to a breakdown of carbohydrate metabolism in its several phases, as well as to the prolonged, excessive intake of alcohol.

3. Insulin and glucose, either by mouth or intravenously, with small amounts of thiamin chloride is the best and quickest method of readjusting carbohydrate metabolism and quickly relieving the patient of his symptoms.

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IMPETIGO OF THE NEWBORN INFANT

Impetigo still appears at some time during the year in practically all hospitals, although nursery technique is being continuously improved. Wherever it strikes, the routine care of the newborn is immediately disrupted. The special care of the infected infant and the thorough cleaning of the nursery places a great burden on the personnel of the maternity section of the hospital. The infant with impetigo is isolated and not allowed to nurse at the mother's breast; this upsets the mother. The words "impetigo in the nursery" are passed on rapidly and added to this is the rumor that it is spreading fast. Although this is usually not true, occasionally the impetigo does spread rapidly, and a number of infants become well covered with the lesions.

What have we done to reduce the infection and eliminate the disease? Nurseries have been rebuilt adding modern conveniences thereby making it possible to simplify the care of the infant. Improved nursery technique has been adopted. It demands that anyone entering the nursery first scrub his hands similar to the preparation necessary for a surgical operation; second, wear mask and gown while in the nursery taking care of an infant; third, use antiseptic solutions between handling of each newborn; and fourth, avoid excessive handling of the infant during the bathing procedure. The infant is weighed less frequently, thus avoiding exposure. Another precaution is sterilization of all linen.

The fact that impetigo occurs despite these precautions is very discouraging to those who strongly advocate strict isolation technique in the nursery. They must remember, however, that there are three possible sources of contamination of the newborn which must be considered. These are: (1) breaks in technique by those individuals entering the nursery for only a short period of time, (2) exposure of the infant while he is being taken

through the corridors of the ward to be nursed, and (3) contact of the infant with materials in the mother's room which have been contaminated by visitors.

The first factor can be eliminated if each physician and member of the hospital personnel does not go into the nursery unless he or she is properly prepared to do so. The second factor can be taken care of by keeping the nursery carts holding the infant bassinets covered with clean sheets when they are going through the corridor.

The third is the greatest problem and the one now considered by many investigators as the only cause of impetigo. Not until the visitors to the maternity ward are greatly reduced in number will impetigo be an insignificant factor in the newborn nursery. The staffs of hospitals must agree to the restriction of visitors and then submit this agreement to superintendents so that definite rules can be established. This plan would be more effective, of course, if all hospitals in each community followed the same set of regulations.

A. V. STOESSER.

THE LIKABLE PHYSICIAN

We may not always be able to give a reason why we like a person, but it is quite certain to depend upon some favorable experience. The longer the acquaintance has been, the more likely it is that we have become familiar with the person's good qualities. If these met with our approval, we learned to like him whether or not we could relate in detail exactly how it came about. He may have expressed views of which we approved. He may have stood for principles against heavy odds. He may have befriended us when we needed help. He may have done big things and little things in a great number of ways that endeared him to us. We learned to lean upon him in trouble, to seek his guidance in perplexity, his help in adversity, and to depend upon him at all times.

It is qualities such as these that patients find in their physician. They trust him and seek his counsel because of them. Their confidence grows through years of undisappointed relationship. They become accustomed to leaving their problems to him with a feeling of assurance that they will be cared for. It is a priceless asset, this, that in the practice of every physician there should be a following of so many who believe implicitly in him and who like him.

A. E. H.

Book Reviews

Headache and Head Pains, by WALTON FOREST DUTTON, M.D.; 282 pages; Philadelphia: F. A. Davis Company: 1939.

This book is written as an encyclopedia of all types of head pain. While the idea of such a monograph is probably good, the reviewer does not feel that this volume adequately fulfills the purpose for which it was written. The prescriptions given use codiene accompanied by salicylates or phenacetin for almost every type of headache discussed. It seems superfluous to have so many of these prescriptions repeated throughout the volume. Among the notable omissions are the peculiar reference of head pains resulting from involvement of the various groups of sinuses. With revision, this volume in the future might become a valuable addition to existing medical literature.

Diseases of the Gall Bladder and Bile Ducts, by WALTERS and SNELL; 602 pages; Philadelphia: W. B. Saunders Company: 1940.

This volume is another in a series of Saunders Monographs written by two of the country's foremost authorities on the subject matter contained therein. With Dr. SNELL considering the medical phases and Dr. WALTERS the surgical aspect and with help from other colleagues at the Mayo Clinic, these men have produced a most worthwhile volume. When one disregards the knowledge that the book has been so authoritatively written and more closely peruses the contents, one is immediately struck by the conciseness of presentation and the clearness with which the material is presented. All phases of the subject are thoroughly covered and the volume is certainly to be recommended as a source book for those interested in biliary diseases. Perhaps gastroenterologists would be the ones to use it most, but it certainly must also be recommended for general practitioners who usually see most of these problems first.

Symposium on Blood and Blood-Forming Organs; Madison: University of Wisconsin Press: 1939. Price $3.50.

This book represents a collection of all the papers read at the Institute for the Consideration of Blood and Blood-Forming Organs held under the auspices of the University of Wisconsin Medical School in September, 1939, and made possible by funds contributed by the Wisconsin Alumni Research Foundation.

Various aspects in the field of hematology are covered thoroughly by the following outstanding investigators: E. Meulengracht, Cecil J. Watson, C. P. Rhoads, Clark W. Heath, George R. Minot, Louis K. Diamond, Russell L. Haden, J. Furth, Claude E. Forkner, E. B. Krumbhaar, Charles A. Doan, Hal Downey, Paul Reznikoff, Edwin Osgood and Harry Engle.

This work should be of great value to every physician interested in diseases of the blood and blood-forming organs.

Fractures, Dislocations, and Epiphyseal Separations, by HARRY C. W. S. DEBRUN, M.D., F.A.C.S., Adjunct Professor of Surgery, New York Polyclinic Medical School and Hospital; 468 pages with 150 illustrations; Chicago: The Year Book Publishers: 1940. Price $3.00.

This is a concise, well written outline of fractures, dislocations, and epiphyseal separations which will prove to be a valuable handbook for general practitioners and especially for interns and surgical house officers. It is obviously not intended for those specializing in the treatment of fractures or orthopedics.

The material is presented largely in outline form. In most cases several forms of treatment are listed, i. e., in fractures of the os calcis four methods are described. Yoerg's procedure is unfortunately omitted. Forcible hyperextension methods of reducing compression fractures of the lumbar spine are also omitted. There is no mention of the use of vitallium for the internal fixation of fractures.

Illustrations and roentgenograms are of necessity limited in number. The illustrations of the fracture equipment set-up will prove valuable ready references for interns and surgical house officers. There is a short chapter on physiotherapy and a valuable discussion on the roentgenological diagnosis of fractures is included.

Societies

TRANSACTIONS OF THE MINNEAPOLIS CLINICAL CLUB

Stated Meeting
Thursday, April 11, 1940
The President, James K. Anderson, M.D., in the Chair

SLIPPING OF THE UPPER FEMORAL EPIPHYSIS
(Inaugural Paper)

John H. Moe, M.D.

The problem of epiphysiolysis, or slipping of the upper femoral epiphysis in adolescence has not been solved. Since John Albert Key, in 1926, presented his thesis on this subject, a volume of literature has developed, mainly concerned with methods of treatment. On the whole, the end results have been unsatisfactory, and no one method of treatment has met with any remarkable success.

The problem is not one of a simple traumatic separation of an epiphysis. Henry Mitch has suggested the term "epiphyseal coxa anteverta" as a descriptive name. Certainly the more common term "coxa vara" is inadequate.

It is a condition for which no reasonable cause can be found. Theories of endocrine dysfunction, circulatory disturbance, and traumatic or static changes have been advanced among many others, but none is a satisfactory explanation. All that we know is that in early adolescence, with or without trauma, the head of the femur loosens at the epiphyseal line and displaces, first posteriorly, then distally, leaving the neck anteriorly and upwardly displaced. The displacement may be very gradual or quite sudden. Symptoms are produced in all cases, varying from pain and stiffness of the hip with limitation of internal rotation, to fixation of the hip in external rotation and with shortening. In early cases the symptoms are very mild.

In an average case, when one looks at the hip through an anterior approach, one is amazed at the difficulty encountered in visualizing the head. The neck presents itself, and usually the old epiphyseal line can be identified, but the head lies far posteriorly, and frequently even the cartilaginous margin is hard to see.

The condition, then, is a posterior and downward displacement of the capital epiphysis. Traction may overcome the coxa vara but will not correct the anteversion of the neck. Manipulation usually fails to correct this also, except in occasional acute cases. Operative restoration sometimes leads to aseptic necrosis of the loosened head.

The condition is not infrequently bilateral. Where it is known to exist in one hip, an extremely close watch must be kept on the opposite side in order that the early findings will not be missed. In recent years, more and more reports of treatment are being based on recent, early cases, with an increasing degree of successful treatment. It behooves us to diagnose this condition early and to treat it without delay. The use of the lateral view in X-ray studies of the neck of the femur has been the means of arriving at an early correct diagnosis.

A "pre-slipped" stage was frequently spoken of until very recently. We now know that the widening and irregularity of the epiphyseal line in this "pre-slipped" stage was due to the anteversion of the neck and was not an actual finding. In other words, the epiphysis was already displaced, although this could not be seen on the antero-posterior view. It is agreed that when a diagnosis can be made when there is a minimal amount of displacement, that adequate treatment leads to an excellent result. This treatment should aim at hastening ossification of the epiphyseal line and at the same time preventing further displacement. This may be done by one of two methods: either by making multiple drill holes through the epiphyseal plate or by the insertion of a Smith-Peterson nail. The drilling is simple and safe. Further displacement can be prevented by traction in internal rotation. The Smith-Peterson nail is an excellent alternative and is inserted in the same manner as for a fracture of the neck of the femur.

Adolescent Epiphysiolysis
Gillette Hospital Series: 44 Patients; 51 Hips

Unilateral	38
Bilateral	7
Trauma preceding	17
No trauma	28
Duration of symptoms before treatment:	
Over 1 year	29
Under 1 year	20
Sex	Male, 36; Female, 9
Average age	Male, 14; Female, 12

The same type of treatment is applicable in another group of cases in which the slipping may be termed "chronic". Here the deformity is slowly progressive, and the head on operative exploration appears thinned and widened. The thinned cartilaginous edge is indefinite, and if one attempts to remove the head for the purpose of replacement, it is found to be only a thinned and broadened shell. In this group, replacement of the head by manipulation or by osteotomy meets with failure. The treatment of choice, therefore, is drilling of the epiphyseal line. Since these types cannot be exactly diagnosed by X-ray examination, it would seem preferable to explore the hip and drill under direct vision. It must be remembered that in these cases one must accept the existing condition, knowing that the deformity will persist and that the end result will be a somewhat deformed head.

Unfortunately, most of the cases of epiphysiolysis show rather marked slipping and do not present themselves for treatment until some months have elapsed. A choice of three types of treatment may be made, namely: traction, manipulative reduction, or open reduction.

Strong traction over a period of many weeks or many months will result in improvement in the coxa vara, but will usually not improve the posterior displacement of the head to any appreciable extent. This is the method of choice of Watson-Jones, who stresses the avoidance of further trauma in this treatment. A tilted bed with a freely sliding upper platform on which the patient lies, permits strong, continuous traction.

Manipulation of the hip, as for a fracture of the neck of the femur, undoubtedly results in improvement in a great many cases. In the days before lateral X-rays were taken, improvement was noted in nearly every instance on the postoperative X-ray, but this was only apparent, and was due to the position of internal rotation. On removal of the cast the position of the head was frequently unchanged. It is probably the best judgment to concede that manipulation is worthy of trial. However, extreme force is not indicated, and it is imperative to check carefully the position of the head with antero-posterior and lateral X-ray views before applying a cast. If improvement is not satisfactory after a reasonably forceful manipulation, another method of treatment must be decided upon.

Operative procedures are fairly numerous. Philip Wilson has obtained good results by fixation with a Smith-Peterson nail after reduction. Ghormley describes a wedge osteotomy which has proven successful. The following method was devised by Wallace Cole and has been used by him and by myself with fairly excellent results to date. It is planned on the assumption that internal fixation is apparently not necessary in order to allow early motion to the hip.

The operation is done through an anterior approach. It is often necessary to cut the origin of the rectus femoris to gain adequate exposure. The margin of the displaced head is ascertained and with a curved osteotome or wood cutters tool, a curved osteotomy is done along the epiphyseal line. The tendency to make the cut too far proximally and to remove only a thin shell of head should be guarded against. After the osteotomy is completed, the head is placed in its proper relationship to the neck, using a Murphy skid. The position of internal rotation and abduction maintains this position.

A hip spica cast is applied for two weeks, following which the leg is placed in traction, keeping the position of wide abduction and internal rotation. In another week the physiotherapist makes daily bedside visits and motion of the hip is begun, still

Treatment of Epiphysiolysis in 659 Patients

	No. Cases	Good (%)	Fair (%)	Poor (%)	Bad (%)
Manipulation	207	33	24	26	17
Operative correction	62	30	17	29	22
Drilling	6	100	—	—	—
Wedge osteotomy of neck	6	33	33	16	16
Rest and physiotherapy	19	61	22	11	6
Arthroplasty	15	—	6	20	78
Extension and Rest	10	40	60	—	—
Sub- or trans-trochanteric osteotomy	12	33	16	16	33
Plaster bandage	19	53	16	31	—

(Adapted from Poul Lutken, Acta Orthopaedica Scandinavica 10, 1939).

Gillette Hospital Series: 44 Patients; 51 Hips
Results of Treatment

Type of Treatment	No. Cases	Excellent (%)	Good (%)	Fair (%)	Poor (%)	No Follow-up (%)
Manipulation	24		29	29	25	16
Traction	9		66	22	11	
Open reduction without internal fixation	5	20	60	20		
Drilling of epiphysis	5		80	20		
Osteotomy, neck of femur	1				100	
Gant osteotomy	1			100		
Rotation osteotomy	1		100			
S. P. Nail	1				100	
Arthroplasty	1			100		
No treatment	3		100			

keeping the hip in the same position. Traction and internal rotation are maintained for about six to eight weeks, with progressive exercises. Motion of the hip is frequently very free at this time. When bony union of the epiphyseal line is fairly well established, weight bearing is permitted, protected by a ring caliper splint.

The end results of treatment cannot be determined for many years. Deformity of the head is a fairly constant sequel, and late arthritic changes are common. It would seem that with early diagnosis and treatment, these late changes should be largely prevented. Successful operative replacement of the head should also make late complications less common. It would seem that normal hips may be expected only in early cases with a minimal amount of slipping, or in some of the cases in which open operative replacement of head has been made.

Discussion

Dr. Myron O. Henry: First I want to congratulate Dr. Moe on this nice presentation. He has been fortunate in seeing several cases in the pre-slip stage; I have seen only a few, but I have seen enough to make me cautious of a mother's diagnosis of a "sprained hip" or "growing pains." A child that has either of these complaints, or a slight limp, should be X-rayed with this condition in mind because it *does* occur often enough so it should be looked for with these complaints.

As Dr. Moe stated, in the early stage these cases can be manipulated back into position. The old treatment was to manipulate them and leave them in casts—unpleasant and expensive, or to put them in traction. My experience with traction has been that it is unsatisfactory and that they frequently slip back even in traction. I have a little different method of treatment; I reduce them if early, and instead of open operative fixation or drilling them I fix them with multiple pins from the lateral side. The multiple pin method traumatizes the head less than the Smith-Peterson nail, but any of these internal fixation methods that are carefully done are satisfactory so long as closure of the capital epiphyseal line obtains. The family should be warned that there may be a little shortening. We know that most of the growth occurs in the epiphyses about the knee, but because there is a *little* shortening to be expected, the parents should be forewarned of it.

Dr. John F. Pohl: I would like to thank Dr. Moe for the privilege of hearing this excellent and comprehensive paper on a subject which has been most difficult. There is little real information to add, but I should like to say a few words about the occurrence of the condition to point out possible leads in understanding the cause.

In the first place, the epiphysis slips at a definite period in life, usually around the age of puberty, at a time when profound physiological changes are occurring in the organism. If trauma were a factor of importance the slipping could just as well occur at other ages. A second point is the discrepancy in the sexes. In Dr. Moe's series the condition was found four times as frequently in boys as in girls. Some authors have reported an even greater preponderance. This might suggest a relationship to some glandular function.

Oddly enough, although the condition is infrequent in females, the disorder is apt to occur in the effeminate type of boy, that is the Froelich type with the excessive fat, broad hips and hypogenitalism. In spite of these obvious clues to an understanding of the underlying causes, very little information has come from a study of the cases. Neither metabolic or chemical alterations have ever been proven to be invariably present in the condition. Possibly we have no sufficiently adequate means of studying glandular function in the body as yet to give this help.

In regard to treatment, I should like to say in confirmation of Dr. Moe's statements, that those cases with advanced degrees of displacement are most discouraging. Certainly we should

try to get the case early in order to try to prevent further slipping. My own experience, although small, has almost inclined me to not attempt treatment where the epiphysis has slipped completely off the neck.

Dr. John H. Moe: I do not believe there is very much more to say as the points I did not cover are very well covered in the discussion. The incidence of the Froelich type of individual in this series I went through at Gillette was not very remarkable. I did not put down the analysis in the summary but roughly, I would say that about one-fourth were of the Froelich type and three-fourths were apparently in normal appearing individuals, so the endocrine angle in this series was not outstanding. Nevertheless, there must be something, of course, that produces this condition, and that is one of the theories that seems to hold up as well as any.

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SOME CLINICAL AND SURGICAL CONSIDERATIONS OF PRIMARY BRONCHIOGENIC CARCINOMA

(Inaugural Paper)

Thos. J. Kinsella, M.D.

Primary bronchiogenic carcinoma, once considered a rare clinical and pathological entity is now seen with sufficient frequency to challenge the interest of most physicians engaged in general work and even some in the very limited special fields. It is one condition which is not only being recognized more frequently but is apparently occurring with considerably greater frequency now than it was even some twenty years ago.

Historical

The earliest historical record of the condition apparently is to be found in the writings of Agricola, 1521-27 and 1456, describing a disease later proven to be primary bronchiogenic carcinoma affecting the miners of the Schneeberg area in Saxony. Credit for the first pathologically proven case must go to Morgagni who in 1761 in "De Sebibus et Causis Morborum" described a case of "ulcus canrosum" of the lung. In 1810 Bayle first reported the occurrence of bronchiogenic carcinoma and tuberculosis in the same patient. Laennee later differentiated these two conditions and his work later enabled Bell in 1846 and 1847 to make the first clinical diagnosis of a primary lung tumor, although it was eventually proven to be a sarcoma. Pathologically the histologic studies of Rokitanski and Virchow aided in the differentiation of this from other pulmonary conditions. The monograph of Adler in 1912 with a listing of 374 cases, was the first American contribution on the subject and served to center attention on this condition and its importance in clinical medicine. Since that time many publications have appeared on the subject and great strides have been made in both diagnosis and treatment. The recent monograph, *Primary Carcinoma of the Lung*, by Edwin J. Simons, is an excellent book containing a wealth of material on the subject from many points of view.

Incidence

Primary bronchiogenic carcinoma is one condition which from all reports has shown consistent and progressive increase in frequency for many years. Considerable controversy has arisen as to whether this increase is real or only apparent and the result of better diagnosis and clinical study. Certainly better diagnostic methods, more frequent use of X-ray, bronchoscopy and a better realization of the picture presented by this condition have led to a more frequent clinical diagnosis, but the increase has likewise been evident in series compiled from postmortem examination both in this country and abroad. This incidence has increased from a rather rare occurrence below 0.25 of all autopsies to approximately 1 per cent in the more recent reports. Barron in 1922 reporting from the pathology department of the University of Minnesota cited an increase from 0 in the period 1899-1911, to 0.9 per cent in the period 1918-1921. Similar changes have also been reported elsewhere. During the same period the condition has increased from approximately 1 per cent of all carcinomas found on postmortem examination to nearly 10 per cent.

Compared to carcinoma in other portions of the body, primary bronchiogenic carcinoma is a disease seen most frequently past the middle period of life, yet it may occur at almost any age, with cases reported from the age of 5½ months to 91 years. It occurs most frequently in the decade between 50 and 59, next between 60 and 69 and then the period 40 to 49, with these three decades covering 80 per cent of all reported cases. It does, however, occur frequently enough among younger individuals so that it must be considered in the differential diagnosis in any unusual lung condition. In the past two years I have seen two pathologically proven cases of primary bronchiogenic carcinoma in patients under 20 years of age.

Males are apparently affected about four times as frequently as females. Race and color and geographical location seem to play little part in the development of this condition. Occupation, likewise, seems to have little to do with the general incidence of the disease, except in the Schneeberg and adjacent mining fields where exposure to arsenic containing radio-active mineral dust has been associated with a very high incidence of this primary tumor.

Clinically primary bronchiogenic carcinoma is not a rare disease, being roughly of about the same order of frequency as carcinoma of the rectum, the uterus or esophagus. It should, therefore, be seen in almost every hospital in the country. The fact that it is not so diagnosed can only be that clinicians are not thoroughly familiar with the condition or that it is obscured by fluid or secondary suppuration which overshadows the underlying cause. The occurrence of primary bronchiogenic carcinoma in the local hospitals is of some interest. At the Minneapolis General Hospital from 1935 through 1939 twenty cases of primary bronchiogenic carcinoma were diagnosed from a total of 63,936 admissions representing one case of primary bronchiogenic carcinoma to 3,197 admissions. At St. Mary's Hospital, Minneapolis, from 1935 to 1939 there were fourteen cases of primary bronchiogenic carcinoma diagnosed from 26,301 admissions, representing one case to 1878 admissions. At Glen Lake Sanatorium, where all cases accepted for admission are at least tentatively diagnosed as possessing a tuberculous lesion, over the period from 1916 to 1939, seventeen cases of primary bronchiogenic carcinoma have been diagnosed from a total of 6,343 patients, excluding all re-admissions, representing one case of primary bronchiogenic carcinoma in 373 patients. Of this group nine patients had some type of tuberculous lung lesion, while eight presented no associated tuberculous disease. Of those who presented tuberculous lung lesions as well as carcinoma two had Gohn tubercles, three presented inactive, non-clinical or healed pulmonary tuberculosis, while four presented pulmonary tuberculosis with some evidence of activity, such as cavity, positive sputum and so forth.

Etiology

Many causes have been listed as possible factors to explain the development and increase of primary bronchiogenic carcinoma including influenza, tuberculosis, smoking, inhalation of dust, of tar particles, exhaust from gases from automobiles, radio-active materials, etc. None of these have been conclusively proven as a causative factor in the development of primary carcinoma of the lung aside from the known association of chronic irritation with the development of cancer. The inhalation of arsenic and radio-active mineral dust in the Schneeberg mines associated with an extremely high incidence of primary bronchiogenic carcinoma in this group of individuals strongly suggests an etiological factor for this group alone, but, of course, throws no light on possible causes of the condition in other areas or occupations. Similar findings of Pirchan and Sikl in the uranium miners of Joachimstal, Czechoslovakia, some 50 miles from Schneeberg, confirm the above findings. In this group of 400 deaths among miners over a two-year period only 17 were from natural causes and of these 9, or 53 per cent, were from primary carcinoma of the lung.

Pathology

Pathologically there is still considerable confusion in reported cases concerning the various types of tumors seen and even some discussion as to whether some of these tumors are benign or malignant. It is now quite definitely established that all primary carcinomas which originate in the lung are bronchiogenic in origin. Perhaps the simplest classification for practical clinical use is to divide these malignant tumors into an undifferentiated and a differentiated group. There may still be some questions in the undifferentiated group as to whether some of these tumors are primary carcinoma or sarcoma from a pathological standpoint, but from the clinical point of view this is not particularly important. The differentiated types of tumors may be divided into a squamous type and an adenocarcinoma type, depending upon the type of the epithelial structure seen. There is at times much confusion as to whether a given local tumor is a benign adenoma or a low grade adenocarcinoma. Certainly the diagnosis is frequently difficult, particularly when it must be established from a small biopsy fragment and where infection and metaplasia of broncihal epithelial further confuses the picture.

Dispute is also found among pathologists as to the relative malignancy of tumors developing in the hilar region in the larger bronchi and those developed more peripherally in the parenchyma of the lung. Many feel that those of peripheral origin are more malignant and less favorable from the surgical standpoint than those arising in the larger bronchi. The opposite view, however, may be found in other articles. Personally, it is my impression that the degree of differentiation of the tumor, the degree of malignancy and the time which it has been growing are of more importance clinically than its peripheral or central point of origin. All tumors developed in the larger bronchi may, by causing obstruction, produce symptoms early, while a tumor developed peripherally may grow to a considerable size and be present for a longer period of time without causing symptoms.

Because of the extremely rich blood and lymphatic supply of the lung, metastases occur from these tumors very readily. At times symptoms produced by metastatic deposits in the brain and other organs may lead to the discovery of an asymptomatic primary bronchial tumor. Because these malignant tumors tend to metastasize quite readily and frequently rather early delay in diagnosis and institution of treatment may be extremely important from this standpoint.

The possibility of metastatic tumors in the lung must always be considered in differential diagnosis before undertaking surgical treatment. Hypernephroma which occasionally gives a solitary metastasis or even bronchial wall involvement is especially prone to lead to confusion.

Metastases from primary bronchiogenic carcinoma are seen most frequently in the regional lymph nodes, next in the liver where they may form huge masses, third in the lung on the same or contralateral side, fourth in the bone, fifth in the kidneys and adrenal, then the pleura, brain, pericardium, pancreas, cervical nodes, heart, thyroid and spleen, in approximately this same order. The massive size of the liver metastases not infrequently suggests that the primary site of the malignant tumor is in some organ below the diaphragm. Metastatic tumor to the brain from bronchiogenic carcinoma have repeatedly been operated upon as a primary cerebral tumor. Metastases to the kidney, adrenal, pancreas and thyroid has repeatedly been mistaken for primary tumor of these organs. The erosion of an apical primary cancer into the adjacent rib or vertebral body with interruption of the sympathetic nerve trunk and infiltration of some of the branches of the brachial plexus (Pancoast's tumor and syndrome) has even been described as a separate entity, supposedly arising not from the lung but from a residue of one of the branchial clefts. Most of these are now recognized as primary lung tumors although an occasional one is metastatic.

Symptoms

The clinical picture presented by primary bronchiogenic carcinoma is extremely variable depending to a considerable degree upon the size of the tumor, its location and relation to other structures, the presence or absence of metastases and the development of secondary inflammatory changes. From a statistical standpoint Simons in a collected group of 1456 cases compiled the following list of symptoms in the relative frequency of their occurrence.

	Per Cent		Per Cent
Cough	72.3	Edema	18.1
Sputum	67.5	Night sweats	18.0
Pain	59.8	Clinical secondary deposits	16.5
Dyspnea	59.8	Vomiting	10.0
Emaciation	48.2	Dysphagia	7.4
Pyrexia	42.8	Hoarseness	6.9
Hemoptysis	40.0	Clubbed fingers	5.9
Dilated veins	19.3		
Cyanosis	18.5		

From the clinical standpoint one can safely say that there are no symptoms which are absolutely pathognomonic of the condition. Certain conditions, however, should call attention to the possibility of a primary bronchial tumor. If an individual in the middle years of life or beyond, more particularly a male, without good cause, gradually develops a persistent cough, with little or no expectoration, associated with some sensation of tightness or breathlessness, or perhaps a little blood in expectorated material, one can certainly consider primary bronchiogenic carcinoma as a likely cause for such a picture. The possibility of a bronchial tumor must be kept in mind in the differential diagnosis of any pulmonary condition, particularly so if the clinical picture is at all bizarre or if there is an element of atelectasis demonstrable.

The cough of early bronchiogenic carcinoma is usually a slight irritative cough, at first dry, later productive of a small amount of mucoid secretion and occasionally a small amount of blood. It is occasionally associated with a slight wheezing due to narrowing of the bronchus by a projecting tumor mass. Later as obstruction and secondary infection supervenes the cough may become more persistent and produce purulent sputum from areas of the lung obstructed by the interbronchial tumor. Cough and expectoration then become the same as in ordinary chronic suppurative disease of the lung.

The pain associated with early bronchiogenic carcinoma is usually not true pain but rather a sense of tightness in the chest from the associated atelectasis. Later true pleurisy may develop from malignant invasion of the pleura or secondary infection of the pleura from superimposed infection in the atelectatic area. Direct invasion of the pleura, intercostal nerves or ribs by the spreading tumor may give rise to slight pain at first from intercostal nerve irritation but later may become very severe as a tumor directly involves the chest wall. Occasionally pain is produced by direct pressure on adjacent structures by the rapidly growing tumor mass. In the case of an apical tumor directly infiltrating the apex of the lung and adjacent brachial plexus, considerable pain over the distribution of the plexus may be produced before the nerves become interrupted by the tumor tissue.

Dyspnea associated with this condition at first is not true dyspnea but rather a sensation of breathlessness or inability to completely fill the lung, due to obstruction of some portion of the lung by the growing tumor. Later as the tumor mass develops true dyspnea may be produced by a huge mass of tumor tissue, by the blocking off of more bronchi, the development of a pleural effusion, by metastasis to the contralateral lung or by the development of large masses of metastatic tumor in the mediastinal lymph nodes giving pressure on the trachea.

Emaciation and pyrexia are usually not seen early, and when they do appear are more likely to be due to the sepsis of secondary infection than to cachexia from the tumor itself. Elevation of temperature can occur from the development of atelectasis in a portion of the lung but is more likely to be the result of secondary infection in the bronchi distal to the obstructing tumor, where pneumonitis, abscess and bronchiectasis frequently develop. Blood spitting which occurs in about 40 per cent of patients is more likely to be in the form of blood streaks or small hemorrhages rather than those of alarming proportions, although occasionally with sloughing of the tumor mass free bleeding may be encountered. Cyanosis, edema and dilated veins are more likely to be associated with extensive mediastinal lymph node involvement than from the primary tumor mass itself. Night sweats are in no way characteristic of the condition and are usually the result of a secondary infection.

The clinical secondary deposits of tumors appear frequently, particularly in the late stages of the condition and must always

be searched for diligently before undertaking any radical surgical treatment for the condition. They are most likely to be found in the same or contralateral lung, in the mediastinal, cervical or retroperitoneal nodes, and in the liver or the brain. At times the diagnosis of primary tumor is established by the finding of a clinical secondary deposit which may altogether overshadow a very small primary tumor. Vomiting should always call attention to the possibility of cerebral metastases, or the presence of liver or retroperitoneal lymph node involvement. Dysphagia is usually associated with mediastinal lymph node involvement and compression of the esophagus, or cardiac end of the stomach by metastatic deposits. Hoarseness is most likely the result of interruption of the recurrent laryngeal nerve by direct invasion or pressure from involved mediastinal nodes. Clubbed fingers are most usually seen associated with secondary infections but may occasionally occur in large tumors with little or no infection present.

The apical pulmonary tumors once described by Pancoast as "superior pulmonary sulcus tumors" and thought to be of different origin are now recognized to be merely a primary or occasionally a secondary tumor lying high in the lung producing symptoms by direct infiltration of the adjacent structures. They deserve special mention because they differ somewhat in symptomatology from tumors originating lower down in the lung. Early they produce few or no symptoms until by direct extension of the growth they invade the chest wall, ribs, brachial plexus and at times the sympathetic nerve trunks. As the condition progresses chest wall pain, atrophy of muscles in the shoulder girdle with impairment of arm function, invasion of the adjacent rib or vertebral bodies with interruption of the sympathetic nerve trunk and the appearance of a Horner's eye syndrome may occur. These patients present greater interest from the diagnostic than the therapeutic standpoint as from the time of discovery they are inoperable, and in the majority of instances receive little benefit from radiation therapy except perhaps temporary relief from pain.

Physical Findings and Diagnosis

The physical findings in primary bronchiogenic tumor are extremely variable depending upon the location, shape, size and character of the tumor. Clinically the disease is found most commonly in the upper lobes of the lung, more frequently on the left than the right side. Simons in a collected series of 649 patients reports as follows:

Left upper lobe, 179; left lower lobe, 112; right upper lobe, 169; right middle lobe, 70; right lower lobe, 119.

Clinical findings vary with the type of obstruction which the tumor produces in the bronchus and likewise in the size of the bronchus obstructed. Early, with an incomplete bronchial obstruction, one expects to find a wheeze. Later as the tumor mass increases permitting the passage of air on inspiration only an obstructive emphysema develops giving a resonant percussion note with extremely distant breath sounds over the involved area, physical findings which Vinson described a number of years ago as of frequent occurrence in bronchiogenic tumor. Later as the obstruction becomes more complete and the air distal to the obstruction absorbs we have the findings of atelectasis over the involved area, with or without displacement of adjacent structures, depending upon the size of the area involved and the relative fixation of adjacent tissues. Later the physical findings become altered as pleural effusion or suppuration develops within the lung masking the underlying process.

Physical findings of some importance in the differentiation from upper lobe tuberculosis are the persistent moderately coarse rales after cough, more likely to be present in the tuberculous lesion. An atelectatic lesion in the lung secondary to a stenosing tracheobronchial tuberculosis may present the same picture to X-ray and physical examination as primary bronchiogenic carcinoma. The high incidence of sputum positive for tubercle bacilli in tuberculous ulceration is a distinct aid in a differential diagnosis. The spontaneous occurrence of diaphragmatic paralysis or interruption of the sympathetic or recurrent nerves should immediately arouse suspicion of a malignant process. In fact, the occurrence of any peculiar process in the chest should make one consider the possibilities of malignancy in the differential diagnosis. Unfortunately, more cases of primary malignancy in the lung are overlooked because the physician does not think of the condition than because he is unable to establish a diagnosis once his suspicion is aroused.

In order to definitely establish a diagnosis of primary bronchiogenic carcinoma a number of diagnostic procedures are available, and the use of some, if not all, may be necessary. If adequate history, physical examination and X-ray studies have been made the following diagnostic procedures should be considered in about this same order.

1. *Bronchoscopy.* Bronchoscopic examination should be made in any case where any intrabronchial lesion is anticipated. In the areas which may be visualized by the bronchoscope, the examination will not only give most accurate information as to location, size and shape and relations of any tumor mass but enables the examiner to remove a section for microscopic examination to determine the exact nature of the lesion present. This is the most valuable of the group and may in a high percentage of instances give all the information necessary to diagnose and localize the offending lesion. Diagnostic bronchoscopy should be carried out in all cases in which there is the slightest suspicion of bronchial obstruction. Repeated examination may be necessary.

2. *Bronchography.* Carefully made bronchograms following the installation of iodized oil may accurately localize the bronchial obstruction and the position, size and some of the relations of the offending tumor. It is especially valuable in those areas of the lung which are beyond the line of vision in bronchoscopy, particularly the upper lobes and the smaller bronchi. Bronchiectatic or abscess cavities not visualized on ordinary films may be clearly shown because the marked radiopacity of the oil permits the use of X-ray exposure sufficient to penetrate the pleural effusion, or thickened pleura or atelectasis which otherwise blot out everything on the film. Repeated inability to fill a certain area of the lung may be of distinct value in localizing bronchial obstruction.

3. *Sputum examination.* Careful microscopic examination of expectorated material by a pathologist who is familiar with the cystology of sputum may be sufficient in certain instances to establish a diagnosis of bronchiogenic carcinoma. The material is fixed, embedded in paraffin and sections cut for microscopic examination. Suspicious particles suggesting bits of tissue in the sputum are best at this examination. The percentage of positive diagnoses by this method is not particularly high but occasionally it is of value. The sloughing or necrosis on the superficial portions of the tumor mass result in the dislodgment of portions of the tumor, likewise usually cause disintegration of the material so that characteristic cells are not easily recognized under the microscope. When the report is positive it is diagnostic, but negative examination in no way rules out the presence of bronchiogenic tumor.

4. *Examination of pleural fluid.* Aspiration of pleural fluid and microscopic study of cells present should be made in all cases in which a differential diagnosis must be made. Occasionally a direct study of sediment of such fluid if properly obtained may establish the diagnosis, but more frequently it is necessary to sediment the material and fix it in paraffin or some other substance so that sections may be made. This method is more accurate but again calls for the services of a pathologist who is thoroughly familiar with the cystology of pleural fluid. The presence of malignant cells in pleural fluid is an indication of pleural metastases.

5. *Diagnostic pneumothorax.* The establishment of diagnostic pneumothorax either by primary injection of air into the pleural cavity or following the aspiration of pleural fluid may be of some help in establishing a diagnosis. The presence of an air blanket around the lung may enable the roentgenologist to outline a tumor mass in the lung in an area previously obscured by the pleural effusion. At times also it may enable him to visualize pleural metastases. Pneumothorax may alter the position of the upper lobe to enable the bronchoscopist to visualize a tumor in the upper lobe bronchus invisible before collapse of the lung. The establishment of pneumothorax is likewise of value as a preliminary measure where exploratory thoracotomy or other surgical intervention is contemplated.

6. *Thoracoscopy.* Following the aspiration of pleural fluid, or the establishment of a pneumothorax, additional information of value may at times be obtained by the insertion of a thoracoscope into the pleural cavity for direct visualization of the pleura. At times the tumor mass may be seen in this way

and the presence of pleural metastases demonstrated. It is likewise possible by this method in certain instances to obtain a biopsy of the tumor tissue from the pleural cavity.

7. *Peritoneoscopy.* The exploration of the peritoneal cavity by means of a telescope following the establishment of a pneumoperitoneum may enable the operator to recognize the presence of liver metastases and thus save the patient more extensive surgical procedure which otherwise might be undertaken.

8. *Exploratory thoracotomy.* There are a number of instances in which exploratory thoracotomy is justified in order to establish or disestablish a tentative diagnosis of primary pulmonary malignancy. This is particularly so if the lesion is still within the limits favorable for possible surgical resection. If the exploratory thoracotomy reveals conditions are favorable for resection the operation may be continued as a radical extirpation of the carcinomatous lung. In some patients a diagnosis of malignancy can be made in no other way. All other preliminary diagnostic procedures, of course, should be utilized to the utmost before an exploratory thoracotomy is undertaken, because it is in itself a procedure of major importance.

9. *Aspiration biopsy.* Aspiration biopsy with removal of a small amount of material from the center of the tumor mass for microscopic study may at times confirm the diagnosis of malignant tumor. In the case of large tumor masses adherent to the chest wall, without clinical evidence of local infection, it may be a permissible and a relatively harmless procedure which will enable the operator to obtain microscopic proof of the nature of the tumor mass. The procedure is, however, not altogether without danger. If infection is present the pleural cavity may well be contaminated. If normal lung tissue must be traversed in order to reach the tumor mass the possibility of accidental pneumothorax or intrapleural hemorrhage cannot be overlooked. The possibility of an air embolism by the insertion of a needle sufficiently large to give a good aspiration biopsy is within the realms of possibility. If the tumor has not already metastasized or broken through its surrounding capsule, such diagnostic puncture may well open the channels for such spread from a local growth. Perhaps the most valid objection to this diagnostic method lies in the fact that it is of little or no value in the diagnosis of the earlier lesions which may still be within the group possibly suitable for surgical therapy. Its use in the region about the hilum with its large vessels is not without distinct danger. Its widespread use is not to be advocated.

The importance of early diagnosis cannot be too strongly stressed. Late diagnosis may complete the patient's chart and aid in compilation of statistics but is of no particular value to the patient. In the treatment of all types of carcinoma we must strive for early diagnosis. Valuable time must not be wasted if we are to help the patient. The loss of two or three months or more while the patient is being treated for pulmonary tuberculosis or while the effect of radiation therapy is awaited may mean the difference between recovery and death to the individual patient.

Once the diagnosis of primary bronchiogenic carcinoma has been established the situation should be reviewed as to the possibilities of surgical intervention. The following may be presented as criteria of possible operability:

1. Absence of distant metastases.
2. Absence of mediastinal involvement.
3. Absence of lung metastases.
4. Absence of pleural metastases as proven by the visualization of pleural masses of tissue or the finding of carcinoma cells in the pleural fluid.
5. Absence of liver metastases.
6. Absence of tracheal involvement.
7. At least 1 centimeter of stem bronchus must be free of tumor.
8. The absence of cardiac, renal or other serious disease.
9. The patient's general physique must be sufficiently robust to offer a legitimate chance of withstanding radical surgery.
10. The age group and expectancy must be suitable for radical surgery.

If these conditions can be met or at least tentatively met then we feel justified in recommending an exploratory thoracotomy, planning on radical surgery if conditions prove favorable. At the time of such exploration local conditions may be found which render the condition inoperable, such as mediastinal involvement, lymph node involvement beyond the primary nodes which can be extirpated, or direct infiltration of the chest wall, diaphragm or mediastinal tissues. The finding of enlarged lymph nodes in the mediastinum *per se* may not indicate that the condition itself is inoperable as associated secondary infection in the lung may give rise to a non-malignant mediastinal lymphadenitis.

Considered from the opposite standpoint the following may be taken as absolute criteria of inoperability:

1. Distant metastases, particularly brain, bone, etc.
2. Liver metastases.
3. Large mediastinal mass.
4. Evidence of interruption of the phrenic, sympathetic or recurrent laryngeal nerves, usually from infiltration or direct pressure.
5. Enlarged cervical or axillary lymph nodes positive to biopsy.
6. Involvement of the trachea or stem bronchus immediately adjacent to the trachea.
7. Evidence of pleural involvement with demonstrable pleural masses or malignant cells in the pleural fluid.
8. Advanced years, marked debility, coronary heart disease or other serious lesions pointing to very limited expectancy.

From the surgical standpoint primary bronchiogenic carcinoma presents some of the same surgical possibilities for surgical cure as does carcinoma of certain other accessible localities, as the breast, stomach, colon and so forth, where there is a primary blood supply which can be controlled and the primary lymphatic drainage can be extirpated with the tumor and surrounding tissues. For this reason the possible surgical treatment of primary tumors of the lung has appealed to the surgeons for a considerable period of time, but it is only with modern developments in thoracic surgery and anesthesia that it has been feasible to undertake such procedures. With modern anesthetic technique, utilizing high oxygen concentrations and positive pressure administration, it is now possible to open the thoracic cage widely, to carry on an extensive surgical manipulation and still maintain the patient in good condition. Cyclopropane has been especially valuable in this field because of the very high oxygen concentration which can be maintained. More recently Dr. Ralph Knight has been carrying patients for me under intravenous pentothal sodium anesthesia with intratracheal oxygen in a manner which has proven very satisfactory thus far.

The resection of the lung may be carried out through either an anterior or posterior approach depending upon the surgeon's preference. Both afford adequate exposure and access to the hilum of the lung to permit a primary ligation of the vessels with primary section and suture of the bronchus. If conditions warrant the procedure may be divided into two stages, the first including a dissection of the hilum structures and ligation of the pulmonary artery and the second including the rest of the procedure at a subsequent date. Once the pulmonary vein has been obstructed, however, the operation must be completed or a wet gangrene of the lung will ensue. Mass ligation and extirpation of the lung by a tourniquet method probably has little or no place in the treatment of primary bronchiogenic malignancy as it does not provide for complete removal of the lung nor for removal of the glandular tissue in the mediastinum which is necessary in a radical extirpation. For the same reason, partial pneumonectomy or lobectomy has little or no place in the treatment of primary pulmonary malignancy, as they do not permit complete resection of possibly involved lung tissue, nor do they remove the primary lymphatics into which the tumor may have already spread.

TREATMENT

Primary bronchiogenic carcinoma when untreated carries with it 100 per cent mortality within an average period of less than one year from the time of diagnosis. Radiation therapy has at times brought about diminution of atelectasis, relief of pain, diminution in size of metastatic lymph nodes, and reduction of pressure phenomena caused by them, reduction in pulmonary bleeding, and perhaps in some instances some prolongation of

life. There has appeared as yet no adequately proven case of primary bronchiogenic carcinoma which has been cured by radiation therapy. A few cases have been reported in which the endobronchial destruction of local tumor by cautery or high frequency application has been followed by disappearance of the local growth and relief of symptoms. In many of these there still remains a question of doubt as to whether the original lesions were carcinomatous or whether they may not have been benign adenomas which are now being recognized fairly frequently.

With the marked development in thoracic surgery which has occurred in the past ten years there have appeared an increasing number of reports of patients who have survived and remained free of recurrence of the tumor for a period of several years following total excision of the lung by primary pneumonectomy for primary malignant disease. The excised material in these cases has offered ample tissue for studies to prove that the original condition was primary carcinoma and that its adequate removal by radical operation has been followed by survival of the individual for periods of time far exceeding anything which has previously been accomplished in the treatment of this disease. It is apparent, therefore, if the disease can be discovered early, radical surgical extirpation offers to the patient the best chance for survival of an otherwise invariably fatal condition.

Survival following surgical extirpation for periods up to seven years have been recorded since the first total pneumonectomy for carcinoma was performed by Graham on April 5, 1933. A considerable number of others of shorter duration are to be found in the literature. The longest survival in my own personal experience is a patient who is in good condition today, two years and nine months following total pneumonectomy for squamous cell carcinoma.

I have personally seen and studied more than sixty cases of primary bronchiogenic carcinoma. Unfortunately, the majority of these cases were far advanced when seen and beyond hope of any successful surgical intervention. From this whole group only thirteen were seen sufficiently early for any possible surgical intervention. One of these who had a tumor which undoubtedly was resectable was 68 years of age and had already had several coronary attacks which rendered the procedure inadvisable. Twelve patients were subjected to exploratory thoracotomy in the hope of finding a tumor which could be completely extirpated, but from this group only four, or 6.66 per cent, were resectable, all others already presenting extension of the tumor beyond areas which could be successfully extirpated surgically. This percentage of operability is very low as compared to Overholt's series of seventy-five cases in which eighteen, or 24 per cent, showed no evidence of metastasis.

All hope of surgical cure for bronchiogenic carcinoma depends upon an early diagnosis. This is not possible in all cases because of the insidious onset of the condition and a tendency for early metastasis in the more malignant types of tumors. Early diagnosis of this condition will be made only when all members of the profession have been taught to constantly bear in mind the possibilities of the occurrence of bronchiogenic carcinoma, and when a diligent search is made for it when any unusual situation presents itself in the lung. All delay in establishing diagnosis and instituting treatment must be avoided if we are to offer the patient any chance of a successful outcome.

Discussion

Dr. J. S. McCartney: I think Dr. Kinsella has given us a very comprehensive review of this question of carcinoma of the lung and has pointed out some of the difficulties in the diagnosis. He has also called attention to the apparent universal increase in the incidence of the disease. Some fifteen or twenty years ago when we had primary carcinoma of the lung at postmortem it caused discussion and argument as to whether it was really a primary carcinoma of the lung or whether the pathologist had failed to find the primary lesion in some other part of the body but now we get so many of these primary carcinomas of the lung that we are not surprised when some of these obscure chest lesions turn out to be carcinomas of the lung.

We really see quite a large number of them every year. We have had, at our Tuesday meetings, as many as two or three at one single session. I think I have seen two or three of these lesions in cases that Dr. Kinsella referred to, the one with two biopsies showing diagnosis of squamous cell carcinoma and then the lung that was negative after it was removed. This must be considered from two or three different angles; one of them was simply a metaplasia as Dr. Kinsella said and not a tumor at all. On the other hand, if I am thinking of the same lung he did, we had definite evidence that that metaplastic epithelium was at least invading and invasion is one of the criteria on which we make a diagnosis of carcinoma. You know that in the uterus there is a condition that is known as the malignant adenoma and may be entirely removed with the curette and at subsequent hysterectomy we find the uterus absolutely clean—perhaps some comparable condition existed in this lung, that this was a polypoid mass and was removed or destroyed at bronchoscopic examination. I do not know whether or not this was the case.

In former years it was commonly called a sarcoma because the cells were small, undifferentiated, did not make good epithelial cells and were in large masses and not at all in the form of cords or glands. In recent years the name primary sarcoma of the lung has disappeared and these seem to be instances of undifferentiated small type of cell carcinoma.

There is one other case I remember, some years ago, in which the patient gave no real evidence of any involvement of the lung. This patient's symptoms for a long time had been directed entirely to the back. He had been at Grand Rapids, Chicago, the Mayo Clinic, and finally at Glen Lake. All of the symptoms were referred to the back and he was thought to have Pott's disease. When he came to postmortem the lesion in the lung was about ¼ inch in diameter and partially blocked one bronchus. There were no metastasis except to the spine.

Dr. Kenneth A. Phelps: Dr. Kinsella's excellent paper has demonstrated again that cancer of the lung is on the increase. In fact, a patient over 40 with a persistent cough and hemoptysis should always be most carefully studied to rule out cancer. Just a few days ago I saw a patient at the Glen Lake Sanatorium with evidence of non-tuberculous bronchial obstruction. Carcinoma was considered the most likely diagnosis, but the biopsy report was Hodgkin's Disease. A few years ago Hodgkin's would have been the most likely diagnosis as cancer of the lung would have been considered too rare a disease.

From the standpoint of bronchoscopy we can often clinch the diagnosis of cancer of the bronchus by taking a specimen for biopsy. If we could only make the diagnosis earlier, Dr. Kinsella would have a larger series of cases suitable for cure by surgery.

I saw one patient with a cancer of the upper lobe bronchus which protruded into the main bronchus, causing obstruction to the lower part of the lung. Through the bronchoscope enough of the mass could be removed to open the lower bronchi and enable the patient to breathe much more comfortably.

Bronchoscopy is limited to the part of the bronchial tree which is visible through a straight tube. Upper lobe lesions and those in the very small bronchi are at present impossible to visualize.

Dr. Kinsella has reminded us that cancer of the lung is now a curable disease. It is up to us to make the diagnosis before it is too late for surgery.

Dr. Thomas J. Kinsella: Recently in an American Medical Association *Journal*, Overholt reported a series of seventy-five cases with 24 per cent operability. Certainly the number of operable cases which we see in this section of the country will not run that high. In the group which I have seen, some sixty patients, only fifteen, or 18 per cent, have presented any suggestion of surgical possibilities. We have explored thirteen, but only five, or 8 per cent, have been anywhere near resectible.

I think that possibly Overholt has a picked series of cases, many of which were sent to him for surgery, and that this accounts for the high percentage of operability in his group.

Ernest R. Anderson, M.D.,
Secretary.

Dr. C. D. Creevy presented a paper entitled: "Ureterocele, with a Report of Six Cases," at this meeting. It will be published in the November issue of The Journal-Lancet.

Secretary's Letter

SOUTH DAKOTA STATE MEDICAL ASSOCIATION

With this issue we are starting a secretary's column which we hope to make a regular feature of THE JOURNAL-LANCET. In this column will be items of news, minutes of council meetings and other information which the secretary's office wishes to communicate to members. Please look for it in order that you may be informed concerning the affairs of the association.

The following announcement is made at the request of Col. H. C. Gibner, Acting Surgeon, Seventh Corps Area:

Physicians Wanted for CCC Duty

Physicians are needed for the medical service of the Civilian Conservation Corps. The initial salary is $3,200 per annum. No quarters for families are provided, and the physicians are required to pay for their food at camps. Temporary quarters for physicians are provided at the camps for nominal fee. Physicians selected for this service are required to pay their own travel expenses to the headquarters of the district in which they are to be employed, where they are put on temporary duty for instructional purposes before being sent to camps. Travel expenses incurred in the transfer of physicians from the district headquarters to camps or in transfer from one camp to another are paid by the Government. If the services rendered are satisfactory, the employment is more or less permanent.

The principal duties at camps consist of the medical care of the enrollees and the practice of preventive medicine. To be eligible for this service, the physician must be a citizen of the United States, a graduate of an accredited medical school authorized to confer the degree of doctor of medicine, licensed to practice medicine and physically able to perform the duties involved. Physicians over sixty years of age are not ordinarily employed.

All physicians interested in this type of service are requested to submit their applications to the Office of the Surgeon, Headquarters Seventh Corps Area, Federal Building, Omaha, Nebraska, giving date on which available and preference of assignment in the following states: Minnesota, North Dakota, South Dakota, Iowa, Nebraska, Missouri, Kansas and Arkansas.

It is requested that young physicians not now listed in the American Medical Directory be informed of this service.

COUNCIL MEETING OF THE SOUTH DAKOTA STATE MEDICAL ASSOCIATION

Marvin Hughitt Hotel, Huron, So. Dak., Aug. 2, 1940

The Council of the South Dakota State Medical Association convened at the Marvin Hughitt Hotel, Huron, So. Dak., August 2, 1940, at noon.

The meeting was called to order by the chairman, Dr. S. M. Hohf. Roll call with the following members present: Drs. O. J. Mabee, B. M. Hart, C. E. Sherwood, J. D. Whiteside, D. S. Baughman, C. E. Robbins, G. E. Burman, W. E. Donahoe, S. M. Hohf, R. V. Overton and J. C. Shirley. Also present were Dr. J. R. Westaby, delegate to the American Medical Association, and Karl Goldsmith, our attorney.

The secretary presented the minutes of the previous meeting as appeared on page 293 of the July 1940 issue of the JOURNAL-LANCET. It was moved and seconded that they be accepted without further reading.

The financial statement of the Watertown District covering receipts and expenditures was presented by the secretary. After discussion it was moved by Dr. Hart and seconded by Dr. Whiteside that it has been customary in the past for the state medical society to take care of expenditures definitely belonging to the annual session but that outside entertainment provided by the host society in entertaining their guests was an obligation of the local society, and that the deficit and that portion of the statement be not allowed. Motion carried.

It was moved by Dr. Mabee and seconded by Dr. Whiteside that the state association should reimburse the host society to the amount of the banquet tickets for guests. Motion carried.

The bill of $133.45, for expenses of our delegate to the American Medical Association was presented and allowed.

The secretary asked Mr. Goldsmith to tell the councillors, recent rulings we had received from the Department of Internal Revenue relative to the association's status and he reported that the association was officially placed on the exempt list as far as income tax was concerned but they had ruled the association subject to the Social Security Tax and that the association be required to make a report of 1 per cent and to deduct 1 per cent of wages from salary of paid employees.

Letter from the secretary of the Eighth district relative to report of the group from several of the southeastern counties of the state relative to care of indigent was presented and after much discussion it was pointed out that the state association's action in this matter was simply confined to the transmission to the officers of different district societies, the information of the action in order that they might bring it up at their own district meetings for discussion. It was further pointed out that in any given county the method of caring for the indigent must be worked out between physicians and the county commissioners in each county and that it was necessary for physicians to all agree on what this method should be before they try to sell it to their commissioners, and that circumstances varied in each county so that a set plan would not work throughout the state but that there were ceratin principles such as free choice of physicians, etc., that should be used as a basis for these county agreements.

The secretary presented the matter of the American Medical Association Committee on Medical Preparedness and that Dr. Duncan of Webster had been appointed as representative from South Dakota.

The matter of the report of the Public Health Committee which had been referred to the Council by the House of Delegates at the last annual session was discussed and it was moved by Dr. Robbins and seconded by Dr. Whiteside that the state association give their approval to any legislation the board of regents or health authorities might sponsor relative to changes in charges made for tubercular patients at Sanator but did not feel that the association should sponsor such legislation.

Dr. Robbins brought up the matter of support of the Allied Council and the fact that the association should be represented fully on the Council. President Mabee with the approval of the Council, reappointed N. K. Hopkins and appointed J. C. Shirley in place of J. O. F. Kraushaar, deceased. It was also voted to assist the Allied Council in the budget to the extent of $50. It was moved by Dr. Baughman and seconded by Dr. Sherwood that a check be drawn in that amount and mailed to Secretary George Kienholz.

The next business was a report of the delegate, Dr. J. R. Westaby, of the recent meeting of the American Medical Association which was presented and approved for publication in the JOURNAL-LANCET.

The Committee on arrangements for the next annual session was elected by the Council to be President O. J. Mabee, President-elect B. M. Hart and Secretary C. E. Sherwood. On recommendation of the committee on arrangements, the council appointed Dr. E. W. Jones as chairman of local arrangements. Tentative dates for the Association meeting were set for May 18, 19, 20, 1941. After considerable discussion about ways and means of making the program of the state association better the meeting adjourned.

Respectfully submitted,
CLARENCE E. SHERWOOD, M.D., Secretary.

Committee on Medical Preparedness

According to records from the American Medical Association, 504 questionnaires have been sent to physicians in South Dakota. As of about August 9th, 315 of the questionnaires have been received in the offices of the American Medical Association. It is urged that all who have not returned the questionnaire filled in, should do so at once. If you have misplaced or have not received the questionnaire, write this office in order that another may be forwarded to you.

CLARENCE E. SHERWOOD, M.D., Secretary.

REPORT OF THE SOUTH DAKOTA DELEGATE TO THE AMERICAN MEDICAL ASSOCIATION 1940 MEETING

J. R. Westaby, M.D.
Madison, South Dakota

The House of Delegates of the Ninety-first Annual Session of the American Medical Association met in the Waldorf-Astoria Hotel at 8 A. M. Monday, June 10th, and immediately settled down to work on the business of the session. Every individual and committee alike worked like veterans with a determination to complete the work at hand efficiently and with a perspicacity and unanimity that was remarkable and yet indicative of the manner in which the medical profession is united in solving its problems.

The Medical Preparedness Committee of ten members headed by the past president, Dr. Irvin Abell, especially are to be commended for the way in which they classified the medical profession for service at home and abroad when needed to resist any aggression that may come upon us. This Committee is in constant contact with the Surgeon General's office in Washington, D. C., and the Public Health Service, as well as all other governmental services, requiring medical coöperation for medical preparedness.

The survey of the physicians of the United States of America has already been made and local and county medical societies are being asked to coöperate in aiding the Civil and Federal authorities in obtaining the proper quota of medical men for service at home and abroad. In the event of a National emergency of great magnitude, it would be very necessary to conserve the medical men and distribute the physicians so that there would be no stripping of rural and isolated communities of their needed medical personnel. Dr. G. C. Dunham, Colonel of the United States Army Medical Corps, appeared before the House of Delegates and presented a tentative plan for procurement of medical personnel for the medical corps prepared by the Surgeon General's office which was considered and referred to the Preparedness Committee for adoption into its program.

The final resolution reads as follows:

Whereas, The ravages of war again pervade many of the nations and peoples of the world; and

Whereas, The President of the United States has indicated to the nation and to the Congress the desirability of military preparedness so that our people may successfully resist attempts to substitute other forms of government for the democracy established by the Constitution of our country; and

Whereas, Organization of the nation for preparedness involves from the first the complete coöperation of the physicians of the country for:

1. Medical services in the Military, Naval, Aviation and Veteran's administrations;

2. Selection of men physically fit to serve with such agencies; and

3. Rehabilitation of those not physically qualified (to enable them) to participate in military activities; and

Whereas, Preparedness demands also

1. Medical service to the industrial workers engaged in war industries;

2. Continuance of medical care of the civilian population;

3. Education of young men to qualify them for medical service; and

Whereas, The American Medical Association now embraces in its membership more than 117,000 of the licensed physicians of the United States; and

Whereas, The headquarters of the American Medical Association have available facilities as follows:

1. Complete records of all qualified physicians in this country, with data necessary to determine largely their availability for military or other services;

2. Complete information concerning facilities for education in medicine, the medical specialties and other medical activities;

3. Complete information concerning the hospitals of the United States;

4. The necessary facilities for making prompt contact through addressing devices, periodicals and constituent bodies with all medical personnel and medical agencies; and

Whereas, Only in the headquarters of the American Medical Association, as far as is known, are such information and facilities available; and

Whereas, The American Medical Association is not only the largest but also the only organization containing in its membership qualified physicians in every field of medical practice; and

Whereas, During the World War of 1914-1918 the American Medical Association aided in making available the services of more than 60,000 physicians for military and related activities; therefore, be it

Resolved, That the House of Delegates authorize the Board of Trustees to create a Committee on Medical Preparedness, to consist of ten members of this House, with the President of the Association, the Secretary of the Association, the Secretary of the Board of Trustees and the Editor as ex-officio members; and be it further

Resolved, That this Committee establish and maintain contact and suitable relationship with all governmental agencies concerned with the prevention of disease and the care of the sick, in both civil and military aspects, so as to make available at the earliest possible moment every facility that the American Medical Association can offer for the health and safety of the American people and the maintenance of American democracy.

. . . . . .

The Distinguished Service Award was this year conferred on Dr. Chevalier Jackson of Philadelphia, professor of esophagoscopy and bronchoscopy, for his most distinguished work in that field.

The address of Dr. H. H. Shoulders, Speaker of the House of Delegates, was in defense of the principles of the organization of the American Medical Association which have made it a great and respected organization serving the public welfare and the physician alike and guiding the progress of the science and art of medicine making it safe and preserving those principles which contribute to that priceless heritage of freedom for all.

Dr. Rock Sleyster, President of the American Medical Association reviewed his findings on his visits about the United States in contact with medical men in state and local organizations, where he found them solidly united in effort and interest for the work of the Association and the protection of the public welfare.

Dr. N. B. Van Etten, President-elect, gave a very forceful address, one paragraph of which may suffice to awaken the medical men from the indifference which has affected many of them during the last decade.

"The last time the American Medical Association met in New York City was in 1917 when the country was involved in the World War, which enlisted the medical profession in a selective draft in military training, in military hospitals here and abroad, and in active service on the field of battle. Again the horrors of fratricide of even wider dimensions stir our emotions! Again the uncertainties of the continuation of our civilization present a confusing prospect. After long preparation of a new generation of people, through education in paganistic ideologies, intolerance, persecution and brutal expulsion of nonconformists; after reversions from limited democracies to autocracies of the most violent types the pagans are marching, destroying peaceful homes and murdering inoffensive civil neutrals in an effort to gain world domination. Again the medical profession in America is being mobilized to defend our liberal democracy against invasion of foreign influences."

Following the report of Dr. Olin West, Secretary of the American Medical Association, slight changes of the constitution were brought up and referred to the proper committee for action.

Dr. Arthur W. Booth, Chairman of the Board of Trustees, stepped to the microphone and read the following indictment of the American Medical Association:

"The Supreme Court of the United States has denied the petition of the Association for a writ of certiorari: hence the Association must now stand trial in the United States District Court of the District of Columbia. Word has been just received to the effect that representatives of the Association and the members of the Administration personnel who were in-

dicted by an additional grand jury impaneled at the request of the Department of Justice of the United States must be in Washington, D. C., on Friday morning at 8 o'clock June 14th to make appearance before the Court."

This was quite unusual since the Court knew the American Medical Association would be in session until Friday afternoon and Saturday would have been much more convenient for the physicians to attend. All reported on time in Washington, D. C., and plead "Not Guilty" of a conspiracy in restraint of trade and the commission of a crime against the Group Health Association. The Government must now prove their guilt. The Court cannot sustain its burden of proof if the Group Health Association has been practicing medicine illegally. The Judge has ordered the trial to begin in the fall and Organized Medicine now must face future Governmental regulations and proscription as a trade and not as a learned profession.

Among the important Resolutions adopted were:

1. Approval of action of Council on Medical Education and Hospitals whereby objectives equally beneficial to medical schools, interns and hospitals, the medical profession and the general public were attained.
2. Resolution from the Section of Ophthalmology regarding conservation of vision and prevention of blindness.
3. Report from Council on Medical Education and Hospitals establishing principles for founding admissions, requirements, supervision, curriculum, teachers, laboratories, degrees, and financial support for graduate medical schools.
4. Resolution on Control of Venereal Disease Program recommending that because of the dangers of intravenous therapy, such medication should be administered only by a duly qualified physician of medicine.
5. Resolution concerning certain objectional practice of insurance companies.
6. Reports of Committees on Legislation and Public Relation concerning building of Federal hospitals for veterans, and other hospitals for other groups.
7. Reports of Committees contacting influential Farm Groups, the Associated Women of the American Farm Bureau Federation, especially suggesting satisfactory improvements in rural medical care.

ELECTION OF OFFICERS

The following officers were elected: Dr. Frank H. Lahey of Boston, president-elect; Dr. Ben R. McClellan of Ohio, vice-president; Dr. Olin West, Chicago, Ill., secretary; Dr. Herman L. Kretschmar, Chicago, treasurer; Dr. H. H. Shoulders, Tennessee, speaker of the House of Delegates; Dr. Roy Fouts, Omaha, Neb., vice-speaker of the House of Delegates.

The place of meeting for the next three years is as follows: Cleveland, Ohio, 1941; Atlantic City, 1942; San Francisco, 1943.

TENTATIVE PROGRAM SOUTH DAKOTA PUBLIC HEALTH ASSOCIATION

Huron, South Dakota, October 28, 1940

MORNING SESSION

Registration.

Milk Sanitation—Jess C. Robinson, State Board of Health, Pierre, South Dakota.

Tuberculosis Control Through Epidemiologic Investigation—Gaylord W. Anderson, M.D., University of Minnesota, Minneapolis, Minnesota.

Dutch Luncheon.

AFTERNOON SESSION

Business Meeting (Election of Officers).

The Role of the Part-time Health Officer—Gaylord W. Anderson, M.D., University of Minnesota, Minneapolis, Minnesota.

Recommended Immunization Procedure and Technique—A. Triolo, M.D., State Board of Health, Pierre, South Dakota.

News Items

Dr. Robert M. Morgan has joined the staff of the Murray hospital clinic in Butte, Montana, where he is associated with Dr. Lee W. Smith. Dr. Morgan, a native of Montana, was graduated from Northwestern University medical school in 1937.

Dr. W. A. Wright of Williston and Dr. A. D. McCannell of Minot were recently appointed to the North Dakota State Board of Medical Examiners for three year terms by Governor John Moses. They succeed Dr. William C. Fawcett of Starkweather and Dr. J. W. Bowen of Dickinson. Dr. W. A. Gerrish of Jamestown was reappointed to a three year term on the board.

Dr. Allen G. Johnson has taken over the practice of Dr. N. J. Kulzer in Hastings, Minnesota.

Dr. Frank J. Ankner of Chicago has become associated with the Bratrud Clinic in Thief River Falls, Minnesota.

Dr. Everett C. Perlman, Minneapolis, has recently received a grant from the government to study rheumatic heart disease in children. The one year study will be conducted at the Lymanhurst Heart Hospital in Minneapolis.

Dr. J. M. Spatz, formerly of Glasgow, Montana, is now practicing in Cut Bank.

Dr. Leon D. Harris, Minneapolis, has become associated with Dr. A. W. Spiry in Mobridge, South Dakota.

Dr. Robert Campbell is now associated with Dr. D. N. Monserrate in Helena, Montana. A graduate of Northwestern University medical school, Dr. Campbell recently completed his internship at St. Joseph hospital, Chicago.

Dr. Hugh W. Hawn of Minneapolis has joined the Fargo Clinic staff and is associated with Dr. George Foster in the eye, ear, nose and throat department.

Dr. B. D. Mitchell has taken over the practice of Dr. R. E. Brogan, former resident of Deer Lodge, Montana. Dr. Mitchell is a graduate of the University of Minnesota medical school.

Dr. C. L. Biorn of Jackson, Minnesota, has been awarded a three-year fellowship in surgery by the Mayo Clinic, Rochester.

The annual diagnostic crippled children's clinic was held in Conrad, Montana, October 3. Counties served were Glacier, Pondera, Teton and Toole.

Dr. Stephen C. Bacheller, formerly of Osceola, Iowa, is now practicing in Enderlin, North Dakota.

Dr. W. F. Cogswell, secretary of the Montana state board of health, was recently called to Washington, D. C., for a conference with other state health officials and the surgeon general of the U. S. public health service. Health problems in connection with the national defense program were discussed.

Dr. Louis Gerber, formerly resident physician at Trinity hospital, Minot, North Dakota, is now practicing in Stanley.

A state division of industrial hygiene has been organized at Helena, Montana. The division which was created by the 1939 legislature will study and test health conditions of Montana workers. Included in its work will be a study of occupational diseases; investigation of sanitary conditions and enforcement of industrial health regulation.

Dr. J. A. Muggly, Madison, South Dakota, was elected president of the Madison Community hospital recently.

Dr. Alfred M. Ridgway, Annandale, Minnesota, was honored by more than 2,000 persons recently on the occasion of his golden anniversary as a physician.

Dr. D. S. Branham and Dr. S. A. Whitson, Alden, Minnesota, have purchased the practice of the late Dr. H. D. Burns of Albert Lea, Minnesota.

The number of county health units under the auspices of the United States Public Health Service—of which South Dakota has 11—has increased over 1,000 per cent during the past 20 years, Prof. W. F. Kumlien, South Dakota agricultural experiment station rural sociologist, has found. Begun in 1919 as an effort to stamp out hookworm and malaria in 100 southern counties, there are now over 1,100 such county units in all parts of the United States. The heaviest concentration is found in the southern, eastern and southwestern areas of the United States.

Dr. Charles A. Arneson, Bismarck, North Dakota, surgeon and city health officer for the last three years, has gone to Philadelphia where he will take postgraduate work in surgery at the University of Pennsylvania.

Dr. H. C. Erickson, formerly of Ray, North Dakota, is now in Kramer, where he is medical officer in the C.C.C. camp there.

Dr. A. L. Klein is now practicing in Fargo, North Dakota. He formerly was in McHenry.

Dr. A. R. Foss, Missoula, Montana, is the new chief surgeon of the Northern Pacific hospital. He succeeded Dr. George M. Jennings who retired after 33 years of service with the association.

Dr. G. J. Shima, formerly of Montgomery, Minnesota, is now practicing in Sleepy Eye.

The Surgeon General of the Navy, Rear Admiral Ross T. McIntire, (MC), U.S.N., has announced that the Medical Corps of the Navy is being increased in strength proportionate with the expanding Navy and the Marine Corps. Examinations for appointments as commissioned officers in the Medical Department of the Navy will be held January 6th to 9th, 1941.

A circular of information for applicants for appointment as medical officers of the Navy, containing full information regarding physical requirements, professional examinations, rates of pay, and promotion and retirement data may be obtained by addressing the Bureau of Medicine and Surgery, Navy Department, Washington, D. C.

University of Minnesota Medical School

Dr. J. Frank Corbett retired July 1, 1940, from the faculty of the Medical School as clinical professor of surgery, division of neurosurgery. Dr. Corbett was made clinical professor emeritus of surgery.

Dr. Lemen J. Wells, formerly of the University of Missouri, has been appointed associate professor of anatomy.

Dr. Charlotte M. Gast has been appointed assistant professor and assistant director, course in medical technology.

Dr. Edwin S. Fetcher, formerly of the University of Chicago, and Dr. Robert B. Dean, of the University of Rochester, have been appointed instructors in the department of physiology.

The following promotions in the Medical School are announced:

Dr. Halvor O. Halvorson has been made professor of bacteriology; Dr. Raymond N. Bieter, professor of pharmacology; Dr. William A. O'Brien, professor of preventive medicine and public health and director of postgraduate medical education; Dr. Cecil J. Watson, professor of medicine and director division of internal medicine; Dr. William T. Peyton, professor of surgery and director division of neurosurgery; Dr. George O. Burr, professor of botany and of physiology, has in addition been appointed director of the division of physiological chemistry.

Dr. Arthur C. Kerkhof has been promoted to clinical associate professor of medicine; Dr. Starke Hathaway to clinical psychologist and associate professor of nervous and mental diseases; Dr. James B. Carey to clinical associate professor of medicine; and Dr. Wallace D. Armstrong to associate professor of physiology and director of biological research in dentistry.

Necrology

Dr. J. G. Randall, 67, of Missoula, Montana, died August 15, 1940. He had practiced in Missoula since 1904 and for many years was president of the Western Montana medical society.

Dr. Tracey E. Barber, 55, Grand Forks, North Dakota, died September 4, 1940. He was a member of the State Board of Medical Examiners.

Dr. L. W. Satterlee, 84, Alexandria, Minnesota, died August 30, 1940. He had been health officer of Alexandria for over 30 years.

Dr. A. A. Whittemore, 65, Wishek, North Dakota, died August 6, 1940. He had resided in North Dakota since 1886 and was the first full-time state health officer from 1923 to 1933.

Dr. Danforth C. Cowles, 66, of Fullerton, California, died August 27, 1940. Dr. Cowles was graduated from the University of Minnesota in 1901 and practiced medicine in Minneapolis before going to Fullerton in 1918.

LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS ON JULY 12, 1940

JUNE EXAMINATION

Name	School	Address
Alway, Robert Hamilton	U. of Minn., M.B. 1939, M.D. 1940	1386 Grantham, St. Paul, Minn.
Ankner, Frank Joseph	Rush Med. Col. M.D., 1938	Thief River Falls, Minn.
Barnes, Russell George, Jr.	U. of Minn., M.B. 1938, M.D. 1939	211 E. 2nd St., Hastings, Minn.
Beck, Charles Joel	U. of Minn., M.B. 1940	Murray Hospital, Butte, Mont.
Beck, Norman Russell	U. of Pa., M.D. 1937	Mayo Clinic, Rochester, Minn.
Bowers, Robert Newcomb	U. of Minn., M.B. 1939, M.D. 1940	Mazeppa, Minn.
Bratrud, Theodor Edward	Marquette U., M.D. 1940	U. of Minn., Dept. of Path., Minneapolis.
Butter, John Robinson	U. of Minn., M.B. 1940	Eloise Hospital, Eloise, Mich.
Decker, Charles Henry	U. of Minn., M.B. 1940	Wayne County General Hosp., Eloise, Mich.
Domeier, Luverne Henry	Loyola, M.D. 1940	Sleepy Eye, Minn.
Drapiewski, John Frank	Harvard U., M.D. 1937	Mayo Clinic, Rochester, Minn.
Drexler, George Warren	U. of Minn., M.B. 1939	Mpls. General Hospital, Minneapolis, Minn.
Dupont, Joseph Arthur	Loyola, M.D. 1940	Excelsior, Minn.
Eckdale, John Edward	U. of Minn., M.B. 1939, M.D. 1940	Fairview Hospital, Minneapolis, Minn.
Erickson, Eldon Wesley	U. of Minn., M.B. 1939, M.D. 1940	Mayo Clinic, Rochester, Minn.
Estrem, Robert Daniel	U. of Minn., M.B. 1940	Fergus Falls, Minn.
Ferguson, William James, Jr.	Rush Med. Col., M.D. 1938	1142 E. 45th St., Chicago, Ill.
Francis, Gilbert Smuin	Northwestern U., M.B. 1939, M.D. 1940	Morgan, Utah.
Friberg, Joseph Bertil	U. of Minn., M.B. 1940	Miller Hospital, St. Paul, Minn.
Friedman, Harry Samuel	U. of Minn., M.B. 1939, M.D. 1940	1617 11th Ave. S., Minneapolis, Minn.
Gouze, Frank John	U. of Minn., M.B. 1940	St. Mary's Hospital, Duluth, Minn.
Harper, Harry Penn	U. of Minn., M.B. 1936, M.D. 1937	Mayo Clinic, Rochester, Minn.
Harri, Edward John	U. of Minn., M.B. 1940	St. Mary's Hospital, Duluth, Minn.
Ives, Howard Rollin, Jr.	Yale U., M.D. 1937	Mayo Clinic, Rochester, Minn.
James, Ellery Meredith	Marquette U., M.D. 1940	520 S. 2nd St., Mankato, Minn.
Joffe, Harold Herman	U. of Ill., M.B. 1940	1718 E. 7th St., Duluth, Minn.
Joss, Charles Stevens	Northwestern U., M.B. 1939, M.D. 1940	Mayo Clinic, Rochester, Minn.
Jurdy, Mitchell Joseph	U. of Minn., M.B. 1940	614 S. E. Erie St., Minneapolis, Minn.
Kelly, Albert Charles	Marquette U., M.D. 1940	Coleraine, Minn.
Leeman, Judson Sheppard	U. of Minn., M.B. 1940	St. Barnabas Hospital, Newark, N. J.
Lehman, William Louis	U. of Minn., M.B. 1937, M.D. 1938	Mpls. General Hospital, Minneapolis, Minn.
Lindahl, Wallace William	Northwestern U., M.B. 1938, M.D. 1939	Mayo Clinic, Rochester, Minn.
Melancon, Joseph Francis	Marquette U., M.D. 1940	Route No. 7, St. Paul, Minn.
Nachtigal, Irving M.	U. of Minn., M.B. 1940	706 Cleveland St., Eveleth, Minn.
Newell, Frank William	Loyola U., M.D. 1940	Miller Hospital, St. Paul, Minn.
Papermaster, Ralph	U. of Minn., M.B. 1940	Mpls. General Hospital, Minneapolis, Minn.
Patterson, Hugh Donald	U. of Minn., M.B. 1940	2700 Napoleon, New Orleans, La.
Pearson, Lawrence Orville Hicks	U. of Minn., M.B. 1940	Miller Hospital, St. Paul, Minn.
Rosendahl, Frederick Glasoe	U. of Minn., M.B. 1939, M.D. 1940	2191 Commonwealth Ave., St. Paul, Minn.
Schmitz, Everett Joseph	U. of Minn., M.B. 1940	Northwestern Hospital, Minneapolis, Minn.
Shaw, Howard Arthur	U. of Minn., M.B. 1940	Trinity Hospital, Minot, N. Dak.
Shea, Andrew Whitman	U. of Minn., M.B. 1940	Mpls. General Hospital, Minneapolis, Minn.
Smedal, Harald Aasvald	Harvard U., M.D. 1936	Mayo Clinic, Rochester, Minn.
Soucheray, Philip Henry	U. of Minn., M.B. 1940	Jersey City Med. Center, Jersey City, N. J.
Starck, Frederick Mosier	U. of Minn., M.B. 1940	2268 Knapp St., St. Paul, Minn.
Sutch, Gabriel Charles	U. of Minn., M.B. 1940	Miller Hospital, St. Paul, Minn.
Tornberg, Gordon Carl	U. of Minn., M.B. 1939, M.D. 1940	942 E. Camp St., Ely, Minn.
Williams, Ray David	Washington U., M.D. 1937	Mayo Clinic, Rochester, Minn.
Wood, Clyde Othur	U. of So. Calif., M.D. 1937	Mayo Clinic, Rochester, Minn.

BY RECIPROCITY

Clauson, Carl Theron	U. of Wis., M.D. 1928	Bloomer, Wis.
Ittner, George Wash., Jr.	Washington U., M.D. 1937	882 E. Minnehaha Ave., St. Paul, Minn.
Kucera, Lad John	Creighton U., M.D. 1939	415 Woolworth Ave., Omaha, Neb.
Pierson, Roy Fredolph	U. of Neb., M.D. 1938	Slayton, Minn.

NATIONAL BOARD CREDENTIALS

Duffalo, John August, Jr.	U. of Minn., M.B. 1939, M.D. 1940	3852 10th Ave. S., Minneapolis, Minn.
Wood, William Walter, Jr.	U. of Minn., M.B. 1937, M.D. 1938	Mayo Clinic, Rochester, Minn.

The JOURNAL LANCET

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Vol. LX, No. 11
New Series

Subdural Hematoma*

A. L. Sahs, M.D.†
Iowa City, Iowa

DESCRIPTIONS of subdural hemorrhage have appeared in the literature under the headings of subdural hematoma, hematoma of the dura mater, and pachymeningitis hemorrhagica interna. One of the first cases on record[1] was reported by Ambrose Paré on Henry II who was injured in a tourney in 1559. Virchow[2] in 1857 added much to our knowledge of the pathology of this disorder, to which he gave the name of pachymeningitis hemorrhagica interna because he felt that the condition arose as a result of an inflammatory process of the dura mater. More recently Trotter,[3] Putnam and Cushing,[1] Gardner,[4] Leary,[5] Hannah,[6] Baker,[7] Kaump and Love,[8] Munro,[9] and Kunkel and Dandy[10] have made valuable contributions to the subject. Subdural hematomas in infancy and childhood have been reported by Rosenberg,[11] Sherwood,[12] Peet and Kahn,[13] Ingalls,[14] and Ingraham and Heyl.[15]

The dura mater is a tough fibrous connective tissue membrane which lines the skull and envelopes the venous sinuses of the cranial cavity. The dura forms the outer boundary of the subdural space, which, under ordinary conditions is a potential cavity having as its inner boundary the pia-arachnoid. Leary and Edwards[16] have shown that the subdural space is not a serous cavity, and thus is not capable of reacting to the presence of blood in the same manner as does the pleural cavity, for example. Considerable discussion has arisen relative to the exact location of the hematomas under consideration. Hannah,[6] Baker,[7] and Kaump and Love[8] have expressed the opinion that the hemorrhages actually are intradural, and that the dura is split to form the outer and inner limiting membranes of the hematoma. In a recent publication Leary[17] re-emphasizes the subdural nature of these lesions, and brings forth additional evidence to show that the bleeding actually is produced by rupture of bridging veins which traverse the subdural space.

A favorite location for subdural hematomas is over the convexity of the brain (fig. 1), with resulting compression of the hemispheres. The clot varies in thickness, sometimes reaching a maximum of 3.0 cm. and extending from the frontal to the occipital poles. Schreiber[18] has recently reported two cases of hematoma in the posterior fossa. The blood which is liberated into the subdural space is at first fluid, but soon becomes clotted. Later the contents may undergo change to a thin yellow or brownish fluid which contains remnants of disintegrating clot. Progressive enlargement has been attributed to recurrent bleeding, and to the high osmotic tension of the hematoma resulting in passage of cerebrospinal fluid through the inner wall which acts as a semi-permeable membrane. Occasionally complete healing takes place as a result of the fusion of the outer and inner neomembranes. Grossly the outer wall of the hematoma, the one adjacent to the dura (fig. 2), is relatively thick; the dura can usually be stripped from it. The inner wall is thin (fig. 3), and lies next to the arachnoid to which it does not adhere.

The microscopic picture varies, depending on the age of the hematoma. The outer wall usually resembles a highly vascular layer of granulation tissue, containing fibrin, fibroblasts, and blood vessels. Putnam and Cush-

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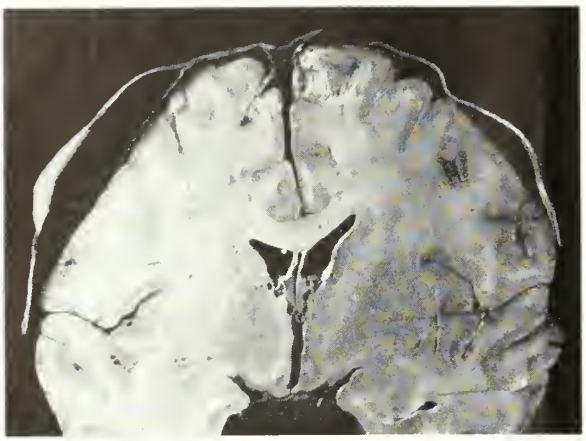

Fig. 1. Coronal section of brain with bilateral subdural hematoma, more extensive on the left. Note flattening of the cortex, especially on the left side, and ventricular distortion and displacement.

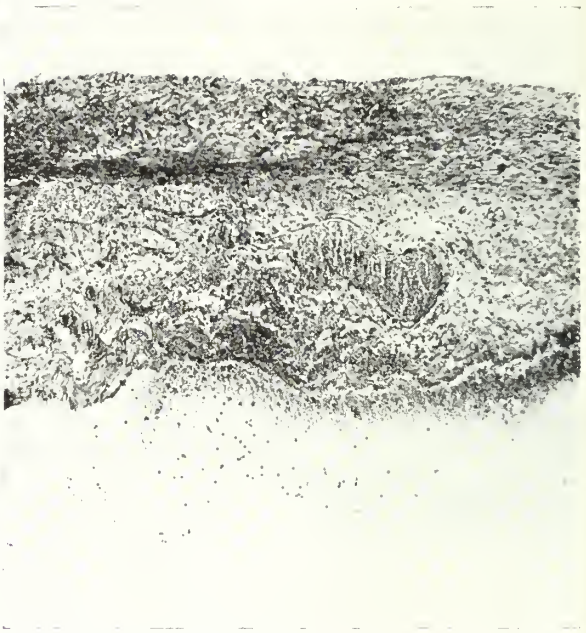

Fig. 2. Outer neomembrane removed at operation, showing fibrin, proliferating fibroblasts, and dilated vessels. Masson's trichrome stain. Photomicrograph.

ing[1] called attention to the large "mesothelial-lined blood spaces," which are conspicuous in microscopic preparations (fig. 2). These vessels may constitute a source of repeated hemorrhages. The thin inner membrane (fig. 3) contributes little to the process of organization of the hematoma.

Trauma is the most frequent cause of subdural hematoma. The original injury may be trivial or severe; it is not necessary that the trauma be applied directly to the head, or that the patient be rendered unconscious as a result of the accident. It must be remembered, moreover, that any degree of injury to the brain may be associated with this disorder. Alcoholism, infections, and avitaminosis, especially vitamin C deficiency, are contributing factors.

From the clinical standpoint one should consider first the subdural hematomas of children. Most authors agree that the condition is much more likely to occur in undernourished children. One of the first symptoms is a gradual enlargement of the head, a condition which is seldom noticed before the age of 4 months.[13] The unusual growth of the head is indistinguishable from hydrocephalus. Convulsions are frequent, and hemorrhages in the optic fundus are common in children with subdural hematoma. The diagnosis is established by puncture of the fontanel. Bloody or straw colored fluid will be obtained when the dura is penetrated. If the case in question is one of hydrocephalus, cerebrospinal fluid will appear when the needle has been inserted to a greater depth.

This subject takes on even greater significance in relation to adults. The condition is far more common in males than in females. Between the injury and the development of symptoms there is a latent period which may last several days, weeks, or months. The symptoms are those of an expanding intracranial mass. The patient develops headaches and vomiting. He complains of dizziness and occasionally diplopia. Generalized or Jacksonian convulsions occur in a small per cent of cases. Mental confusion, drowsiness, stupor, and coma are common signs. Papilledema, pupillary inequality, cranial nerve palsies and motor weakness are other manifestations which are of value in establishing the diagnosis. Localizing phenomena are frequently indefinite; it is not unusual for the lesion to be present on the same side as the hemiplegia. Furthermore, rigid insistence on increased intracranial pressure as measured through the spinal manometer will lead to serious diagnostic errors. Elevated spinal fluid pressure is helpful in the recognition of subdural hematoma; normal or even subnormal pressure does not rule out the condition. The presence or absence of blood in the spinal fluid is of little practical value in the diagnosis. Its presence means that there is bleeding into the subarachnoid space as a result of brain contusion or laceration. An uncomplicated subdural hematoma will not produce bloody cerebrospinal fluid.

Roentgenograms of the skull are likely to be disappointing. It is the exception rather than the rule to find evidence of skull fracture; if fracture is present it is much more likely to be found on the side opposite the hematoma.[19] Occasionally a shift of a calcified pineal gland will be of value in localizing the side of the lesion. In children suture separation may be present, as well as other changes in the skull.[20] In selected cases an encephalogram or ventriculogram will demonstrate a shift of the ventricular system to the side opposite the lesion (fig. 4).

The differential diagnosis of subdural hematoma includes the following conditions:

1. *Extradural hemorrhage.* This condition is much more likely to occur in young adult and middle-aged persons; it is commonly associated with a fracture line which crosses one of the cranial venous sinuses or the middle meningeal groove; it usually occurs at the point

Fig. 3. Inner neomembrane removed at operation. Masson's trichrome stain. Photomicrograph.

where the trauma is applied; the "lucid interval" is likely to be much shorter than in subdural hematoma.

2. *Cerebral contusion and laceration.* Diagnosis is complicated by the fact that any combination of conditions may exist. The patient is rendered unconscious; the duration of unconsciousness is usually a direct index of the severity of intracerebral damage. The spinal fluid is often bloody. If the patient begins to show improvement, regains consciousness, and then suffers a relapse in the form of increasing drowsiness, convulsions, or some of the other signs mentioned above, subdural hematoma must be kept in mind.

3. *Neoplasms of the brain.* One must be guided by the history, and at times by the results of encephalography or ventriculography. Vascular malformations of the brain (arteriovenous angiomas) can sometimes be recognized by the presence of a bruit, and by the roentgen examination which discloses parallel tortuous lines of calcification in the tumor.

4. *Infections of the central nervous system.* Neurosyphilis, in particular, should not offer great difficulty if the history is carefully taken, if the pupils are examined, and serological studies are carried out on blood and spinal fluid.

5. *Cerebral vascular disease.* This diagnosis is a convenient "catch-all" for obscure cases. Cerebral arteriosclerosis, hypertensive cardiovascular disease, cerebral hemorrhage, and the like, are easily mistaken for hematoma if the patient is past 40 years of age, if he complains of headaches and dizziness, and shows an elevation in blood pressure.

Treatment. Lumbar puncture and intravenous glucose (50 per cent solution) are merely temporary adjuncts. The method of choice is surgical removal of the blood from the subdural space. The type of operative procedure varies with different surgeons. Kaump and Love[8] advise turning down a rather large osteoplastic flap, Kunkel and Dandy[10] a small flap, while Horrax and Poppen[21] prefer to evacuate the hematoma through trephine openings. Surgical therapy is indicated as soon as the diagnosis is made. Inspection of both sides is often necessary because of the relatively high incidence of bilaterality and because of the frequent occurrence of paradoxical signs.

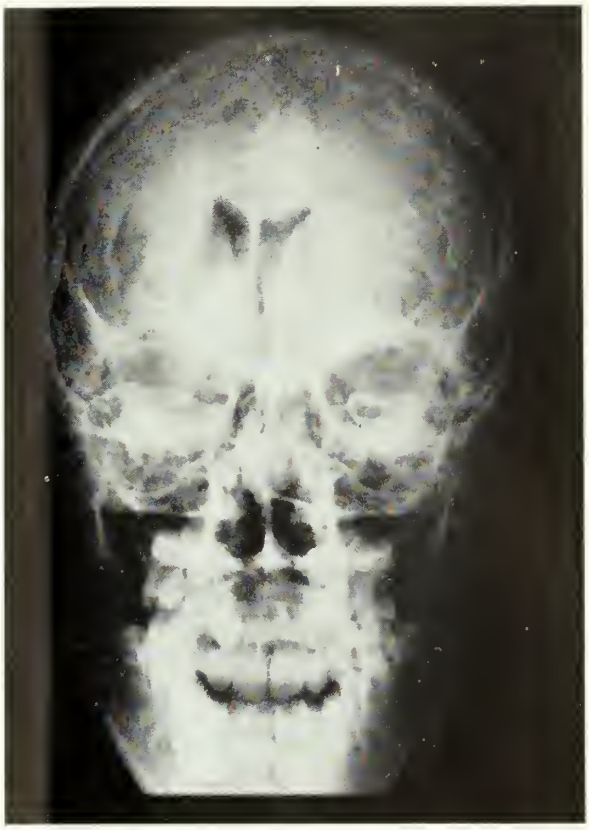

Fig. 4. Encephalogram of a left-sided subdural hematoma showing shift of ventricular system to the right.

Summary

1. Subdural hematoma occurs at any age. A trivial or severe injury is the usual etiological factor, although alcoholism, infections, and avitaminosis may play a part.

2. Blood entering the subdural space is absorbed slowly and inefficiently. Increase in size of the hematoma is due to recurrent bleeding or to absorption of fluid as a result of the higher osmotic tension of the contents of the sac.

3. The symptoms and signs are those of an expanding intracranial mass. There is a relatively high incidence of bilaterality and of paradoxical localizing signs.

4. The differential diagnosis, among others, includes epidural hemorrhage, cerebral contusion and laceration, infections and neoplasms of the brain, and cerebral vascular disease.

5. The treatment is surgical evacuation of the hematoma.

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Surgery of the Gall-Bladder Tract*

Based upon an understanding of the physiologic functions and pathological changes that take place in the liver

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MY purpose in presenting this paper is to convey to you, if possible, a clearer understanding of some of the important physiologic functions of the liver together with pathologic processes that may disturb these functions. I am positive that it is only by a clear understanding of these functions and changes that we can hope to do successful surgery on the gall-bladder tract. In view of the above statement, I feel that a brief resume of the anatomy, physiology, and pathologic reactions of the liver should be taken up more or less in detail.

It must be admitted that while there has been a great deal of work done by many investigators during the past several years on the physiology and pathology of the liver, there are still many important points regarding these processes that are not definitely clear. In the presentation of this paper, nothing original as to the physiology and pathology is attempted by the writer. Many of the statements and much of the data, together with the deductions and conclusions, have been compiled from the Collected Papers of the Mayo Clinic. Mann and his co-workers in that organization have, over the past decade, brought out many of the important points regarding the physiologic and pathologic processes that are hereafter stated in this paper. These men have indeed been as a lamp to our feet, in directing us to the application of these principles to surgical procedures.

In the concept of the anatomy of the liver, we must realize, as to mass, the liver occupies more structural space in the body than any other tissue, except that of the voluntary muscles, compiling about one thirty-sixth of the body weight. The liver is made up of lobules, held together by an extremely fine areolar tissue, in which ramify the portal vein, hepatic ducts, hepatic artery, hepatic veins, lymphatics, and nerves. The lobules form the chief mass of the hepatic substance. They are small, granular bodies, about the size of a millet seed. Their outlines are irregular. The bases of the lobules are clustered about the smallest radicles of the hepatic veins, to which each is connected by means of a small branch which issues from the center of the lobule. Each lobule consists of a mass of hepatic cells arranged in irregular radiating columns between which are the blood channels. These convey the blood from the circumference to the center of the lobule, and end in the intralobular vein. This vein opens at its base into one of the sublobular veins. Between the cells are the minute bile capillaries. Therefore, in each are all the essentials of a secreting gland; that is to say: (1) cells, by which the secretion is formed; (2) blood vessels, in close relation with the cells, containing the blood from which the secretion is derived; (3) ducts, by which the secretion, when formed, is carried away. Realization of the peculiar structure of the liver is relatively important, as we will note further on in dealing with the pathologic changes that take place in this organ and the relationship of these changes to its peculiar physiologic make-up.

The liver is unique in its blood supply in that it has two sources; one the arterial, the other the venous. The arterial blood coming through the hepatic artery is ar-

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terial in nature being under the normal arterial pressure and vasomotor control, and supplies the organ with oxygen. From the portal circulation comes blood, venous in character, having passed through one capillary bed, has added to it many substances absorbed from the pancreas and spleen as well as from the gastro-intestinal tract. The amount of venous blood reaching the liver is much larger in amount than that of the arterial supply. The blood, reaching the liver through these two structures, mixes before arriving in the hepatic vein, but the exact site where this fusion takes place is still not definitely known.

The nerve supply, which follows the course of the hepatic artery, is from the sympathetic and parasympathetic systems, the former predominating. Their function seems somewhat in doubt, except they probably have to do with the control of the blood supply.

As to the lymphatics, their site and origin have not been definitely determined. It was formerly thought that the liver played an important role in the formation of lymph. However, recent work indicates not much importance can be attached to the formation of lymph in the liver, rather it is considered only a necessary adjunct to its general activities.

The cells of the liver have numerous and very important functions. The stellate cells which line the sinusoids are included in the reticulo-endothelial system because they receive from the blood stream the same type of foreign bodies that do the cells of like type which are situated in the bone marrow and spleen. The hepatic cell is the cellular constituent which is responsible for the majority of the liver functions. These are situated in the radiating trabeculae of the lobule and are characteristic in size and shape.

The liver is dynamic, not static, and is not only noted for its numerous functions but also for the great variability in these functions. These functions are very definite and coördinated with other physiologic processes in other parts of the body, and few of them are completed wholly within the organ itself. Therefore, the physiology of the liver depends, in a large measure, on very rapid changes in rate, character, and capacity of the functional activity of not only the liver itself but of functional changes in other organs of the body.

Liver as a Storehouse

If we take into consideration that most of the higher organisms obtain their food at definite intervals, but the demand by the tissues for food for growth, repair, and for energy is constant, nature, of course, must have some provision to supply these tissues with their needs at a constant and unfailing level. Then, this being the case, some organisms, such as the liver, must have the capacity for storing supplies for these needs, and to supply them to the tissues as the tissues require them for the maintenance of the regulated metabolism of the body.

Foodstuffs are stored in other structures in the body, but the stores in the liver are not only relatively larger than any other tissue, but they are stored in such a manner that they can be more quickly mobilized for utilization. Carbohydrate in the liver is stored in the form of glycogen. This is the most readily available and most easily utilized of all. So far as investigators have been able to determine, the amount of glycogen stored in the liver varies a great deal, but the liver itself is only very rarely free of this important substance. The amount of glycogen which can be stored in the liver varies very widely, depending upon whether we are dealing with a normal or pathologic structure. However, investigation shows that the amount of glycogen stored in the liver may equal 20 per cent of the entire organ. It is still a moot question whether there is a special form of storage protein similar to glycogen as a storage form of carbohydrate, but there is no question that there exists a certain protein content of the liver which is labile and can be used by the tissues of the body. This form of protein differs from the protein in any other tissues, in that it can be very quickly mobilized, and a higher total percentage of the amount utilized.

The amount of fat stored in the liver at any given time must be accorded serious thought, as it it far reaching in its consequence, especially in dealing with any pathologic condition related to this structure. The fat content of the liver may equal 40 per cent of the total hepatic structure. The fat content of the liver is increased when the diet is composed of all fats; in the fasting state, in the presence of an available supply of fat in other fat deposits of the body and in certain pathologic conditions.

There is a definite reciprocal arrangement between the fat and glycogen content of the liver and both substances are seldom at a high level in the organ at the same time.

Experimentally, it has been shown that the liver containing an excess of fat is less resistant to insult; be that insult trauma or toxic substances, than one which is high in glycogen content. Again—a significant finding—it has not been possible by histologic studies to distinguish between the changes in the fat in the physiologic from that of the pathologic state. The inference is significant as it has to do with the preoperative care of the patient with gall-bladder disease.

Food substances, to a certain degree, can be utilized as they are absorbed from the intestinal tract, but not so readily as they can be utilized after being broken up by the liver. This is especially so in regard to carbohydrates. Carbohydrates that enter the blood stream in other forms than glucose, are converted by the liver into glucose or into glycogen. Protein is absorbed from the intestinal tract in the form of amino-acids until broken up by the liver. Some of the amino-acids are used to form new proteins for growth, repair of tissues, or for storage. Not all of these, however, are used in this manner. Many of them are broken up and burned for fuel. The nitrogenous portion is converted into urea for excretion as a waste product. The remaining portion is burned as carbohydrate. These two processes, the deamination of amino-acids, and the formation of urea, depend entirely on hepatic structures.

There seems to be a considerable dearth of knowledge in regard to fat metabolism. However, indications point

to the fact that the liver plays a very important part in the preparation of fat for utilization by the tissues. This is indicated by the fact that in conditions where there is lack of other foodstuffs, the fat content of the liver is increased.

Regulations of Food Materials

Not only is it necessary that the cells of the body have a constant supply of food but the food which reaches them must be regulated to meet their varying demands. Undoubtedly hepatic activity is responsible in a large measure for the regulation of this tissue supply, especially in regard to the control of the concentration of glucose in the blood. This, if the organism is to function normally, must be held within certain limits. If not, when the concentration is above normal, glycosuria develops and, on the other hand, if it is below normal, hypoglycemia results. Not only is hepatic activity responsible for the maintenance of normal blood sugar values, but the hyperglycemias are also dependent upon the liver. This has been proved by Mann and his coworkers following the removal of the pancreas, etherization, and development of asphyxia. This mechanism, however, is not known, neither is it definitely known just how the supply of protein and fat is controlled and supplied to the tissues, but the liver plays a very definite role in both of these conditions.

The Secretion of Bile

Bile is formed by the hepatic cells and passed into the biliary system. This is secreted more or less continuously but its rate and its concentration varies a great deal depending upon factors which are not fully understood. So far as we know, bile contains cholesterol, bile salts, and bilirubin. The origin of cholesterol in the bile is not known. Under certain conditions, bile salts are formed and also destroyed in the liver. Bilirubin is formed from hemoglobin in the reticulo-endothelial cells found in various tissues of the body. The hepatic cells do not form bilirubin. Bilirubin sometimes is a waste product. The functions of bile are many. It serves to dilute and neutralize the acids of the stomach which reach the duodenum. It is also necessary for the breaking up of fats. It seems to be a definite, special aid in the absorption and functions of some of the important vitamins.

The liver is known to be instrumental in the formation or storage of vitamins A, B_1, the B_2 complex, C, and D, and, of course, you must appreciate that any injury to the parenchyma of the liver would necessarily disturb this function. Greaves and Schmidt have also carried on some experimental work and have shown there is a very definite relation between the absorption of bile and the absorption of very important vitamins A, B, and D complex.

Detoxicating Function

Aside from the secretion of bile, the storage of glycogen, the formation of urea, the liver also has a detoxicating function. Many toxic substances gain entrance into the body through the intestinal tract and other mucous surfaces. Some are formed within the body as a result of faulty metabolism, others are the product of infectious agents. It is quite definitely understood that the liver functions as a barrier for many of these harmful substances. However, whether the liver converts a specific toxic substance into a non-toxic one, is very difficult to prove. Drugs, such as strychnine and nicotine and other foreign substances are toxic in nature and are held in the liver for a certain period of time and then released in amounts so small that the injurious effects are spread out over a longer period of time, thus eliminating the danger of any overwhelming load of these harmful agents being thrown out into the system at one time.

The liver also, in some way, plays a role in the metabolism of water. It undoubtedly stores a large amount of blood. It is probably the place of origin of plasma-proteins, or the substance from which these originate. It is essential for some of the factors necessary for the coagulation of blood, and probably is the site of origin of thrombin, prothrombin, and fibrinogen.

My purpose in this paper is not to go into unnecessary details in the consideration of liver physiology and liver pathology, rather, I am endeavoring to bring out some very pertinent facts in successful gall-bladder surgery by having a clearer understanding of certain basic physiologic principles and pathologic processes of the liver.

Pathology

I do not propose to discuss the pathology of the liver in general, rather, for the sake of brevity, I am going to deal with some particular phases of pathologic change that have to do with the subject under discussion.

There are four common causes of liver disease:

1. Disturbance in portal circulation,
2. Obstruction to the biliary passages,
3. Presence of some toxic substance, and
4. Infection.

All pathologic conditions in the liver are manifested by disturbances in the normal contour of the capsule.

Most pathologic changes of the liver are also noted by very particular objective symptoms, two of the most marked of which are:

1. Jaundice, and
2. Hemorrhage.

Jaundice. Experimental work by Mann and his coworkers has shown that on hepatectomized dogs the liver was the excretory organ for bilirubin. Hyperbilirubinemia may be expected in three general types of disturbances:

1. Where bilirubin is produced in excess of the capacity of the normal liver to excrete it,
2. Where the liver cells are damaged so that they cannot excrete the normal amounts of bilirubin coming to them, and
3. Where obstruction of the bile passages causes regurgitation of bilirubin into the blood stream.

So far as we are concerned in this paper, I am only considering the obstructive type of jaundice caused by occlusion of the bile passages. We know that the liver has great powers of regeneration, but investigation has proved that repair and regeneration of the liver is im-

possible in the presence of obstruction to the bile ducts. Repair of the liver is not possible in the face of some toxic substance where the liver is daily insulted by its presence. I have reference particularly to alcohol. I feel that the general trend at present is to appreciate more and more the harmful effect of the continued use of alcohol and any liver damage suffered from its use cannot be repaired in the continued presence of this substance. Both obstructive jaundice and chronic alcoholism lead to hepatic necrosis.

Hemorrhage

It has been a well established fact for some time that hemorrhage associated with liver disease may result from two definite and distinct causes:

1. That which results from rupture of collateral circulatory channels, and
2. That which results from some changes, intrinsic, in the coagulating properties of the blood.

The first cause I am eliminating as not being pertinent to this paper. The second is extremely interesting because of the recent work by Quick, in which he holds that the essential factor is probably a deficiency of prothrombin in the blood. I feel that his theory is quite generally accepted, and one factor necessary for the maintenance of a normal prothrombin level is the presence of bile in the bowel.

Dam and his co-workers noted that numerous internal, subcutaneous, and intramuscular hemorrhages developed in chicks fed on a diet deficient in certain fat soluble compounds. These hemorrhages occurred in spite of the fact that the diet otherwise was entirely adequate and normal in respect to vitamins A, B_1, B_2, C and D. He proved his theory by feeding these chicks a substance found in the unsaponifiable, nonsterol fraction of hog-liver fat and in alfalfa. This substance promptly relieved the hemorrhagic tendency and he designated it as vitamin K.

Thus we see that there are two vital factors which are known to be of importance in the maintenance of the normal prothrombin level:

1. The presence of bile in the bowel, and
2. A hypothetical fat soluble vitamin.

The conclusions of importance among the various investigators indicate the following:

1. The hemorrhagic state associated with disease of the liver is attributable to a deficiency of prothrombin, which in turn is attributable to failure of absorption or utilization of some substance normally present in the diet which required bile for its absorption.
2. This substance may be the hypothetical coagulant vitamin K.
3. Additional toxic factors may deplete the supply of prothrombin which occurs in certain diseases such as necrosis of the liver.

From the clinical viewpoint, the administration of extracts of bile and bile salts to patients who have jaundice, has rapidly reduced the prothrombin time to a point within normal limits and, in certain cases, has prevented hemorrhage or relieved actual bleeding. Administration of bile alone to an individual who is ingesting a normal diet has also resulted in shortening the prothrombin time.

Resume and Application

To me the significant points brought out by these investigators and their conclusions as the result of these studies lead to two very pertinent points in regard to the handling of surgical conditions involving the gall-bladder tract, namely: the very definite importance of the liver as a detoxifying and as an anti-hemorrhagic organ.

Until the recent experimental work by Dam and Smith showed us definitely that the so-called prothrombin element of the blood was the important factor in the prevention of bleeding, we were at a loss to understand why patients who were jaundiced, or who had some severe hepatic insult, had a tendency to bleed three or four days after operation. However, now, by their investigations this has been clarified. We now know that the cause of prothrombin deficiency is due to:

1. Diet, where there has been an excessive storage of fat or in the alcoholic, in which the liver has suffered a definite damage and thus, its function for storage of vitamins A, B_1, B_2 complex, C, and D is definitely impaired.
2. Where there is inadequate intestinal absorption such as the lack of absorption of bile in the intestinal tract due to obstruction of the bile ducts.
3. The result of inadequate intestinal absorption as the result of surgical procedure or where there is blood in the stomach or intestinal tract.
4. In severe diarrheas. Damage to the liver. Prolonged obstruction causing a so-called fat necrosis. An excess of fatty deposits in the liver and finally a low glycogen content.

To correct this condition then, and to eliminate the incidence of hemorrhage, we must have

1. A liver that is capable of function,
2. A normal absorption surface in the gastro-intestinal tract—if the intestinal tract is filled with clotted blood this will prevent normal absorption,
3. The presence of bile, and
4. A diet rich in carbohydrates and Vitamin K.

The first condition can be met by preoperative preparations. Experiments by Opie and Alford have shown that a high intake of carbohydrate has a very definite protective effect against hepatic necrosis. Their practice was to give a diet of 350 Gm. of carbohydrate to 1.5 Gm. protein for each kilogram of body weight. They also administered, in the form of syrup, jellies, jams, candy, and sweetened fruit juice, additional carbohydrates. They found that there was no great advantage of giving glucose by vein of the patient could take this diet by mouth.

If their conclusions are correct, this is very pertinent because a diet rich in carbohydrates and fat free should be administered for a variable period of time before sur-

gery. This is done so that the glycogen content of the liver may be increased. As we have noted in a previous paragraph, there is a reciprocal arrangement between the glycogen and fat content of the liver. The fat can be displaced by glycogen, and the liver with a high fat content stands the shock of surgical procedure very poorly.

Second, the administration of vitamin K, or frequent blood transfusions accompanied by the free exhibition of bile salts will often bring the prothrombin time to normal. We feel that no jaundiced patient should be submitted to surgery who has a prothrombin clotting time of 35 seconds. Lavage of the intestinal tract should be instituted, if blood is present.

We feel that liver damage can be corrected to a considerable degree by the application of the above principles and temporarily withholding surgery on all patients who are seriously ill with an acutely inflamed or gangrenous gall-bladder. Diarrhea, if present, should be checked as frequent stools prevent the free absorption of bile from the intestinal tract.

Until recently here on our service in St. Joseph's Hospital, we have had no definite method of measuring the prothrombin time. However, for several years, we have been alert to the extreme necessity for very definite preoperative care on all patients who are suffering from an acute gall-bladder infection, especially if they are fat or jaundiced.

Our procedure has been to hospitalize these patients for several days before submitting them to surgery. During this time, they are kept in bed and given large doses of glucose by mouth, in the form of Karo corn syrup if they can retain it. If not, glucose is given intravenously. In addition to this, they are kept on a fat-free high carbohydrate diet in the form of jams, candy and the like, and in a general way an effort is made to load them up on glucose. An ice bag is applied to the abdomen. If they are in pain, they are given nitroglycerin and if necessary, small doses of morphine or amylnitrite. Surgery has been withheld in all acute gall-bladders until their temperature was normal or definitely receding, and until such time as we felt that the glucose content of the liver was relatively high.

We feel that surgery is contra-indicated in all acute gall-bladders, especially if they are overweight or if they are jaundiced, or if they are running a temperature. I believe following this procedure, they withstand surgery much better and so far as I can see there is no indication for an immediate operation in any of them. I have operated a very large series of gall-bladders and I have never found the gall-bladder perforated into the general peritoneal cavity. Lahey of the Lahey Clinic reports operating 3,000 gall-bladders without ever seeing a perforation, so I feel that the danger of a perforation is very much overestimated. Again by waiting, in some of these patients who have a stone in the duct, this stone may pass and thus eliminate the necessity of opening the common duct.

All patients who are jaundiced receive blood transfusions before operation. If they have a tendency to bleed, frequent postoperative transfusions are also given. At the present time, we propose to check all postoperative jaundiced patients daily for a prothrombin clotting time. Should it rise above 30 seconds, we feel that a transfusion is indicated at once. Transfusions furnish definite prothrombin for the patient which lasts from forty-eight to seventy-two hours.

In all jaundiced patients who have been operated upon and who have a tube drainage in their common duct, we have their bile collected in a sterile bottle from the drainage tube. This bile is fed back to them through a Lavine tube. Many of them take it by mouth without apparently any distaste, especially if it has been kept on ice for a short time. I have given some of these patients by this method as high as 1,000 cc. of bile daily and this procedure has, in our hands, worked very satisfactorily.

In a study of the last 225 patients operated upon in our service, here at St. Joseph's Hospital, over the last two years, we have carried out 234 surgical procedures. Two hundred and eight of these operations were cholecystectomies, 78 per cent of which had stones in either the gall-bladder or the common duct, or in both. Twelve operations were carried out on the common duct, where the gall-bladder had been previously removed, and this was done either for residual stones or stricture in the duct. Seven patients were operated upon for simple drainage of the gall-bladder, for pancreatitis or for some allied condition. Five patients were operated upon who had a very acute condition, and a simple drainage of the gall-bladder was carried out because it was felt that radical procedures in these cases were unjustifiable. Two patients, who had cholecystectomies, developed extensive postoperative bleeding from the gall-bladder bed. These were reopened and a strip of rectus muscle was sutured into the gall-bladder fossa. In both instances, the hemorrhage ceased and the patients made an uneventful recovery.

As to anesthetics, we feel that ether should not be given in gall-bladder surgery, as it is very harmful to the liver, producing an increase in the prothrombin clotting time, and it has a tendency to damage the liver function. In about 8 per cent of these operations, we have used local anesthetics entirely. The balance have been done with ethylene or cyclopropane. Occasionally, if the patient is large and does not relax, we may give him a small amount of ether.

Where common duct drainage is established, a catheter (No. 12 to 14 preferred) is sutured into the duct snugly. It is kept in place for from one to six weeks. If the closure is tight, after the first week we clamp the tube off and allow the bile to run into the duodenum, providing the temperature is normal and there is no evidence of infection.

In this series of 234 surgical procedures on 225 patients, we have had five deaths. Two patients who had common duct drainage for gangrenous gall-bladder with stones in the duct, and biliary cirrhosis, died from hemorrhage 17 and 23 days respectively, after operation. These deaths occurred in spite of repeated transfusions.

Postmortem findings on one of these showed a definite fat necrosis of the liver. Another patient had apparently been getting along satisfactorily but died suddenly of a coronary attack ten days after a second operation. The fourth patient had cirrhosis of the liver at the time of operation and died six days after operation of hepato-renal shock. The last patient was a large woman with a very acute gall-bladder, and she died, postoperatively, during my absence from the city. From her symptoms, I think she, also, died from hepato-renal shock. However, no postmortem was obtained.

Conclusions

1. In order to secure the best possible surgical results in operations upon the gall-bladder tract, the recognition of certain physiologic principles and pathologic processes is absolutely essential. Evaluation of the risk must depend upon this recognition.

2. Application of preoperative treatment based on an understanding of these principles is essential.

3. Withholding surgery from the acutely ill, jaundiced patients until a prothrombin test can be made and measures adopted to correct any abnormalities that may be manifested in the blood as interpreted by these tests is also important.

4. Accurate, definite, scientific postoperative care should include administration of vitamin K together with whole bile or bile salts, and blood transfusions when indicated.

Eye Health Among College Students*

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WE are to consider now the general topic of eye health. This is an excellent term because it is so inclusive and by the same token the topic of eye health is difficult to discuss because of its scope. Although we recognize that we are dealing primarily with hygiene, we must include factors of anatomy and physiology. Because of the nature of our work, our interest naturally must be focused upon the college age group.

The development of the eyes is most interesting. The eye is one of the first parts of the embryo to show differentiation. It is developed from neuro-ectoderm while the extraocular muscles and other appendages are developed from mesoderm. At birth the eyes are fully formed but far from mature. The eye is smaller and less spherical. Full size is not reached until about the ninth year. However, the lens of the eye continues to increase in size until about the twentieth birthday and its index of refraction continues to change for the remainder of life.

Functionally, the eye is just as interesting. At birth an infant has light perception but no demonstrable vision. The mechanism of seeing must be developed. The retina of the eye is not fully developed. Its point of greatest sensitivity has not been differentiated as yet. All of us have noticed the dull stare of the newborn. By the third month the macula, or point of greatest sensitivity of the retina is fully developed. When the macula has developed distinct vision is possible. The sensitivity of the retina rapidly decreases from the macula to its periphery. Ocular movements depend upon fixation and until the macula is fully developed an infant's eye may be very divergent purely because the two eyes do not focus upon the same object. Through constant use the infant develops fusion and the function of the eyes becomes more specialized. The efficiency of the eyes depends upon:

a. transparency of media (i. e., cornea, aqueous humor, etc.)
b. regularity of refractive surfaces.
c. proportion of curves of these surfaces to the length of the eyeball.
d. high sensitiveness and adaptation of retina to light.
e. connections and coördination of the percipient elements of retina with the visual and motor centers of the brain.

Naturally, all parts of the eye are important but we must never forget that sight and light together give us vision. Without one or the other, vision is impossible. It is light that we are particularly interested in because it is a factor that we can control much more readily than sight as such.

Light enters the eye primarily through the pupil but it also enters through the sclera. Scleral illumination improves visual acuity and has an influence upon the appearance of colors. However, the light that enters the eye through the cornea and then through the pupil is of primary importance in vision. These rays of light are refracted by the various surfaces of the eye and

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brought to a focus on the retina. The function of the retina is the conversion of light into nerve impulses capable of transmission through the optic pathways to the visual area of the occipital lobe of the brain. As soon as light strikes the retina, we have structural, chemical and electrical changes taking place. There is migration of the pigment granules in the retina with an actual change in the shape of the cones. The visual purple (rhodopsin) is changed to visual yellow and during recovery the visual yellow is changed back to visual purple. In this process vitamin A plays a part although its exact role is not known. The energy necessary in this process is supplied directly by lactic acid. Electrical action currents are produced in the retina and optic nerve and the nerve impulses are finally interpreted in the occipital lobe about the calcarine fissure.

In the normal or emmetropic eye all parallel rays of light are focused upon the retina without effort. All other rays are focused upon the retina through the action of the mechanism of accommodation. This mechanism provides for clear vision of near objects. The focal length of a healthy normal eye among college students is flexible within reasonable limits. Through a complex mechanism working upon the lens of the eye, all rays of light are clearly focused upon the retina.

Unfortunately, all eyes are not so-called normal or emmetropic eyes. The eyes that are not emmetropic are designated as ametropic. There are three main types of ametropia:

1. *Myopia* or so-called nearsightedness. In these eyes the dioptric system is too strong or the eyeball is too long.
2. *Hyperopia* or so-called farsightedness. In these eyes the dioptric system is too weak or the eyeball is too short.
3. *Astigmatism*—inequality in the refractive surfaces in cardinal axes. Astigmatism may be: (a) *simple hyperopic* — one axis emmetropic and the other hyperopic. (b) *compound hyperopic* — both axes hyperopic, but unequally. (c) *simple myopic*—one axis emmetropic and the other myopic. (d) *compound myopic*—both axes myopic, but unequally. (e) *mixed*—one axis hyperopic and the other myopic. (f) *irregular*—uneveness of surfaces of cornea.

We also include a fourth major type of visual defect and that is double vision.

Each visual defect presents a different problem. Theoretically hyperopia, myopia, and astigmatism of low degree are no problem. Double vision is always a problem. Actually hyperopia and astigmatism are a constant problem in the college group while myopia is always potentially dangerous. Fundamentally, all of these cases deserve the attention of an ophthalmologist.

Now why should we be particularly interested in eye health? You may say that there is no obvious special problem among students because studies show that more cases of visual defects are found in the upper scholastic level of students. Studies have also shown that the increase in visual defects during the four years in college exceeds that in the same age level outside of college. To me this is a real reflection upon colleges and universities and represents a definite occupational hazard that should not be neglected.

The problem falls into two main categories. First, all factors outside the student himself; and secondly, all factors intimately associated with the student. In the former, we include lighting, special hazards as chemistry, ceramics and engineering laboratories, general sanitation on the campus and ventilation and heating of the college plant proper.

From a practical point of view, we cannot expect rebuilding of old buildings. However, we can insist on proper lighting, ventilation and heating of all new buildings. We can reduce to a minimum all hazards in laboratories. We can also make a survey of all lighting in the university buildings, including the library and dormitories and work out methods that will give proper light to students. The program at Marquette University is proof that this can be done. The method of survey at the Universiy of Illinois can be used as a model anywhere. The National Society for the Prevention of Blindness has prepared a simple but most effective leaflet that summarizes "Good Study Facilities for College Students":

1. Ratio of general to desk illumination not greater than 1:5.
2. Minimum intensity of ten-foot candles on working surface.
3. Dull desk surface without glare.
4. Desk top at least 30 x 40 inches.
5. Light-toned—not white—dull finish walls and ceiling.
6. Lamps with concealed light bulbs.
7. Lamps placed behind the shoulder line.
8. Lamps in which height of filament from floor is 60 inches.

We should also add that more harm is done by light that is too bright than by light that is a bit too dim. Ultra-violet light is especially harmful. This must be remembered because of the extensive use of ultra-violet light in the treatment of various ailments.

Now what can we do with the student? In order to plan our program, we need an examination. Fortunately, the college entrance examination is a fixture and we need but make use of it. With the acquisition of new knowledge we are constantly reminded of the value of a good history with particular reference to injuries, examinations, glasses, and symptoms of eyestrain. So-called "weak-eyes" and squints do have hereditary characteristics. Hereditary and congenital conditions of the eyes that we cannot control are interesting, it is true, but practically, their interest is for the ophthalmologist and not for the student health physician. We should be primarily interested in the factors that we can control. When we have done this effectively, then we can indulge our fancies in the medical oddities.

In the examination, we should note particularly the student's general attitude, how he carries his head, the facial expression, symmetry of skull and orbits. Many

cases of muscle imbalance, inequality of vision, and visual errors can be detected at this time. The examination of the lids for ptosis is quickly made while the examination of the conjunctiva, puncta, and culdesac, and lacrimal apparatus need take but a few minutes. The tension of the eyes can be roughly taken by palpating the eyeballs. Now we can check the motility of the eyes by having the eyes follow a small flashlight or the finger through the four quadrants (at a meter distance) and then test convergence by carrying the light towards the nose. This test will also reveal gross muscle imbalance. Inspection of the cornea and anterior chamber is most worthwhile if for no other reason than to inspect the iris and the pupil. The field of vision can be estimated quite accurately with a small flashlight and muscle balance can be tested either by the "cover" test or with a Maddox rod. The latter is preferable.

Testing visual acuity is important. If glasses are worn eyes should be tested both without and with glasses. This is a functional test and tells us what the eyes can do. Because it is a functional test it is subject to all the variations found in comparable tests on other parts of the body. Because of these variations we have had developed more visual testing apparatus than we can possibly use. The Snellen Chart is still the standard and if properly illuminated it will give the best results. There is no question that the telebinocular is handier but we have found a high percentage of inaccuracy in spite of the fact that it is based on the more natural principles of optics in that light is projected in the form of a cone and is reflected on the retina as a circle. In the Snellen Chart the projection is in rectangles. The telebinocular can be used to advantage during mass examination but after that it is much wiser to use the standard Snellen Chart. The telebinocular is only a visual testing chart and not a diagnostic instrument—as it has been used. If it is used as an initial screen to be followed with a check of the Snellen Chart it can be used to advantage. The illumination of the chart must be uniform and not in excess of 12-foot candles nor less than 8-foot candles. If the illumination is too bright "after images" will form and will seriously interfere with the testing of the visual acuity. (To illustrate—if we look at the setting sun and then look at the landscape we will see a dark image. This is due to the fact that a part of the retina became adapted to the light from the sun and when we looked elsewhere it did not respond. This is a negative "after image." Now if we close the eye we see a bright spot representing the sun. This is a positive "after image.")

Visual acuity may be expressed in feet or in meters. The chart should be 20 feet or 6 meters from the patient. Naturally, 20/20 vision is considered normal. Anything over 20/30 deserves prompt attention. It is a waste of time to try to determine hyperopia, myopia, and astigmatism from the visual acuity test. However, the fogging method can be used effectively in detecting the hyperopes of low degree. A convex lens of .75 diopters is the most useful. In my humble experience this is the method of choice.

The muscle balance can be tested with the telebinocular if that instrument is used. If the standard method is used then we need the Maddox Rod and focus the eyes upon a small spot of light. If the cover test is used, a small occluder on a long handle is necessary.

As a rule, college students have excellent accommodation but in spite of this there is value in testing the near vision. This can be done with any small print or preferably with the standard near vision chart. The Prince Rule may also be used.

The testing of color sense is of more value to the students than to us. There are many methods used but the Ishihara tests offer definite advantages. We must be careful not to confuse color ignorance with color blindness. The findings of this test should be considered when the student makes his choice of curriculum. Color blindness is a definite handicap in ceramics, landscape gardening, geology and chemistry. If there is only color ignorance much can be done.

This completes the routine examination that can and should be done. Now what should we do with the findings? First of all, go over all records and check the findings. Students having at least 20/30 vision in both eyes with no demonstrable abnormality and giving no history of difficulty, need not be asked to return for a check-up. All other students should return for a more careful re-examination. A certain number will have normal visual acuity at the second visit. This can be explained with difficulty if the testing was carefully done.

At the re-examination, the eye history should be discussed including the data on refractions and glasses. The visual acuity should be checked for distant and close vision. An ophthalmoscopic examination, and if indicated, visual fields should also be done with a perimeter. If the visual acuity is less than 20/30 in both eyes, with glasses if they are worn, a complete refraction is indicated. In the case of various pathological conditions each should be managed as indicated. In the case of squint there is relatively little that we can do in the student health service. The age of the student usually precludes successful orthoptic training. The patient certainly should be under the care of an ophthalmologist.

Now we should briefly consider the eye health program during the year. At about the time of the first examination period, we see students complaining of "eyestrain." The symptoms they give are the classical ones associated with asthenopia. The most common ones are tiredness after reading, sleepiness, blurred vision, photophobia and pain over eyes. Headache is not the most common symptom but if there is a definite time relation to the use of the eyes it is practically diagnostic of a refractive error and if associated with dizziness it suggests muscle imbalance as well.

These cases are extremely interesting because they invariably fall into one of three categories, namely:

1. General and local fatigue due to too much reading —usually under poor conditions.
2. Reading on trains while commuting.
3. A refractive error.

In all types the case should be discussed. In the first group, the visual acuity usually is normal and there is no indication of hyperopia. In the second group, the

bulbar and palpebral conjunctivae are invariably injected and sensitive to light. In the last, there is usually a deviation from normal visual acuity or there is evidence of hyperopia.

The first two groups can be managed by the student health service. The last should be referred to an ophthalmologist, for a thorough refraction under a cycloplegic (drops). We should teach the students the reasons for this type of refraction, because improper glasses may have an effect upon the nutrition of the lens and thus may influence the development of lens opacities. Usually glasses are needed in the last group of cases. We say that there are three main reasons for wearing glasses: (1) to protect the eyes; (2) to see well; and (3) to avoid strain.

When necessary, glasses should always be worn. It should be stated that a thorough refraction is only a thorough eye examination and as such it is indicated in all questionable cases. A refraction does not necessarily mean glasses.

We should interest ourselves in the "eye" hazards in the various laboratories. Engineering laboratories are a frequent source of foreign bodies. Any foreign body is potentially dangerous. It should be removed properly under local anesthesia. For this cocaine should not be used because it makes the cornea too soft. Pontocaine or holocaine are to be preferred. If the foreign body is under the eyelid, it can be quickly removed from the everted lid. If it is on the cornea, the problem is greater. Never attempt to remove it without proper illumination from a condensing lens and proper magnification with a loupe. If it can not be removed with a wisp of cotton, it deserves the attention of a specialist. Chemistry laboratories also have hazards. Chemical burns are much too common. We should seek the coöperation of chemistry instructors. It is a wise rule to quickly flush all eye burns (chemical) with copious amounts of plain water. Then send the student to the student health service. First degree burns may safely be treated with any bland ointment to prevent adhesions. More severe burns should be sent to an ophthalmologist.

At Rutgers University we are experimenting with goggles. We have supplied large goggles to one large group of students and so far we have had no case of an eye injury in the group wearing them, while in another or control group we have had several cases.

Drafting rooms also have a special hazard. At Rutgers eyestrain was particularly prevalent among these students until we discarded the old buff-colored drawing paper and introduced a light green paper. Since then the incidence of asthenopia is no higher than in other groups of students.

Among the sports, boxing has presented several severe injuries. Intraocular hemorrhage is quite common. It is our rule that participants must have good vision in both eyes.

Focal infection must be remembered. Ethmoiditis is especially dangerous because of the proximity of the eyes. Choroiditis and optic neuritis are frequently due to ethmoiditis. We have a case of choroiditis justapapillaris due to ethmoiditis.

Among girls, certain cosmetics also are a problem. All dangerous cosmetics seem to be under control but no doubt there will be dangerous newcomers in the future if we can use the past as a criterion.

Asthenopia, due to muscular fatigue, is relatively rare among college students. It is usually encountered in the older groups. In our work, we find it among graduate students. These cases are real problems and should be referred to ophthalmologists.

This discussion cannot be complete without mentioning the importance of nutrition. Even though college students are taller and heavier from year to year, there is much evidence to make us wonder if the diet of our students really is adequate. Soda fountain meals cannot be considered as the best. Poor nutrition will influence visual function. If poor nutrition is coupled with active athletic participation we will have a serious vitamin and chloride deficiency that will produce visual fatigue. We know that certain vitamins and chlorides are lost through perspiration.

In closing, may I stress the following points?

1. Every college and university can and should institute an Eye Health Program.
2. The facilities of every student health service are adequate for a good eye health program.
3. The services of a consulting ophthalmologist are essential.
4. "Eyestrain" can be reduced by proper lighting in dormitories, libraries, laboratories, and classrooms.
5. "Eye" hazards should be eliminated or reduced to a minimum.
6. Good hygiene and proper study habits are essential.
7. A careful examination of eyes upon entrance is necessary.
8. Eye symptoms are the most important subsequent guides for referring students for further examination. It must be remembered that the visual acuity test is a test of function and as such it can give no more information. A refraction under a cycloplegic is to be urged in all cases of asthenopia.

Discussion by LeGrand H. Hardy, M.D.

Doctor Kler has given an excellent introduction to the subject of student eye health and eye examinations. It is very regrettable that there is so little standardization of these two phases of student health.

Your advisory committee has outlined a visual appraisal form which it is hoped will be used by a larger and larger number of health officers each year. If it is so used a great advance in uniformity will have been made and we will be able to collect comparable statistics leading to further progress.

We must not forget that the visual appraisal form is not an outline of a complete eye examination and is not intended as such. It is a guide to be used in conducting "weeding out" tests or "screening" tests to select those students who need more expert attention. We have kept it as clear and simple as possible. Many improvements are in order but if we can achieve standardization of only one factor in our test we will have made a great advance and more refinements in technic and materials will quickly follow.

Blood Transfusions in Pediatrics*

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BLOOD transfusion as a therapeutic procedure is no longer a major surgical problem. In fact, in recent years, it has become a routine measure in the treatment of varied conditions. An attempt to evaluate the beneficial effects of blood transfusion is difficult. Each physician has his own indications and is entitled to his own opinion.

Transfusion in the adult patient is usually performed with ease. In children, particularly young infants, the administration of blood often presents technical difficulties which deter many physicians from intravenous transfusion when it is badly needed. Pathological conditions in childhood are prone to induce more marked blood alterations than in adults because in childhood there is a frequency of vomiting, diarrhea, and perhaps a less mature blood regulatory mechanism. It seems to us, therefore, that a critical discussion of blood transfusion in childhood is pertinent. An analysis was made of all blood transfusions performed in children's wards at the Minneapolis General Hospital during the years 1920 to 1940. The age range varied from newborns up to 14 years. The methods used, some of the physiological principles involved, and a consideration of past and recent developments as regards blood grouping and transfer are considered.

Modern transfusion is the result of investigations of many men since the discovery of circulation by Harvey[1] in 1616. With the knowledge of asepsis and antisepsis, immunology, coagulation and anticoagulation, blood grouping and cross-grouping, incompatibility and reactions, indications and contraindications, agglutination and hemolysis, physiology of the blood and heart, and the invention of innumerable equipments, blood transfusion has been placed on a rational and safe basis. Reactions and occasional fatalities still testify to carelessness, lack of understanding, or inadequacy of our knowledge. Further studies are required before the many phenomena which take place when blood is transfused from one individual to another can be explained.

Blood Groups

Landsteiner's Principal Blood Groups. As a result of the investigations of Landsteiner,[2] Shattuck,[3] Decastello and Sturli,[4] Jansky,[5] and Moss,[6] blood from different individuals has been divided into four groups. Unfortunately Moss transposed groups I and IV of Jansky's classification so that confusion might result from the use of their classifications. To avoid this confusion, it has been recommended that Landsteiner's classification utilizing the presence or absence of agglutinogens in the blood cells be adopted for international use. A recent questionnaire survey of 350 hospitals in the United States by Levine and Katzin[7] disclosed that the Moss classification was used in 70 per cent, international (Landsteiner) in 23 per cent, and Jansky in 16 per cent.

For the sake of clearness, the classification, composition, and frequency of the blood groups in the United States, as well as a scheme of the agglutination reaction are presented in tables I and II.

Subgroups of Group A and Group AB. Von Dungern and Hirzfeld[8] in 1910 and Landsteiner and Levine[9] in 1926 disclosed that subdivisions in Group A and Group AB occur possessing the agglutinogens A_1 and A_2 which differ in sensitivity in the following order: $A_1 > A_1B > A_2 > A_2B$. The existence of the corresponding different agglutinins α and α_1 in the serum is generally agreed.

Development of the Blood Groups. Kemp[10] has shown that the agglutinogen could first be demonstrated in the red blood cells of the 37 day old fetus and that the sensitivity of the cells to agglutination increases up to the age of 20 years postnatally. Thomsen and Kettel[11] found that the agglutinins are generally not developed at birth, but rapidly increase in titer up to puberty. Half of the newborn infants, however, have been shown by Hirzfeld[12] to possess demonstrable agglutinins. He stated that this was derived from the mother via the placenta. That this is true was demonstrated by Smith[13] who found that the agglutinins present at birth diminished or disappeared by the tenth day of life, after which the infant produced its own agglutinins. Moreover, Polayes, Lederer, and Wiener[14] from a study of 500 maternal and 500 cord bloods found that blood groups were well defined in newborns, that cord blood did not contain agglutinins specific to the mother's cells, and that 25 per cent of cord bloods were incompatible with blood of their mothers due to agglutination of cord cells by mother's serum and never vice versa.

Defective Blood Groups. Rare instances of blood lacking their full complement of agglutinogens and agglutinins have been cited.[15] This is particularly found in newborn infants.

Isohemolysis. The isohemolysins causing hemolysis correspond in specificity to the isoagglutinins. Therefore, sera of group AB never contain hemolysins, and group O cells are not hemolyzable. If the complement is destroyed no hemolysis occurs.

Rouleaux Formation (pseudoagglutination). Rouleaux formation is not an uncommon occurrence in blood matching. Since the use of sulfanilamide and related compounds, our observation seems to indicate that the frequency of this phenomena is increased with the use of these drugs. Although fatalities have not occurred, marked rouleaux blood gives rise to reactions which may be undesirable. Wiltshire[16] investigating the cause of this phenomenon, found that the main factors favoring

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TABLE I.
Classification, Composition and Frequency of the Blood Groups

International (Landsteiner)	Moss	Jansky	Cells (agglutinogen)	Serum (agglutinin)	Frequency in United States
O	IV	I		α & β	43%
A	II	II	A	β	42
B	III	III	B	α	10
AB	I	IV	AB	—	5

TABLE II.
Scheme of Agglutination Occurring with Blood Groups

Serum of Group (Recipient)	Red Blood Cells of Group (Donor)			
O	—	+	+	+
A	—	—	+	+
B	—	+	—	+
AB	—	—	—	—

+ signifies agglutination. — indicates no agglutination.

the occurrence are high temperature and concentrated sera. He stated that it is due to surface tension phenomena induced by substances present in the patient's serum. The nature of these substances is not known but Fahraeus[17] and Reimann[18] attributed it to increased serum proteins.

Cold Agglutination. Landsteiner and Levine[9] have described two kinds of cold agglutinins which act only at low temperatures. Since the cold agglutinins cause agglutination of the red blood cells from individuals from whom sera were derived, these are also called autoagglutinins. In certain pathological conditions, such as paroxysmal hemoglobinuria, syphilitic cirrhosis of the liver, hemolytic icterus, and Raynaud's disease, trypanosomiasis, and severe anemias, the autoagglutinins may be increased so that agglutination may occur even at room temperature.

Panagglutination. Hubener,[19] Schiff and Halberstaedter,[20] and Thomsen[21] observed that blood kept for some time became agglutinated by the addition of any normal human or animal serum, including that of the patient from whom the blood had been obtained. Friedenreich[22] found that this phenomena was caused by certain bacteria.

Agglutinogens M and N. In 1927, Landsteiner and Levine[23] observed that when certain immune sera from rabbits which had been injected with human blood were exhausted with samples of human blood, they still contained agglutinins acting on the majority of all blood groups, while other bloods were not agglutinated. They designated these agglutinogens M and N.

Heredity of Blood Groups. It has been determined by numerous investigators that the agglutinogens A and B and M and N are each inherited as simple Mendelian dominants. Thus paternity can be excluded in approximately 30 per cent of the cases. In a similar manner, in case of accidental interchange of infants, almost 70 per cent of the cases can be completely solved.[24]

Criteria for Selection of Donor

In pediatric practice, the parents are usually utilized as donors because they are most readily available. The following criteria should be used in the selection of donors:

1. Good health.
2. Blood compatible.
3. Age range, 16—45.
4. Males—more accessible veins and stand exsanguination better.
5. Emotional stability.
6. No communicable diseases — syphilis, malaria, measles, and smallpox.

To prevent the transmission of allergy passively and to avoid protein reactions, it is customary to instruct donors not to have food within three hours before transfusion.

Effect on Donor

It has been shown by various workers that with 500 cc. withdrawal of blood from healthy adult donors, no after effects result even after repeated bleeding provided that it is not done oftener than once a month. Probably the best rule to follow is to allow one week's rest for every 100 cc. of blood withdrawn. Martin and Myers[25] studied the effects of blood transfusions on ten donors and found that the average reduction in red cell count after 500 cc. withdrawal was 310,000 per cu. mm. which was regained in four to six days, the hemoglobin drop averaged 5.2 per cent (Sahli), initial weight loss was 1.5 pound, which was regained in two days, no change in bleeding and clotting time occurred, the blood pressure was slightly reduced but regained in six hours.

Use of Universal Donor

Since blood of group O contains no agglutinogens, Ottenberg[26] in 1911 proposed the use of donors of this group as "universal donors." He thought that agglutinins α and β were sufficiently diluted in the recipient's serum to be ineffectual. However, previous discussion of subgroups, agglutinogens M and N, and other agglutinins demonstrate that this may not be true in some cases. Severe hemolytic reactions and fatalities have been reported by the indiscriminate use of this type of donor. Levine and Mabee[27] showed that the dangerous "universal donor" may be detected by direct matching of blood.

Use of Same Donor

Repeated use of the same donor is often conducive to reactions if the blood is not carefully matched before each transfusion. In acute infections and sepsis, it is better to use different donors for each transfusion because less reaction results and better clinical response is obtained.

Viability of Transfused Red Blood Cells

It was formerly believed that the viability of transfused red cells was less than 30 days. By transfusing a patient with blood from another group, Ashby[28] found that viability extended up to 100 days. Others[29] have found viability extending from six weeks to four months.

Transfusion in Infants

Since agglutinins are absent in most newborn infants, blood transfusions have been performed in infants without preliminary grouping or matching. Such a procedure may lead to fatality since agglutinins may be present in some infants and the donor's agglutinins and hemolysins may not be sufficiently diluted so that agglutination or hemolysis of the infant's own blood may occur. Therefore, routine grouping and cross-grouping must be performed prior to transfusing an infant.

Prevention of Coagulation

There are two main procedures in preventing coagulation:

1. Rapid transfer or use of smooth surfaces simulating intima of blood vessel. Various devices have been invented to make this possible. In 1905, Carrel[30] anastomosed blood vessels of donor and recipient. Crile[31] used canula and tube, Curtis and Davis[32] paraffin coated glass tube, Lindeman[33] multiple syringes, and Unger[34] the syringe stopcock. The Lindeman and Unger apparatus are most widely used in pediatric practice for the transfusion of unmodified blood.
2. Use of anticoagulants. Satterlee and Hooker[35] in 1914 used hirudin. Hustin[36] in 1914 advocated sodium citrate which was popularized in the United States by Lewisohn.[37] Heparin has recently been advocated[38] because of its natural occurrence in the human body.

Cadaveric Blood

The use of cadaveric blood as reported by the Russians[39] is not practical in the United States.

Placental Blood

Rubin[40] in 1914 and Goodall, Anderson, Altimas, and MacPhail[41] in 1938 advocated use of placental blood. The average collected was 125 cc. per placenta. As a preservative Goodall and co-workers used a citrate mixture called "citro-seroid" supplied by the Moscow Institute of Hematology. Twenty-five cc. of this mixture in 100 cc. of distilled water is mixed with 125 cc. of blood. If carefully collected they state that cultures are not necessary because the low temperature at which the blood is preserved inhibits growth and attenuates contaminating organisms. They found the red blood cell concentration 7,000,000 or 150 per cent that of normal adult and the coagulative power was 20 to 35 per cent higher. Halbrecht[42] used isotonic sodium citrate as anticoagulant and preservative. The average amount of blood collected, however, was only 50 to 60 cc. This was kept at 4°C for 14 days. Forty-eight samples were tested for sterility and four contaminations with staphylococcus aureus were found. However, transfusion produced no harmful effects. One hundred sixteen transfusions were done from 520 placenta. Four reactions occurred. Page, Seager and Ward[43] had one severe reaction in 25 transfusions.

Preserved Blood

In 1918, Robertson[44] showed that citrated human blood can be bottled and preserved for as long as 25 days and be successfully transfused. The successful use of cadaveric blood by the Russians stimulated workers in the United States to find ways of preserving blood. Fantus and the Cook County Hospital[45] conceived of the blood banking idea which has now spread widely throughout the United States. Fantus stated that for a successful operation of blood banks an average of six transfusions must be performed daily. He advised that blood be used within 10 days. Giddings and Kreuger[46] reported analysis of 2241 transfusions of bank blood at the Kings County Hospital with an incidence of reactions of 7.3 per cent, 0.3 per cent contaminations, and 0.4 per cent clotting and hemolysis. No fatalities occurred. Fantus[45] in 962 transfusions stated that the incidence of reactions increased markedly after 12 days of preservation, being 8 to 16 per cent for blood 1 to 12 days old and 33 to 50 per cent for blood 12 to 22 days old. Erickson[47] found 2 per cent reaction with blood less than 3 days old, and 15 per cent reaction with blood up to 21 days old. Most places now use 0.35 Gm. of chemically pure sodium citrate in isotonic sodium chloride to each 100 cc. of blood.

Blood preserved for prolonged periods of time has in our hands given a high incidence of reactions. Co-Tui, Schrift, and Ruggiers[48] have found that pyrogens produced by nonpathogenic bacteria in gum acacia solutions may give rise to reactions when injected intravenously. Novak[49] has found that about 5 per cent of blood which had been stored for 10 days was grossly contaminated. The usual contaminating organisms were aerobic and anaerobic spore-forming rods and staphylococci, and occasionally pseudomonas and hemolytic streptococci. Novak further found that the addition of 20 mg. of sulfanilamide per 100 cc. of blood induced complete bacteriostasis against the usual contaminating organisms for a period of 15 days.

Belensky[50] reported that conserved blood undergoes in vitro biochemical and morphological alterations of destructive character terminating in complete loss of functional characteristics. He found less destruction occurred in dextrose-citrate solutions than in citrate-saline solutions, and the hemostatic effect in hemorrhagic diathesis was less with preserved blood.

McGowin[51] studied problems connected with preservation of blood for prolonged periods of time. He found that the best preservative mixture was blood 10 parts, 5.4 per cent glucose solution 13 parts, and 3.2 per cent sodium citrate 2 parts. The glucose prevented hemolysis. The potassium in the red blood cells diffused readily into plasma the first 10 days, then an equilibrium was established. The pH changed from 8 to 7 in 35 days. The red cells retained the ability to respire, fragility was little changed, prothrombin of plasma was not im-

paired at the end of 15 days. He also showed that transfusion of cold blood in 568 cases resulted in no reactions which can be attributed to this procedure. Since this preservative mixture entails too great a volume injection, it is not practical in pediatric practice.

Recently, Kolmer[52] has found that preserved citrated blood undergoes progressive deterioration in the various blood elements. Novak[53] has also found that the phagocytic power of the leucocytes is markedly diminished after blood has been preserved for 2 days.

Contrary to most reports, it is interesting to note that Lundy, Tuohy, and Adams[54] reported that in 2805 transfusions with citrated blood the incidence of reactions with fresh blood was 10.4 per cent, whereas with refrigerated blood it was 7.8 per cent.

From the foregoing considerations, therefore, preserved blood has its greatest usefulness in emergencies and convenience. In pediatric practice where usually graduated amounts of blood must be utilized according to the size and condition of the child, fresh blood is to be preferred whenever available.

Methods of Transfusion

Today all transfusions are done indirectly. Opinion is divided as to whether modified or unmodified blood is superior and therefore should be used. In our cases citrated method was used almost exclusively except in cases of blood dyscrasias and for purposes of instruction when unmodified blood was given by the Lindeman multiple syringe technique[33] or by the Scannell apparatus.[55]

Citrated Versus Unmodified Blood

A great deal of controversy has arisen over the relative merits or demerits of citrated over unmodified blood. The following are the criticisms advanced against the citrate method:

1. Sodium citrate is toxic. Joannides and Cameron[56] showed in their experimental studies on dogs that 0.2 per cent citrated blood was highly satisfactory in exsanguinated dogs provided that not more than 1 gram was used, which is the maximum safe dose for animals weighing between 20 to 40 pounds. They concluded that objections to the use of citrated blood as a transfusion medium in cases of exsanguinated human beings were unwarranted. Salant and Wise[57] showed that the toxicity of sodium citrate given intravenously into animals depended on the rate of injection. The fatal dose for animals varied from 0.4 to 1.5 grams per kilo. Toxic symptoms began at 70 mg. per kilo in the rabbit. They showed that sodium citrate rapidly disappeared from the circulation in 5 to 10 minutes after intravenous injection into cats and dogs. Cheer[58] and Gichner[59] showed in animal experiments that citrated blood even in concentrations of 0.4 to 0.5 per cent was not toxic.

Evidence both experimentally and clinically seems to indicate that sodium citrate as usually used in tranfusions is non-toxic. As Lewisohn[60] has pointed out the incidence of reactions with citrate is no higher than with unmodified blood if equal care as to details of technique is applied. Our experience confirms this statement.

2. Calcium immobilization. Our observations in 10 cases showed that following citrated blood transfusion in dosage of 20 cc. per kilo in children, the serum calcium is normal and the clotting time of the blood is not affected. Mellon, Hastings and Casey[61] stated that the purpose of the citrate is to render calcium unavailable for the formation of thrombin probably by tying it up in some undissociated form.

3. Disturbances in hydrogen-ion concentration. McGowin[51] showed that the pH of citrated blood stored for 35 days changed from 8 to 7.

4. Injury of platelets. Herr,[62] Agnew,[63] Belensky,[50] and Unger[64] have stated that the blood platelets are injured or destroyed. On the other hand, Lewisohn,[60] Lewisohn and Rosenthal[65] and Gichner[59] have argued that with the usual dosage of citrate, the platelets behave normally and are not diminished.

5. Changes in the fragility of the red cells.

6. Immobilization of the white cells.

7. Alteration of the hemostatic powers of the blood.

8. Development of anticomplementary properties of the serum.

9. Alterations of immunological reactions of the blood.

All these arguments have been advanced by various objectors to the use of citrate as anticoagulant. In spite of these unfavorable reports, however, the fact still remains that it is the most popular method in this country today. Its flexibility and convenience are its chief assets. It is our impression that in conditions of hemorrhagic diathesis, better results are obtained with unmodified blood. The methods used seem to us to depend more upon the skill of the operator and the facility with which the procedure can be carried out than the merits of one method over another.

Amount of Citrate to Use

Ten cc. of 2.5 per cent sodium citrate per 100 cc. of blood is used which makes 0.27 per cent concentration of citrate.

Routes of Transfusion

1. *Intravenous.*
   - A. Antecubital veins in older children.
   - B. Scalp veins in infants.
   - C. Internal saphenous at ankles. Place of choice in exposing a vein by dissection.
   - D. External jugular veins.
   - E. Superficial veins of foot or dorsum of hand.
   - F. Femoral veins are not recommended.
2. *Intrasagittal.* Helmholz[66] in 1915 advocated with sagittal sinus as a place of choice in infancy, but this method is no longer recommended.
3. *Intraperitoneal.* Siperstein and Sansby[67] showed that in rabbits, the red cells are absorbed when injected intraperitoneally. Sansby and Siperstein[68] stated that intraperitoneal transfusion of citrated blood gives good results in anemia of humans. No harmful effects were observed in 50 cases. However, its use in severe nutritional disturbance was questionable. They stated that the procedure was harmless, but this is seriously questioned by many pediatricians. Cunningham[69] showed

that blood cells may pass through the walls of the lymphatics in the diaphragm. Our findings in six infants, two of whom came to autopsy, showed that the blood was not absorbed at the end of 9 and 14 days respectively. In most of our cases of secondary anemia who received blood intraperitoneally, no rise in hemoglobin was observed one week following blood administration by this route. In cases where absorption is likely to occur, we have not yet failed to enter a vein directly. For these reasons, we feel that the intraperitoneal route should not be used.

4. *Intramuscular.* The intramuscular administration of blood has its usefulness in prophylaxis against communicable diseases, but otherwise the effect obtained cannot in any way measure up to the response obtained with introduction of blood directly into the circulation.

Amount of Blood to Transfuse

In infants, 20 cc. of blood per kilo is well tolerated. In older children 10 cc. per kilo is the usual dose. Halbertsma[70] stated that 15 cc. per kilo produced a rise of one million red cells in anemic children. Krahulik and Koch[71] recommended modification of Young's rule for dosage of drugs: Weight ÷ Weight+40, × 500 = amount of blood to transfuse.

Equipment Most Often Used

1. Citrate plus gravity.
2. Citrate with Unger stopcock-syringe method. Most frequently employed in infants.
3. Citrate and cutting down of internal saphenous vein at ankle.
4. Citrate with Lindeman multiple syringe method.
5. Unmodified blood and Lindeman multiple syringe method.
6. Unmodified blood with Scannell apparatus.

Special Types of Transfusions

1. *Autotransfusion.* This method is not practical in pediatrics.

2. *Exsanguino-transfusion.* Robertson, Brown and Simpson[72] stated that the rationale of this procedure is that the withdrawal of blood mechanically removes a certain amount of circulating toxins or bacterial infection and makes room for its replacement by fresh nontoxic blood containing fresh complement and possibly immune bodies present in adult normal blood. This procedure has been most frequently used in cases of septicemia and toxemia. Robertson[73] in 1921 advocated and used it with good results in the treatment of severe burns in infants and children. Lantin and Guerrero[74] reported good results in the treatment of 41 cases of typhoid fever. It has also been used in various forms of poisoning. It seems to us, however, that the risk to a child is too great to advocate this procedure over that of ordinary transfusion.

3. *Immuno-transfusion.*

A. Specific. In 1919, Wright[75] advocated use of donors who had been specifically immunized artificially to the organisms causing infection in the patient. Practically this procedure takes too long and is not available in diseases running a short course. Brady and Crocker[76] report good results in the treatment of septicemia.

B. Non-specific. This procedure is simpler and more rapid, consisting of immunizing donors with non-specific vaccine. It is based on the principle of increasing the formation of non-specific or specific antibodies or opsonins in the donor's blood. Fry[77] using streptococcus-staphylococcus vaccine in septicemia and wound infections stated that favorable results can be attributed to:

Antibacterial mass action.
Protein shock therapy.
Sensitization to vaccine.
Replacing hemolyzed red cells.

Bradford[78] using anti-pertussis immunized blood stated that it is effective in prophylaxis and during incubation but not during the disease. Barach[79] reported favorable results in pneumonia. Habel and Crocker[80] observed that in typhoid fever opsonins and non-specific immune bodies are increased. Gill[81] had good results in septicemia of otolaryngeal origin.

4. *Irradiated blood.* Hancock and Knott[82] in 1934 irradiated blood and then transfused. Each 10 cc. of blood was irradiated with ultra-violet light for 30 seconds. They stated that beneficial effects may be due to: (1) coagulation of bacteria creating an autogenous vaccine, (2) increase in germicidal properties of blood and antibodies, (3) secondary radiation causing stimulation of individual cells, hematoblast cells, and endocrines, (4) increase in vitamin D content of cholesterol and plasma, (5) increase in oxygen absorption of blood.

5. *Convalescent blood.* In the field of contagious diseases, convalescent blood often brings about rapid improvement with fall in temperature by crisis. This occurs with or without anemia. The immune body content of blood has been determined at various times but it has been always found to be less than the therapeutic sera which are on the market. However, in respect to safety and clinical response obtained, convalescent blood has certain advantages. Good results have been obtained with the use of this procedure in scarlet fever, pertussis, erysipelas, undulant fever, measles, mumps, and chickenpox. Its value in poliomyelitis is debatable, although it has been extensively used in the treatment of this disease.

Reactions and Complications

Polayes and Lederer[83] listed the causes of blood transfusion reactions as follows:

1. Incompatibility between donor's and recipient's blood due to:

A. Errors in grouping blood.
Poor or wrong technic.
Use of low-titered or contaminated test serum.
Weak agglutinins or agglutinogens in recipient's blood.
Pseudo-agglutination.
Auto-agglutination and cold agglutination.

TABLE III.
Transfusion Fatalities Reported by Various Authors

Author	Year Reported	No. of Transfusions	Fatality Per Cent
Bernheim[89]	1917	800	1.3
McClure & Dunn[90]	1917	150	1.3
Pemberton[91]	1919	1,036	0.3
Copher[92]	1923	245	0.8
Brines[93]	1928	2,500	0.0
British Red Cross[94]	1929	3,430	0.1
Tiber[88]	1929	1,467	0.1
Blain[95]	1929	3,000	0.0
Beck[96]	1930	2,500	0.0
Polayes and Morrison[97]	1932	1,500	0.6
Powers[98]	1937	313	0.0
Andrus[99]	1937	634	0.0
Lewisohn[60]	1937	723	0.0
DeGowin[87]	1938	3,500	0.2
Fantus[45]	1938	962	0.0
Lundy, Tuohy & Adams[74]	1938	2,805	0.0
Fell[85]	1938	500	0.0
Giddings & Kreuger[46]	1939	2,241	0.0
Berkley[100]	1939	1,800	1.3
Halbrecht[42]	1939	116	0.0
Sako & Stoesser	1940	1,846	0.1

TABLE IV.
Transfusion Reactions Reported by Various Authors

Author	Year Reported	Number of Transfusions	Pct. of Reactions
Meleney et al[101]	1917	280 (citrate & modified)	23.2
Unger[102]	1917	165	34.5 (citrate) 1.8 (unmod.)
McClure & Dunn[90]	1917	150	20.0
Sloan[103]	1921	436 (unmodified)	1.1
Blain[95]	1929	3,000 (unmodified)	0.3
Polayes and Morrison[97]	1932	1,500	2.8
Powers[98]	1937	313 (citrate)	4.5
Andrus[99]	1937	634 (citrate)	13.0
Lewisohn[60]	1937	723 (citrate)	1.5
Fantus[45]	1938	962 (citrate preserved)	13.5
Lundy, Tuohy & Adams[74]	1938	2,805 (citrate fresh and pres.)	9.4
Fell[85]	1938	500 (citrate unmodified)	17.6
DeBakey & Honold[104]	1938	1,500 (unmodified)	0.5
Giddings & Kreuger[46]	1939	2,241 (citrate preserved)	7.3
Cameron & Ferguson[105]	1939	1,000 (citrate preserved)	7.4
Halbrecht[42]	1939	116 (placental citrate)	3.4
Sako & Stoesser	1940	1,846 (citrate 1,678 unmod. 168)	1.6

Anomalous or atypical agglutination; subgroups. Contamination of recipient's blood by bacteria. Effect on blood groups of drugs.

B. Indiscriminate use of the universal donor.

C. Immune iso-antibodies and hemolysins.

2. Unclean apparatus.
3. The use of sodium citrate solution.
4. Incipient coagulative changes in the transfused blood.
5. Allergic reactions in the patient.
6. Systemic disease in the recipient. Overtaxing the heart and kidneys.
7. Transmission of disease to recipient, such as measles, malaria, syphilis, or smallpox.
8. "Speed shock."
9. Embolism.

Speed shock has been mentioned in the literature[81] but we have not encountered a case where this has occurred, although in some children transfusion was accomplished in 5 minutes. However, we have wherever possible given the blood at the rate of 5 to 10 cc. per minute.

Fell[85] lists four main types of reactions: (1) Shock and renal suppression due to incompatibility, (2) chills and fever due to protein reaction, (3) hyperthermia, (4) allergic.

DeBakey[86] as a result of experiences in 1500 transfusions of unmodified blood stated that the chief difficulties with this type of transfusion were: (1) agglutination, (2) coagulation, (3) infection, (4) introduction of needles, (5) clotting in needles and tubing, (6) clotting in the conveying intermediary.

DeGowin[87] reported 13 grave sequelae and 7 deaths occurring in 3500 transfusions as follows:

1. Renal insufficiency due to incompatibility—7 cases with 5 deaths. Alkalization of the urine before a transfusion is claimed to protect the kidneys from the excreted hemoglobin if hemolysis occurs.
2. Hemolytic reaction without renal insufficiency—5 cases.
3. Retinal hemorrhage—3 cases.
4. Pulmonary edema—2 cases with 2 deaths.

Tiber[88] collected 12,742 transfusions reported in the literature from 1917 to 1930 with a mortality of 22 or 0.2 per cent. Out of this, 13 cases were avoidable and 9 unavoidable (.08 per cent).

The incidence of fatalities and reactions reported by various authors is summarized in tables III and IV.

Causes of Fatality

The chief cause of fatality is carelessness. Among the specific causes mentioned in the literature are renal insufficiency due to incompatibility, pulmonary edema, cardiac failure, and accidents. In our series one death occurred as a result of pulmonary edema and one from sinus transfusion.

Physiological Effects of Blood Transfusion on the Patient

The various physiological effects which may be obtained by blood transfusion may be tabulated as follows:

1. Supplies fluid bulk. It has long been realized that in such conditions as surgical shock, isotonic salt solutions are of very little value because they do not remain in the vascular system long enough. Gum acacia having the same osmotic pressure as blood is somewhat effective in this regard but reactions and fatalities have resulted. Physiologically it is not as ideal as blood.
2. Supplies colloids and electrolytes, thus restoring hydrogen ion concentration, osmotic pressure, irritability, and stability of tissues.
3. Supplies cellular elements, leucocytes, erythrocytes, and platelets, thus increasing body defenses, oxygen carrying capacity, and coagulation of blood.
4. Stimulates various tissues such as hemopoiesis in the blood forming organs.
5. Supplies immunologic elements such as antibodies and opsonins.
6. Other physiological effects unknown at the present time.

Blood Volume of the Normal Child

Gallerani[106] studied blood volume of 92 normal children by the trypan red method. He found that the total blood volume averaged 60 to 90 cc. per kilo of body weight, the mean for the boy being 80.8 and for the girl 73.6. In males this was 0.086 of their body weight and in females 0.081 of body weight.

Shock

In shock there is a loss of fluid from the blood and exudation of colloids into the tissues. The administration of hypertonic glucose solution may help temporarily, but the most practical and physiologic treatment is the administration of blood. Often large amounts of blood are necessary by continuous infusion.

Hemorrhage

Eyster and Middleton[107] showed that hemorrhage and transfusion of blood in man in amounts within 1 per cent of the body weight result in only transitory alterations of cardiac size and blood pressure. Compensatory mechanisms cause a rapid readjustment to normal circulatory conditions notwithstanding the altered blood volume.

Diarrhea

Cooper[108] has shown that with acute diarrhea the serum protein, blood chloride, and non-protein nitrogen is elevated but with chronic diarrhea the non-protein nitrogen is normal but the serum protein and blood chloride are low. In the former case, water leaves the blood rapidly resulting in anhydremia, whereas in the latter condition the fluid remains in the blood much longer.

Anesthesia

Searles[109] showed that ether causes concentration of the blood due to exudation of fluid into the tissues and also causes the spleen to contract, putting out a reserve of blood elements. Stewart and Rourke[110] showed that ether anesthesia for one to three hours reduces the blood volume 13.4 per cent. Consequently, there is a rational basis for fluid administration before surgery, and transfusion pre- or postoperatively and during surgery.

Anemias in Children

Since anemia plays such a prominent part in pediatric practice, a detailed discussion is presented. The term may be defined as any state in which the hemoglobin is in less than normal proportion to the blood volume. The number of red cells may or may not be reduced in proportion to the hemoglobin deficit. Such a condition can arise from the following causes:

1. Direct blood loss, acute or chronic.
2. Failure of red cell formation due to:
   - A. Hypolastic states of the bone marrow. By this term is meant a condition in which the erythropoietic activity of the marrow is for the time being suspended, although capacity for function is still present, and when the cause of the hypoplasia is removed, return to normal is to be expected. This is the chief factor in the production of many of the secondary anemias of childhood, particularly those due to infection in which the toxins of the infectious process have a depressing effect on the marrow. This condition also accounts for anemia accompanying malnutrition in which the general metabolic level is low and marrow function is manifested by anemia with lack of the ordinary recognized signs of red cell regeneration.
   - B. Aplastic states. The term plasia is generally used to indicate the destruction of so much of the marrow that red cells sufficient for the body's needs can no longer be produced. Such marrow destruction can be caused by poisons, physical agents such as X-rays and radium, septic processes, leukemia, Hodgkin's disease, and malignancy.
   - C. Lack of structural material.
3. Excessive red cell destruction. This occurs in severe infections, hemorrhagic diseases, and poisoning.
4. Lack of hemoglobin formation due to lack of iron and other constituents.
5. A combination of two or more of above factors.

Nutritional Anemia

Nutritional anemia is due to lack of some substance in the diet so that hemoglobin formation cannot occur normally. It has long been observed that breast fed infants show a tendency toward anemia unless additional iron is administered. Dewaney[111] following the hemoglobin in breast fed infants found that the hemoglobin at birth averaged 120 per cent, at the end of the second week 96 per cent, second month 76 per cent, sixth month 68 per cent, and twenty-fourth month 65 per cent. In other words, there was a tendency toward low hemoglobin level from the second month up to the end of the second year after which it slowly rose again. Nutritional anemia of short duration responds well to iron and adequate diet, but if of long duration, the re-

sponse is not so good. Parson and Wright[112] showed that chronic anemia causes dilatation and hypertrophy of the heart. Other evidences also indicate hypoplasia of the blood forming organs. If the anemia persists long enough the cardiac and hemopoietic damage may become irreparable.

Anemia in Infection

The association of anemia with infection is a common phenomenon. The mechanism by which anemia results is not entirely clear but it probably is a combination of nutritional factors together with toxic effects upon the hemopoietic apparatus or blood elements.

Infective processes induce marrow hypoplasia which if prolonged lead to marrow decompensation. Marrow recompensation may occur if the contributory factors are eliminated. Meanwhile blood transfusion helps in preventing permanent damage to the heart and hemopoietic system. Our experience has shown that anemia resulting from toxin or infection does not respond well to iron administration.

Sussman[113] showed that with infection there is a progressive fall in the hemoglobin. Repeated small transfusions can maintain the hemoglobin at the normal figure. In acute infections he stated that three beneficial results may be derived from transfusions: (1) Replenishment of hemoglobin and red blood cells, (2) introduction of immune bodies, (3) bone marrow stimulation. Experimentally it can be established that large transfusions in anemia depress bone marrow function. In children, however, transfusion of 10 to 20 cc. of blood per kilo of body weight stimulates bone marrow as evidenced by increased blood regeneration.

Toxicity of Hemoglobin

Ottenberg and Fox[114] showed that 3.45 to 8.25 grams of hemoglobin injected intravenously into 20 normal individuals caused no untoward reactions.

Behavior of Hemoglobin After Transfusion

Sibley and Lundy[115] showed that the average rise in hemoglobin following transfusion of 500 cc. of citrated blood was 1.5 grams of hemoglobin per 100 cc. This rise was manifested about two days following the transfusion, and gradually decreased thereafter, reaching about 1 gram increase in 10 days. In cases in which no reaction occurred, the rise in hemoglobin was 2.12 to 2.18 grams per 100 cc. In cases with a reaction the increase in hemoglobin was approximately 50 per cent less on an average. The lower the value of hemoglobin in the recipient before the transfusion the greater the amount of increase in value for hemoglobin after the transfusion.

Single or Repeated Transfusion

In our experience repeated small transfusions have given better results than one large transfusion in the anemias. It was also observed that early rather than late transfusion gave the maximum benefit. With the hemoglobin less than 30 per cent (Sahli), a large transfusion often causes alarming reactions. In such instances not more than 10 cc. per kilo of blood should be given.

Anemia with Hemorrhage and Blood Dyscrasias

There does not seem to be much argument that transfusion is indicated in these conditions. In an invariably fatal disease, such as leukemia and Hodgkin's, transfusions are not indicated. However, until the diagnosis is unmistakably established, blood should be administered.

"Atrepsia"

In this condition which is not uncommonly encountered in pediatric practice, blood transfusion increases blood flow, blood volume, and protein, with usually marked improvement in the condition of the patient.

"Alimentary Intoxication"

In this condition, vomiting and diarrhea play a prominent role. Dehydration, alkalosis, or acidosis results. Proper administration of electrolytes brings prompt relief in many instances. In other instances, the administration of blood in conjunction with electrolytes may b. necessary.

Indications and Contraindications for Transfusion

As mentioned previously, no uniform set of rules can be given in regard to indications for transfusion. Each physician must use his own judgment. The beneficial effects expected should be weighed with the possible harmful effects which can occur. It is hoped that the preceding discussion may aid the reader in reaching his own conclusion. Contraindications are few in number. Among those mentioned are cardiac decompensation, renal insufficiency, pulmonary edema, and abuse.

Analysis of 1846 Transfusions on 827 Children

No sera or antipyretics were given prior to or within 24 hours after a transfusion. In the citrate transfusion, 15 cc. of 2 per cent sodium citrate was added to every 100 cc. of blood. The procedure was carried out by residents or by internes properly supervised by an experienced resident. The results are summarized in outline form in order to conserve space and for the sake of clearness.

Number of children transfused	827
Number of transfusions	1,846

Age groups:

Newborns up to 2 years	273	cases
2 to 5 years	186	"
5 to 9 years	192	"
9 to 14 years	176	"
Total	827	"

Reactions and complications:

1. Fatality:		
Pulmonary edema	1	
Sinus transfusion	1	
	2	(0.1%)
2. Infection at site of injection	2	

3. Transfusion reaction:

Chills alone	3	
Hyperthermia or chills or both (±2°F)	26	
	29	(1.6%)

Type of blood transfused:

Unmodified blood	168
Citrated blood	1,678
Total	1,846

Routes of transfusion:

Intraperitoneal	6	
Intravenous	1,807	
Sagittal sinus	33	
Total	1,846	(1 death = 3%)

Apparatus used in order of frequency at different age periods:

0 to 2 years:	2 to 5 years:	5 to 9 years:	9 to 14 years:
Unger	Unger	Gravity	Gravity
Lindeman	Gravity	Unger	Unger
Dissection:	Lindeman	Lindeman	Lindeman
1. Unger			Scannell
2. Gravity			

Veins used in order of frequency at different age periods:

0 to 2 years:	2 to 5 years:	5 to 9 years:
External jugular	Antecubital	Antecubital
Scalp	External jugular	External jugular
Internal malleolus	Scalp	Foot or hand
Foot and hand	Internal malleolus	Scalp
Antecubital	Foot and hand	9 to 14 years:
Sinus	Femoral	Antecubital
Femoral		Internal malleolus.

Indications at time of transfusion:

In the criteria for calling a case an anemia we have set the arbitrary level of 60 per cent (Sahli) as the lower limit of normal. The normal hemoglobin of healthy children in Minneapolis was found to be about 85 per cent (Sahli) in going over the records of 500 children.

Primary anemia	17
Secondary anemia	185
Hemolytic anemia	32
Nutritional anemia	47
Hemorrhage	42
Blood dyscrasias	18
Acute contagious diseases	169
Acute non-contagious diseases	128
Chronic infections	68
Preoperative	66
Postoperative	95
Malnutrition	78
Intoxication	37
Shock	30
Sepsis	52
Diarrhea, vomiting	110
Nephrosis	5
Total	1,179

Under intoxication is listed:

Burns	21
Poisoning	8
Uremia	8

Association of anemia with infections:

1. Acute contagious diseases:
   Anemia present in 51 (30 per cent).
2. Acute non-contagious diseases:
   Anemia present in 42 (33 per cent).
3. Chronic infections:
   Anemia present in 48 (56 per cent).

Comparison of Effect of Iron and Transfusion in Elevating Hemoglobin

Ten cases of nutritional anemia were treated by iron or iron and copper in conjunction with what is ordinarily considered to be an adequate diet. The hemoglobin ranged from 30 to 50 per cent. The average time it took for the hemoglobin to rise to normal (85 per cent or above) was 32 days.

There is a controversy at present as to whether transfusions are indicated in nutritional anemia. The exact mechanism in nutritional anemia is not entirely clear. That iron alone is very seldom the chief factor is attested by failure to respond to iron in several instances. Anemia predisposes to infections. At least in our 47 cases, the majority gave a history of repeated acute upper respiratory infections. Infections definitely lower hemoglobin due either to toxic effect upon the bone marrow or direct action of the blood elements. Stimulation to hemopoiesis requires an adequate oxygen carrying capacity of the red cells. With anemia, the oxygen carrying capacity is reduced, and therefore, hemopoiesis is diminished. Thus a vicious cycle is established, anemia leading to susceptibility to infections, and infections predisposing to anemia. The child appears pale, lacks appetite, and thus the administration of an adequate diet is difficult even in the hands of an experienced nurse. Transfusion or a series of transfusions brings about a rapid rise of hemoglobin to normal level, normal color to cheeks, brightness and normal activity, and return of appetite. Much time and money is saved by this simple procedure and often prevents repeated hospitalization of these children with respiratory infections.

Behavior of Hemoglobin Following Transfusion in the Anemias

1. *Rise of hemoglobin in primary anemia*: 17 cases. The hemoglobin level was followed after transfusions of 20 cc. citrated blood per kilo of body weight, and was found to have risen 15 per cent at the end of three days. On the whole as the hemoglobin rose, the degree of rise became less so that when 80 per cent was reached the rise was only 5 per cent.
2. *Rise of hemoglobin in nutritional anemia.* Following a transfusion of 20 cc. per kilo, there was a prompt rise, the degree of rise depending upon the level of hemoglobin prior to transfusion. The maximum rise of hemoglobin occurred in three days. At the end of seven days, it was approximately 60 per cent of the rise at the end of three days. The behavior of the hemoglobin post-hemorrhage was similar provided that hemorrhage did not persist. The above findings are summarized thus:

Hemoglobin prior to transfusion 20% (Sahli)	Rise of 30%
Hemoglobin prior to transfusion 30% (Sahli)	Rise of 28%
Hemoglobin prior to transfusion 40% (Sahli)	Rise of 25%
Hemoglobin prior to transfusion 50% (Sahli)	Rise of 20%

Hemoglobin prior to transfusion 60% (Sahli)
Rise of 15%
Hemoglobin prior to transfusion 70% (Sahli)
Rise of 7%
Hemoglobin prior to transfusion 80% (Sahli)
Rise of 5%

3. *Rise of hemoglobin in anemia associated with acute infections.* No constant curve for rise in hemoglobin was obtained in 131 cases. The degree of rise depended upon the severity of the infection, the level of hemoglobin prior to transfusion, and on whether a hemolytic factor was associated. With active infection, daily transfusion can generally raise the hemoglobin to normal level provided that hemolysis did not occur. However, it was seldom that the hemoglobin could be elevated above 80 per cent in the presence of an acute active infection, in spite of daily transfusions. The maximum rise in hemoglobin occurred 12 hours following a transfusion, this was maintained for 2 days, after which the hemoglobin tended to drop again rapidly so that the original level was obtained at the end of 4 days. Therefore, in the presence of an acute infection, transfusion at least every 4 days is necessary to maintain the hemoglobin level.
4. *Rise of hemoglobin with or without reaction.* Chills or fever or both had no effect on hemoglobin rise, provided no hemolysis occurs. With hemolysis, the rise was not dependable. In sickle cell anemia and hemolytic anemias of the newborn, there often occurred a fall in hemoglobin although blood was compatible on ordinary matching.

Transfusion in Lobar Pneumonia

Berkley[100] stated that anemia or lack of blood volume is rarely a problem in pneumonia and that transfusion in pneumonia is rarely if ever good therapy and often is most harmful. Eleven deaths out of twenty-four occurred as a result of acute heart failure. Nine of these eleven were due to "speed shock." He summarized by stating that "transfusion in pneumonia may be and often is worse than useless." Our results as well as the reports of others[116] do not agree with the statement of this author.

We have analyzed 74 cases of lobar pneumonia who were transfused during the acute febrile stage, and the results are tabulated in outline form. No deaths occurred with these transfusions, nor were evidences of speed shock or cardiac failures noted in these cases.

	Temp. Drop by Crisis	No Crisis
Lobar pneumonia with anemia	17	11
Lobar pneumonia without anemia	22	24
Total	39 (53%)	35 (47%)

Incidence of anemia in lobar pneumonia—28 (38%).

Analysis of Transfusion in Acute Contagious Diseases

	Crisis	No Crisis
Scarlet fever	12	34
Pertussis	9	17
Measles	16	39
Chickenpox	6	6
Erysipelas	2	7
Mumps	2	3
Poliomyelitis	0	95

In these cases, as far as possible, donors were utilized who gave a history of having had the disease in childhood. Cases transfused with convalescent blood are not included in this series except that for poliomyelitis. In many instances, it was noted that one transfusion brought marked improvement with immediate drop in temperature, followed by a rise again. In these cases, repeated transfusion kept the temperature down. In other instances, although the temperature did not drop, the patient appeared clinically much better than prior to transfusion.

Summary

1. Modern blood transfusion is a comparatively safe procedure. Practically all fatalities today can be attributed to carelessness or failure to utilize the knowledge we now possess as regards blood transfer.

2. The citrate method has been found to be the safest and most practical for children.

3. The route and method employed are governed by two principles: (*a*) that a maximum of safety and benefit be conferred to the patient, (*b*) that a minimum of disturbance be created in the patient by the procedure. When judged by such principles, sinus and intraperitoneal administration of blood is not practical for routine use.

4. The indications for transfusion are not always clearcut. The ultimate guide rests with the beneficial results which one wishes to confer to the patient.

5. The dosage of blood which can be safely transfused at one time depends upon the weight and condition of the patient. In acute hemorrhage, an amount equal or greater than the volume lost may often be offered. In most instances, the average dose is 20 cc. per kilo of body weight. In long standing cases of anemia, not more than 10 cc. per kilo should be administered at one time; larger doses may precipitate a severe reaction or cardiac embarrassment.

6. Preserved blood has its indication in hemorrhage or emergencies; otherwise, fresh blood has given better results and less reactions.

7. Iron deficiency or nutritional anemia is difficult to separate from anemia which results from repeated upper respiratory infections. In these cases it is often found that iron and diet are ineffective, whereas blood transfusion gives a prompt beneficial response.

8. The incidence of anemia in infections is high, contrary to popular opinion. In this type of anemia, repeated small transfusions are more effective than a single massive transfusion. In severe acute infections, to maintain the hemoglobin level, blood must be administered at least every four days during the active stage of the disease.

9. Early transfusion gives the maximum benefit under any circumstances; blood administered during the terminal stages of a disease does little good and may precipitate death.

10. Analysis of our cases reveals that a plea for less transfusion voiced by many should be supplanted by a plea for careful, early, and repeated transfusions in patients with proper indications.

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Summary of a Ten-Year Tuberculosis Control Program*

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THE decrease in the incidence of tuberculin reactors, using 1:1000 of Koch's O.T., in both rural and town schools in the Riverside Sanatorium district, has been rather striking as observed over the period of the last ten years. The counties comprising the Riverside Sanatorium district are Yellow Medicine, Renville, Chippewa, and Lac qui Parle, located in the south central, western portion of Minnesota.

The rural and town school surveys were commenced in 1930, and have been continued periodically. The same technique and the same strain of Saranac Lake Old Tuberculin has been used. A total of 10,907 school children have been tested over this period of ten years, repeating the tests in the same communities, from the same homes, and under the same conditions each time. Only the total is given of those schools which we have re-checked several times during this period of observation.

In the total of 10,907 children tested in ten years, 987 or 9 per cent were found to react to tuberculin (1:1000) over the whole period of time. The schools listed below show the indicated drop in percentage of reactors, and the first and last year in which they have been tested.

The above schools were picked from 198 school tests done in our district to show the greatest interval of time for accurate comparison. The total decrease in percentage in all schools tested is shown by the following comparison:

Percentage Reactors, first test 14.1
Percentage Reactors, last test 6.75

School	Year Tested	Pct. Reactors to 1:1000 Koch's O. T.	Number Tested
Wood Lake	1930	8.6	149
	1940	5.7	181
Montevideo	1934	13.6	784
	1940	7.4	791
Renville	1934	7.4	424
	1940	4.3	472
Yellow Medicine Rural, 66 schools	1935	8.2	1019
	1940	1.9	967
Rosen	1937	8.8	90
	1940	2.5	86
Echo	1931	10.8	111
	1937	3.7	132
	1940	2.1	190
Granite Falls	1931	9.33	428
	1940	6.7	553
Hanley Falls	1932	11.7	94
	1940	.7	131
Marietta	1931	17.9	129
	1937	12.5	184
	1940	7.5	153
Bellingham	1935	7.5	147
	1940	4.7	167
Clarkfield	1933	9.6	307
	1940	3.07	423

We attribute this drop in the percentage of reactors to the following factors:

I. Educational
   A. Talks to schools, Parent-Teacher organizations, Farm Bureau groups, and civic bodies.
   B. Demonstrations and literature to both parents and pupils in every school.

II. Follow-up Field Nurse Service
   A. X-ray of all reactors.
   B. Careful investigation of home conditions and X-ray of any suspects or other contacts.
   C. A careful history of any possible contacts that may have been broken previous to our entry into the field.

III. Follow-up of all reactors in from three months to a year with a second X-ray.

IV. Breaking any contacts with a known case of pulmonary tuberculosis by admitting open case to the Sanatorium, whenever possible, where control can be instituted. If not possible, to place any children or young adults in another home away from possible contact with the open case.

V. Stressing the importance of the cattle testing program, and seeing that it is religiously followed through.

As has been shown, our rural schools in five years have dropped from 8.2 per cent reactors to 1.9 per cent. This is for the whole group of 66 schools in which 1,686 children were tested. In our largest city school the percentage has dropped in six years from 13.6 per cent to 7.4 per cent. The difference in the drop in percentage may be attributed to the fact that in the cities, it is harder to isolate contacts than it is in rural districts, as the average child's sphere of possibility, insofar as infection is concerned, is manyfold greater in cities or towns than those who live in the country and attend rural schools.

In our 1939-1940 testing program, readings were made at 48-, 72-, and 96-hour intervals. It was found that the 72- and 96-hour readings were identical in every instance, and that there was a 20.43 per cent increase in reactors from the initial 48-hour reading. It would seem from this, that the ideal time to read Mantoux tests would be between 72 and 96 hours after the test was made. In this way we get more accurate readings on the so-called delayed reactors which have been a source of annoyance to all of us from time to time.

Special emphasis has been given throughout this period of time, in testing and X-raying teachers, janitors, and employees of schools, who are occasionally found to be another source of infection.

We feel that a continuance of this type of work is meritorious, and that by continual repetition over a period of years, tuberculosis, in communities where transients are not a problem, can be reduced to a minimum.

*Presented before the medical staff of the Lymanhurst Health Center, Minneapolis, October 22, 1940

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Spontaneous and Surgical Covering of Raw Surfaces*

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In this paper an attempt is made to present a general review of the problem of caring for denuded body surfaces.

Partial Thickness Loss of Skin

Raw surfaces result most commonly from burns, following which large areas often repair themselves quickly with early restoration of function and absence of deformity. This means that the full thickness of the skin has not been lost and that healing resulted by regeneration of skin from the deep glands of the derma, much the same as occurs in the donor site of a thick split graft (fig. 1). This point of rapid healing in superficial burns is of importance in evaluating various types of treatment of burns. Exaggerated claims for the ability of a certain method to insure complete healing without scarring results often from a failure to appreciate how healing occurs, and in such wounds all treatments which do not actually produce further loss of tissue and which are equally free from accompanying infection produce equal results.

Full Thickness Loss of Skin

If the full thickness of the skin is lost, the result is an open wound and regardless of the type of treatment employed, healing is by scar, and additional deformity results in proportion as the loss exceeds the normal excess of skin in the area. Thus the size of these defects is relative for various parts of the body; a loss of the eyelid or the back of the hand of only a few centimeters may be as crippling as a very large loss over the flank or thighs.

Spontaneous-Healing Tendencies

In the consideration of the healing tendencies of large areas, it is recognized that there are marked individual, and often not understood, variations in the rate of epithelization of these wounds. An occasional patient may present healing of a large full thickness loss without deformity (fig. 2a) or may grow epithelium that is of great benefit or may be even life-saving. This is not the general rule, and the patient lapses into one of the following classifications:

1. The large wound may show extreme epithelial activity in the form of piling up of keratin at the margin without progress (fig. 2b and 2c), or with hopelessly slow extension of the healing edge across the open wound.

2. There may be no epithelial response whatever to the wound stimulus, and, with the continual loss of body fluid and debilitation, death may occur (fig. 2d.)

3. The area may heal completely at rest only to repeatedly break down on insignificant trauma or activity of the patient. The constant wound stimulus of tension and inflammation sometimes causes excessive keratin formation. It is this type of wound which may progress to malignancy, although rarely and at a late date.

4. If even small deep wounds are allowed to remain in a dirty condition, and if pain is permitted to go uncontrolled, debilitation and death may occur.

Pain and Contractures — Healing of Non-Epithelial Nature

In addition to the factor of surface epithelization, the granulating wound and underlying and adjacent functioning part must be considered. In wounds long open, pain on manipulation may become most severe, due, presumably, to nerve endings developing in the bed. As the morale of the patient becomes exhausted, proper wound care becomes increasingly difficult. This cycle is one of the underlying causes of death in old unhealed burns (fig. 2d).

The area of the wound is diminished, in addition to healing by surface epithelization, by the wound pulling in toward the center. This is termed primary contracture. If the original loss does not largely exceed the normal surplus of lax tissue in the region, this may progress without severe disability, but widespread losses will produce marked displacement and deformity of the surrounding surface, tendons and joints (fig. 15).

Secondary contractures may be considered those that occur in underlying tendons, which, though not damaged directly, have been held contracted so long, both voluntarily and by overlying scar, that they are actually shortened (fig. 3).

Scar Epithelial Healing

The thin scar epithelial healing that is so important in saving life and in turning painful, dirty raw surfaces into clean healed areas, is many times not of sufficient strength to give the permanent surface necessary for the area. This epithelium is dry, being devoid of hair and sebaceous glands, may form excessive keratoses, is subject to cracks and irritation and may break down over large areas on slight trauma and circulatory disturbances.

The reason for this unsatisfactory healing may be clearly shown microscopically. The scar lies on an avascular fibrous base, oftentimes of excessive thickness. This epithelium differs from that which regenerated from deeper skin structures in the part thickness skin loss, in that it has no supporting derma to attach it to

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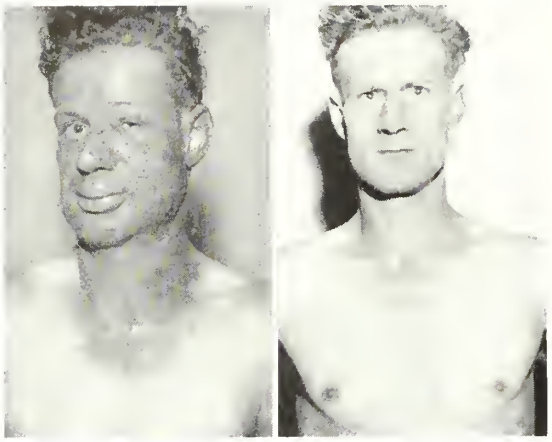


A B

Fig. 1. (A) Patient with widespread burn of face (and arm); in hospital eleven days with open surgical drainage, including soap and water cleansing, gentle debridement and fine-mesh grease gauze over the entire area. (B) Completely healed without deformity because there had been no full-thickness loss of the skin.

its base. There are no papillae present; it may be but a few layers of cells thick in one place and close by show marked hyperkeratosis (fig. 4).

In some patients who present healing after widespread burns, there may be no actual deformity but a general tightness of an area with perhaps some limitation of motion of an extremity. These patients frequently need more skin surface and a release of the general surface tension is effected by a simple opening across the tightest portion of the contracted area, which allows the areas to retract, and then the insertion of split grafts into the open area. This condition may be called a "general skin shortening" and in some cases there seems to be a sort of bursa formation under the heavy scar surface. (fig. 5).

Objects of Treatment

General. The general care is of utmost importance and includes the exercise of gentleness, patience and interest in the patient's welfare by all who come in contact with him. All manipulative procedures should be so planned as to not only be attended by the minimum pain but to assure the patient that he will never be subjected to unnecessary pain. Restraints should never be used. Traction to attempt to prevent the natural primary contraction of a part is ineffectual. Sedatives should be used carefully. An interest in the surroundings should be developed, especially when the patients are children. The maintenance of nutrition is of extreme importance and transfusions may be required frequently.[5]

Local. The local care of the open wounds has for its object the cleaning up of the areas as quickly as possible, so that not only may spontaneous healing proceed at the maximum rate, but that the lost surface may be restored with skin grafts before damaging contractures have occurred and before debilitation and pain have developed beyond control. Surgical drainage is best accomplished by the use of saline dressings or by the saline bath for from one to three hours a day followed by dry heat or further wet dressings. Many antiseptics, common and proprietary, and Gentian violet may be used, but Dakin's solution is usually relied upon if anything other than saline solution is thought necessary.[5] (fig. 6).

A firm pressure dressing that is kept moist by irrigation, combined with elevation, may be of great advantage for lesions of the extremities; marked improvement may be noted within forty-eight hours.[5]

Pain should be kept down to a minimum when the dressings are removed. They may be soaked off gradually in a bath. It is important that some protector is used next to the wound to prevent the granulations from growing up through the meshes. For this, old linen, perforated cellophane-like material, or very fine mesh gauze is usually satisfactory, so that dressings can be removed even from children with a minimum of discomfort. When cellulitis is controlled, grease dressings (xeroform 4 per cent, zinc oxide 5 per cent, or scarlet red 5 per cent)* on fine gauze or linen can be used; these allow the patient greater freedom, but they are not to be used for several days immediately preceding operation. Gentle mechanical cleansing of wounds daily with soap and water is important, but care should be taken not to disturb epithelization.[5]

Surgical drainage and pressure dressings usually produce bright red, firm granulations in the wounds, free from surrounding cellulitis. Bacteriological studies have shown that it is probably easier to get sterile cultures from small wounds than from very large open areas. A thorough Carrel-Dakin technique is an advantage, but careful evaluation of the general condition and of the gross appearance of the granulations and surrounding tissues usually suffices for the determination of the time for operation. Bacillus pyocyaneus is one of the worst organisms to contend with in skin grafting, but soap and water frequently followed by 5 per cent gentian violet or a mercurial dye antiseptic seem to give fair results.[5]

Another important result from the use of the saline bath is that ordinary secondary contractures will have been straightened out by the voluntary effort of the patient without the use of traction or restraints. Most patients are extremely grateful for the bath and realize their first comfort in it, and it has occasionally been a life-saving measure. There may be a bad reaction to it, however, and there is frequently an elevation of temperature. If any of these bad effects are too severe, the bath may be omitted at least temporarily.[5]

When out of the bath, patients can be kept comfortably warm in a covered bed with or without dressings. This allows the patient free movement and makes the nursing care somewhat easier (fig. 6).

Types of Free Skin Grafts for Making Repairs

A consideration of the histology and thickness of the skin is of some importance in relation to the various types of free grafts.

The *Riverdin or pinch graft* includes a shallow thickness just through the epithelium and has a surface area of 0.5 sq. cm. or less. It happens to be the least useful of all the types of skin grafts, and one usually finds

*There are so many ointments for use on wounds in current use that they all cannot be included here (cod-liver oil, paraffin, sulphydryl-containing compounds, allantoin, mercurials.)

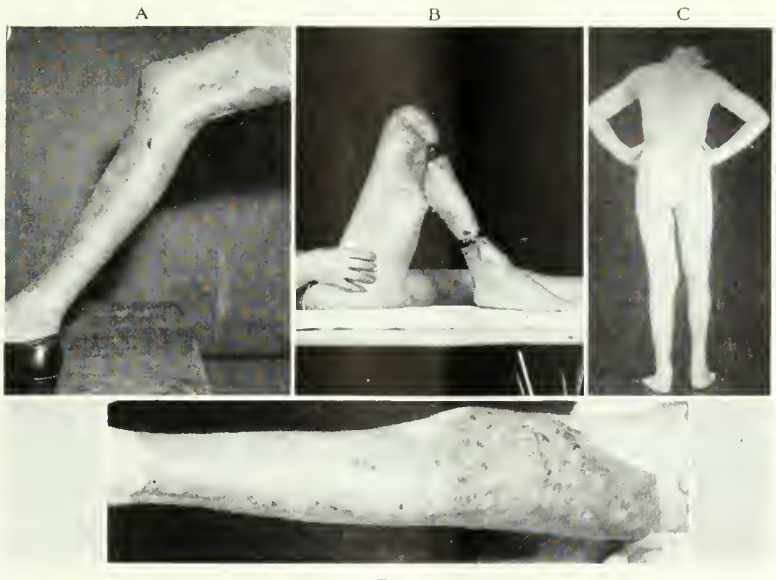


Fig. 2. (A) Result of spontaneous healing in seven weeks of a large full-thickness loss with the use of alternate saline soaks and fine-mesh grease gauze dressings. This represents the occasional patient who heals rapidly and firmly. Repeated ulceration may still occur and require grafting. (B) Keratotic edge of a large loss that has not healed in 1½ years and probably never would heal spontaneously. (C) Same leg as in (B) healed in one opening operation and two split-graft operations. One split graft, taken from the former donor site of small deep grafts, can be seen in the popliteal space. (D) Total failure of epithelization and formation of granulations when first seen three months after a burn. Pain and general debilitation and failure of response of the wounds to the usual active measures employed resulted in death after two weeks. Patient might have been saved if early successful grafting could have been done.

that thicker or deeper sections of the skin give much better results. This thicker graft has been reported on extensively by Davis, who has suggested the term "small, deep graft." It will grow in many fields where others will not, but oftentimes, because of this fact, little attention is paid to the preoperative preparation of the wound, with the result that many of these grafts are lost. They are most valuable for areas that are covered by clothing, as they give a rather spotty appearance; they are also of service at times for hastening healing in areas that cannot be made clean enough for other methods of grafting, or where other methods have failed. Not the least advantage of this particular type of graft is that the operation can be performed simply under local anesthesia (fig. 7).

Where pinch grafts are used as a partial or preliminary repair, one should keep in mind that a carelessly chosen donor site may later interfere with the taking of much needed split or full thickness grafts. It is a good rule never to choose a donor site for pinch grafts where a large repair is needed from whence split or full thickness grafts may be taken; the broad, flat surfaces of the body should be avoided.

Ollier-Thiersch grafts are usually thought to contain only the epidermis, but they are cut in sheets of skin in contrast to the small bits taken as pinch grafts. In reality, even the thinnest Ollier-Thiersch graft usually includes a thin layer of derma. These grafts are too thin to be of much use in making large repairs where there must be a firm surface.

Thick split-grafts. After one has tried to use the thin Ollier-Thiersch graft, he will almost automatically cut deeper. A graft of from one-half to three-fourths of the thickness of the whole skin is perhaps the most useful in making all repairs of raw surfaces. This graft could be designated as a "thick Ollier-Thiersch" or as a "thick split-graft." (fig. 8).

The term "split" graft was coined to designate any graft of partial thickness obtained by splitting the skin in two, the idea coming from the operation of a leather splitting machine in a harness shop.

Where large areas are to be covered, it is necessary to obtain large pieces of these grafts without cutting entirely through the derma so that healing of the donor site can occur rapidly from the epithelial glands that are left behind in the lower layers of the derma. Rapid healing of the donor area is most important as it makes large amounts available at one time. One hundred square inches are frequently taken, and as high as 180 square inches have been transferred in one operation.

The deep glands in the derma "de-differentiate" into squamous epithelium and cover the surface in from six to eight days; and in from twelve to twenty days no dressing is necessary. This de-differentiation can be shown clearly in microscopic sections, and, if healing is uninterrupted by infection, successive "crops" of skin can be cut from the same area, as high as four crops having been taken from one area. There is a marked variation in patients in the regeneration of the surface; it is usually several weeks before a second graft can be taken, but such a graft has been obtained as early as

A B C

Fig. 3 (A) Very large full-thickness loss with secondary contracture. (B) Complete healing in two split-graft operations and prevention of growth of arm to side, after five months. (C) Complete function and permanence of original repair shown $1\frac{1}{2}$ years later.

nineteen days after the previous "crop" (fig. 9).

The donor sites are dressed carefully with greased fine mesh gauze and the dressing is allowed to remain from ten to fourteen days. Silver foil or tannic acid may also be used. Healing occurs most promptly when there is little or no activity.

The cutting and application of split grafts. The most essential equipment is a very sharp, long knife of the amputation variety. With this long knife, large grafts may be cut rapidly, and the larger they are the more easily they may be applied; grafts up to 18 by 5 inches may be obtained from suitable thighs. With the suction

A

B

Fig. 4 (A) Scar epithelium, the result of spontaneous healing. Typical scar base, thin flat epithelium without hair, glands, or papillae with a heavy keratin layer, indicating marked cellular activity, presumably the result of the continued wound stimulus of the open area and the surrounding tension. Red blood cells, the result of trauma, can be seen just under the epithelium ready to lift it entirely off of its scar tissue bed, as is shown completed in the next figure. (B) The "scar" epithelium has been completely detached from its underlying scar base which is a step farther along in the unstableness of scar epithelium than the preceding figure. This is an actual traumatic denudation and not an artifact produced in the laboratory. Normal epithelium cannot be stripped up in this manner.

Fig. 5. Generalized skin shortening throughout the trunk and axilla, relieved by one operation on the axilla and one simple one across the hip by opening the scar between the arrows, allowing the edges to retract, and then covering the open area immediately with thick split grafts as outlined. Fresh donor sites visible on thighs.[5]

retractor, described in 1929,[1,5] or by elevation of the skin with large tenacula, fairly large grafts may be cut even from the abdomen. Several other methods of producing a diaphragm of the skin for cutting split grafts have been described, the most recent one by Padgett, who produces the diaphragm by elevating a metal drum to which the skin has been glued.

These grafts are applied to the area after granulations have been carefully and smoothly shaved off, after any healed contractures have been fully opened by dissection, or after scar tissue has been excised. They are held firmly in place with running horsehair or 000-silk sutures all around and multiple mattressing sutures over the surface. Many stab holes are made through the grafts to provide for drainage. It is important to note that the removal of granulations causes a good deal of bleeding and that over large areas it must be done very carefully, or even omitted if the patient cannot stand the added bleeding (fig. 10).

For very flat surfaces, such as legs and thighs, if the granulations are very firm, the grafts may be spread out over them and then "snubbed" in place with a sterile fine mesh roller bandage that has been wet in saline solution. The rolls of the bandage should press the graft out firmly without wrinkling and be secured with many turns so that no displacement can occur.

If the wound has been quite dirty originally and refractory to treatment before operation, or if there are any reasons to fear a degree of infection that might damage the graft, a wet saline dressing with irrigation tubes incorporated in it is applied and pressure is obtained over the area with sea sponges bound on firmly with heavy gauze rolls. The dressings are constantly kept moist for from three to four days after which time the first dressing is changed.

If the area is small and quite free from contamination, a sponge pressure dressing is applied with a few layers of grease gauze over the graft instead of the wet dressing.

On flat surfaces the bandage may be made so smooth and firm that no sponges are necessary.

Extreme care should be taken with the dressings which are done first on the third or fourth day; the graft

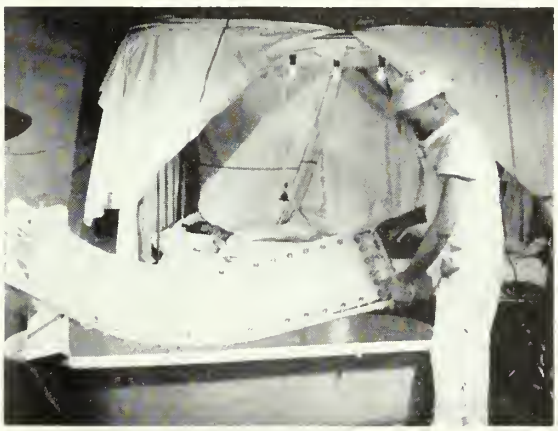


Fig. 6. Simple equipment for saline bath of a portable tub and a bent Bradford frame. The bed is covered for warmth; irrigations can be maintained here if desired. Patient being cared for by Robert Smith, assistant resident surgeon at Barnes Hospital.

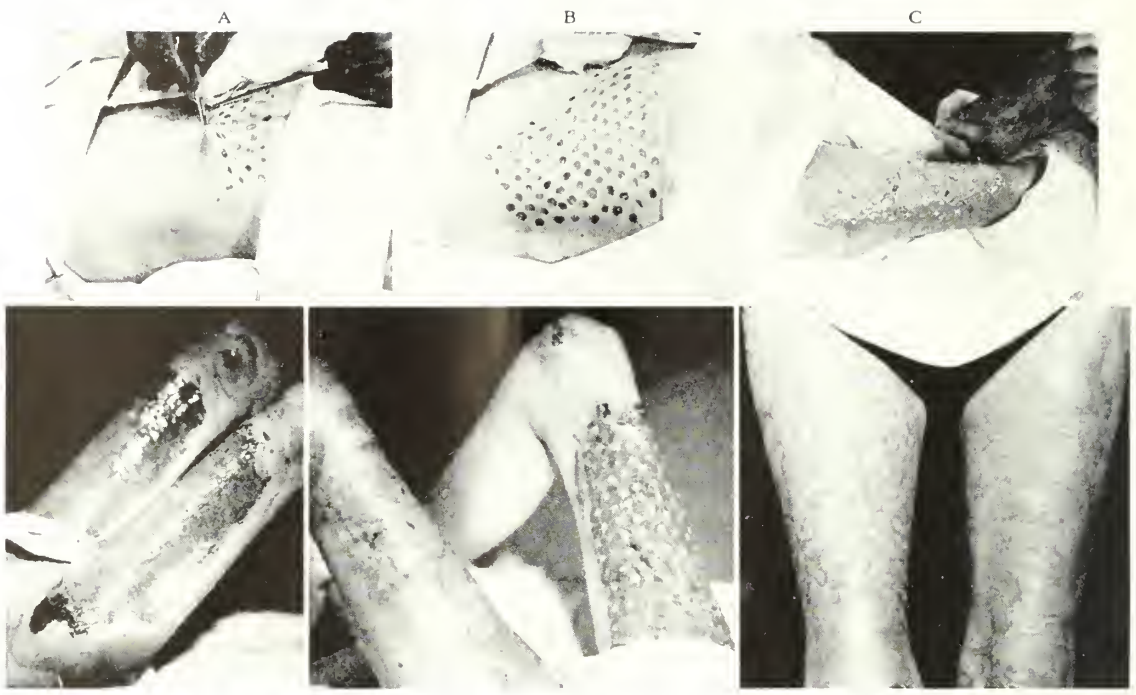


Fig. 7. Small Deep Grafts (same technique for Reverdin grafts). (A) Straight needle on a clamp lifting a cone of skin which is cut off and left on the needle for transferring to the raw area. (B) Donor site. (C) Grafts firmly in place and the beginning of a very careful dressing with fine-mesh xeroform or scarlet-red gauze ready to "snub" the grafts in place. This is covered with pads and tightly bound gauze rolls. A continual wet dressing may be used if indicated. (D) Very clean areas of full-thickness loss, practically same extent on both legs. (E) Six days after the pinch-graft operation (under local anesthesia) with all grafts viable. The opposite leg in the meanwhile has been covered with thick split grafts. (F) Final result seven months later. The roughness of the right leg does not matter much since it is covered. The final bearing support of this leg is about five months behind the left leg.

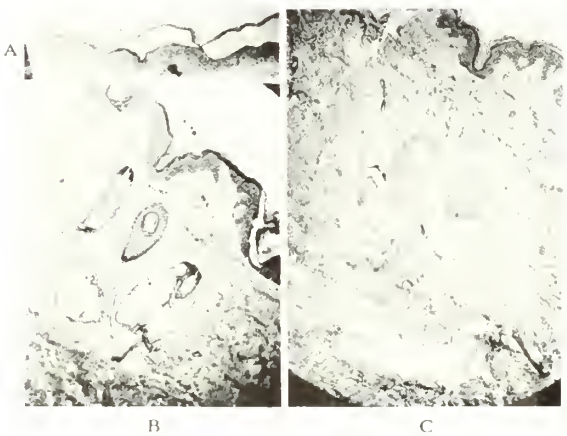
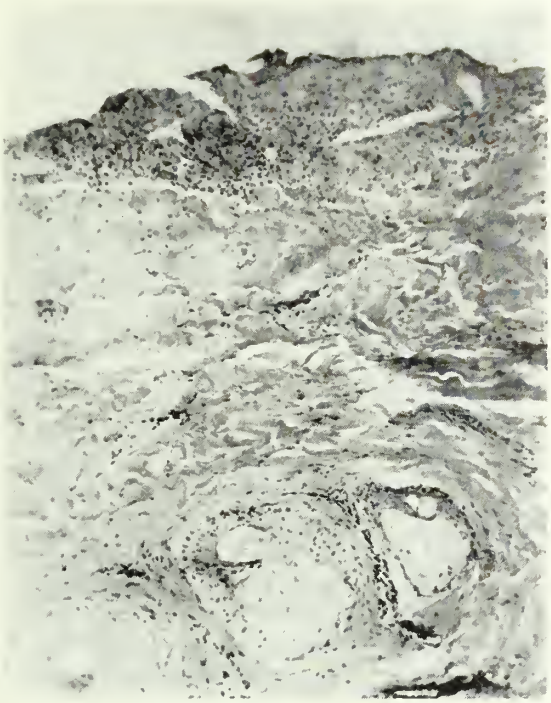


Fig. 8. Thickness of Skin Grafts. All three grafts cut from the same area from a single patient and photographed under the same magnification. (A) Average Ollier-Thiersch thickness. Most texts state that the skin is taken through the papillary layer, but even the thinnest ones usually include some derma. (B) A thick split or thick Ollier-Thiersch graft. The thickness shown here is greater than generally used. It can be roughly graduated between one-third and three-fourths of the full thickness. (C) Full-thickness graft, not quite all of which is gotten in the field of magnification.

edges are trimmed away, sutures are removed, and some mild antiseptic is painted over the area. If there is not much cellulitis, a fine-mesh, grease (xeroform or scarlet red) gauze dressing can be used, but, if infection is present, another wet dressing should be applied.

Late course of split grafts. Operations may have to be repeated to let in more skin or to relieve later contracture. There is usually a stage of wrinkling and often of sebaceous collection in the graft. Active movement of the parts best tends to withstand the underlying contracture, and, for this reason, this type of graft is especially suited to repairs in such powerful areas as the axilla, thigh, and popliteal regions. The sebaceous collections can be emptied out as they occur, and after from six to twelve months many of these grafts appear as the natural skin of the area. Of course, when they are put on uneven surfaces, this roughness will persist (fig. 12).

Full-thickness grafts are not put over large raw surfaces because the size required is prohibitive and the take of a full-thickness dissected graft is not as certain in contaminated fields as that of the split graft. This graft has been used extensively in this series, but it was used in healed deformities in which it was believed that a clean operation could be done (fig. 15). Douglas described a "sieve graft" for the covering of leg ulcers in which the full thickness of the skin was used except that holes were punched through it before it was raised to provide islands of epithelium in the donor area and to allow better drainage through the graft. Other methods of cutting the full thickness graft have been described; one of them has been to take a full-thickness graft, then cut relaxation incisions in it to allow stretching and, therefore, more coverage and also better drainage from beneath.

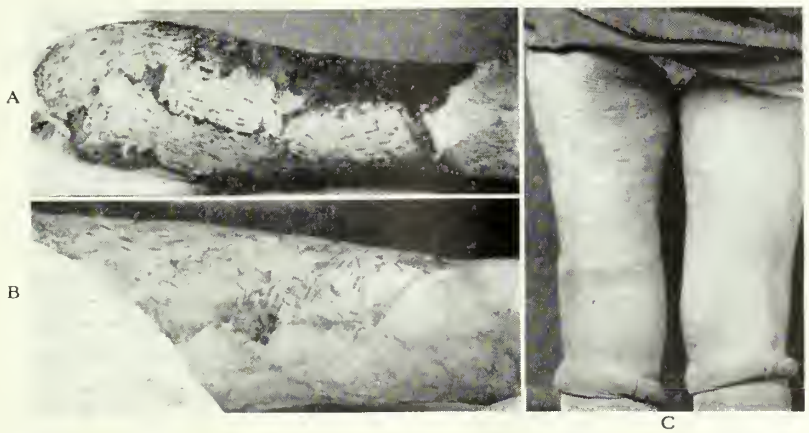


A

B

There is complete surface coverage with squamous epithelium that has "de-differentiated" from the deep glandular epithelium. The connection from the deep gland to the surface can be seen in one area.

Fig. 9. Healing of Donor Sites. (A) Biopsy from donor site of split graft after two days, showing deep glands and uncovered surface. (B) Biopsy from patient five days later.



A

B

C

Fig. 10. Homografts. Delayed Grafts. Sutures for grafts. Healed donor site. Restoration of complete circular loss of thighs. (A) Full take of fresh homografts from mother shown four days postoperatively. These gave good local and general improvement but were completely absorbed in 2½ weeks.[8] (B) Full take of fresh autografts after four days, showing stab holes and suture fixation. Also shows small experimental homograft that has a partial take; it had been stored in an icebox for six weeks. It was completely gone in ten days. (C) Final result showing part of area that was covered, and also well healed donor site on opposite leg.

Other types of grafts are "implantation grafts," which are pinch grafts that have been implanted deep in the granulations, and "tunnel grafts," in which small strips have been threaded through under the surface of a healed scar.

Homografts and delayed grafts. By using autogenous split grafts wherever possible, the donor areas are preserved fairly well, and one is able to find skin enough to make acceptable repairs in most patients.

Fresh homografts are employed only when it is thought that the patient cannot stand a long operative procedure and when there is no sign of spontaneous epithelization. Homografts will usually take satisfactorily, but are absorbed in a few weeks. However, the

Fig. 11. (A) Ulcer of six years' duration. (B) Deep excision has been done including a large area of surrounding "scar" epithelium. (C) Healed in one operation with a single large thick split graft. This procedure is used frequently on scars of old osteomyelitis.

few days' respite that the patient receives while these grafts are in place may actually be a turning point in his recovery and there may be an increased spontaneous epithelization (fig. 10).

It is hoped that some method of getting homografts to persist may be developed; this is one of the most important things that could be accomplished in reconstructive surgery.

It is possible to use successfully autografts that have been stored for several days, but this fact is not very important clinically, especially with regard to split grafts, for the latter can be cut rapidly and add but little time to the operation.[5,8]

Pedicle flaps. Heavier restoration than free skin grafts is occasionally necessary, and direct or delayed pedicle flaps are then used. These flaps are most frequently necessary on the hands and feet following very deep losses.

Fig. 13. Face and Neck Burns. (A) Marked deformity and failure of healing after several months with extreme pain about the open areas. (B) First repair was made with split grafts over the painful open areas to obtain complete healing and freedom from discomfort. Subsequent releases of lid, lips and neck, also done with free split grafts.

Considerations of Certain Regions and Lesions

Grafting open areas first and at another operation releasing deformity and completing the grafting. In repair of areas that are of long standing and complicated by primary and secondary contractions, it is often safest simply to graft the open areas first without opening the contractures. This is to obtain healing, even in a deformed position, so that the surface can be clean enough later to permit a deeper opening into the contracted area, without fear of the spread of infection and the entire correction of any deformity. At this time the new clean raw areas may be covered completely with grafts. If any dirty sinus tracts exist, they should be opened widely as a preliminary step so that they can be cleaned the same as any other raw area (fig. 13).

Axillae, chest, body, popliteal areas, and leg. All of these areas with large open surfaces may be cleaned practically the same way and covered satisfactorily and permanently with thick split grafts in relatively few operations. It is recognized that this is at variance with some authors who state that full-thickness grafts or even pedicle flaps are necessary for repairs of the axilla and popliteal areas. Bad contractures in these areas may

Fig. 12. Restoration of a large, extremely painful loss with a single split graft which was sewed on carefully. The dressing was kept wet by the application of saline irrigations for four days. The final result is practically normal skin (except for hair) that can be used in the reconstruction of the ear.

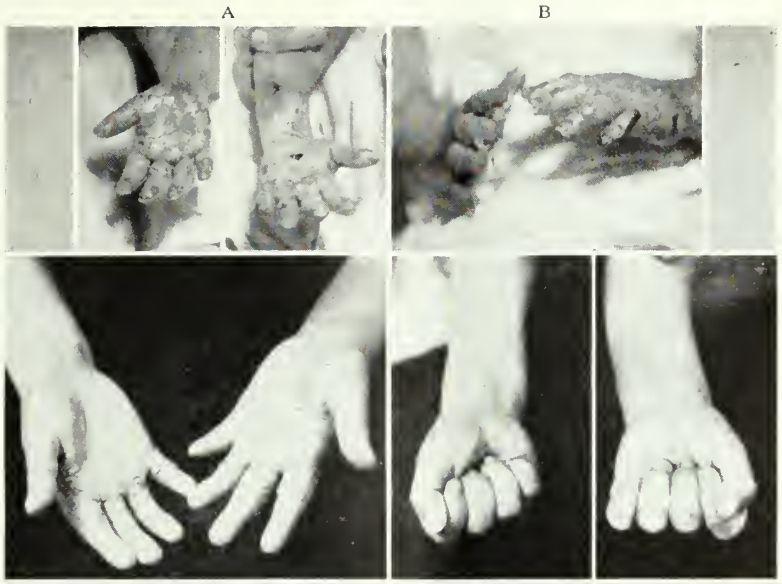


Fig. 14. Fresh Burn of Hand. (A) and (B) Complete burns of both hands from falling in fire. Cared for as described in text and ready for grafting in twelve days. (C) and (D) Result of one operation in which both hands were "dressed" in split grafts, that is, a large graft was put over the entire area and sewed accurately in place. There was growth of the graft over the raw parts and it was trimmed away where the surface regenerated. Patient cared for by Drs. McDowell and Guiss, Surgical Service at Barnes Hospital.

require such extensive dissection to free them and the resultant edges and surface may be so rough that immediate grafting is not practical. The fresh wound which results can be kept clean and covered in a few days when it has smoothed out, or the delay may be longer until a good firm granulating surface is established (figs. 2b and 2c, 3, 5, 7 and 10).

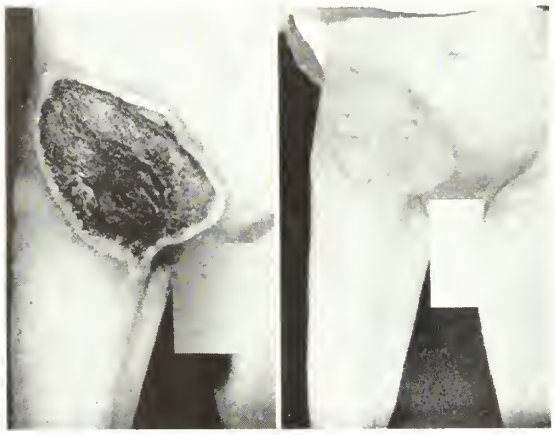
Raw areas following radical breast operations can be grafted immediately, but both on the chest and abdomen, the respiratory movements may make satisfactory dressing difficult.

Leg Ulcers. If the areas can be made clean enough for grafting, the split graft will give adequate support for the lower leg. The problem of preparation includes bed rest, elevation and elastic pressure support of the leg, and mildly antiseptic wet dressings. The granulations are usually shaved off, and if there is a non-granulating base, this is removed, as it is necessary to get down to a blood-supply. Postoperative care is important for protection of the graft and support of the blood column.

The old ulcers and scars of osteomyelitis may be excised and covered with split grafts or a double pedicle flap swung over the tibia, and the defect on the side grafted. For draining sinuses in the bone, grafts may be used directly, but it is usually better to saucerize the bone widely, allow healthy skin edges to drop over the cortical bone edges, and then graft the fresh granulations when they approach the skin level.[6,7] (fig. 11).

Radiation burns. Immediate free-skin grafting after excision of radiation burns has been so hazardous that some operators have preferred to use pedicled flaps.

Fig. 15. (A) Late contracture of the hand due to surface loss without tendon loss. (B) Full-thickness graft restoration after complete freeing of the scar extension of the fingers. (C) and (D) Complete and permanent function shown two years later, from the one operation.



A B

Fig. 16. (A) Wide loss from infection in an inguinal-gland biopsy. (B) Complete healing in one split-graft operation. Freshly healed donor site on inside of right thigh.

Rapid healing in this type of misfortune is important both to patient and hospital.

Frequently the thick split graft can be applied immediately, however, and a permanent surface obtained, although failures may be expected.[6]

Penis, inguinal, and anal regions. When the skin of the penis has been lost, it is thought that free thick-split grafts may suffice for a suitable repair in most instances; and they can be used to effect early healing in ulcerated cases, even if a thicker pedicle-flap repair might have to be done at a later date.[9]

In uneven areas that are heavily contaminated, such as the inguinal and anal regions, the main preoperative preparation will necessarily be soap and water cleansing and saline baths. The grafts will have to be applied carefully and held in place securely. Large gauze folds may be anchored over them with heavy stay sutures tied from side to side, in addition to other firm dressings. In this instance, the main asepsis is firm pressure, much the same as a "stent" graft in the mouth.

Scalp and bare bone. On the scalp, scar epithelium is slow to form and usually gives an unsatisfactory surface with a marked tendency toward repeated ulceration. It is probable that carcinomas develop most frequently in burn scars of this area. Thick split-grafts will suffice for early and permanent covering in practically all cases. Even in the total restoration of foreheads, there is little advantage in full-thickness grafts.

Free-skin grafts will grow on viable periosteum, but will not grow over bare bone, and, therefore, when bone is exposed, growth may finally occur by a bridging over a scar epithelium, or it may be necessary to wait for separation of the bone fragments if there is a necrosis (fig. 12).

Face. Raw areas of the face usually heal quickly, and because of this, they are often allowed to do so, and then repairs are made later. This procedure is somewhat influenced by the involvement of the features which may require pedicle-flap or full-thickness-graft repair. However, if there is continued pain or other reason for hurrying the healing, any area on the face may be cleaned up and grafted temporarily, to await final repair of any damaged features (fig. 13).

It is definitely best not to use Riverdin or small deep grafts on exposed surfaces of the face, neck, arms, and hands.

Hands. In burns of the hands every effort should be put forth to prevent the deep infection that will so rapidly fix tendons and joints, and produce deformities that may never be overcome. The first treatment should be soap and water cleansing, and gentle debridement; then the hand should be wrapped in fine-mesh grease gauze and bandaged. A daily saline soak from one-half hour to an hour and a new dressing with further debridement can then be carried out until the wound is ready for grafting, when it is best to discontinue the use of grease dressings if possible. This method might be called surgical drainage in contradistinction to the sealing of the areas with tannic acid or plaster of paris. Active movement should be encouraged during the soak, the fingers should be dressed apart, and the entire hand kept in the position of function. The average burn should be ready for grafting in three weeks, if tendons have not been exposed, and frequently the single application of a split graft may be all that is necessary. If there has been an extensive deep burn, it is often advisable to "dress" the wound with a thick split graft as soon as the sloughed tendons are separated and the granulations are clean, so that healing may stimulate activity and joint fixation may be limited; later thicker repair can be done.

In "dressing" the areas with a graft, there will be many that will regenerate the surface anyway, but the graft is put over the entire area for assurance that the raw areas are covered, and it can later be cut away from the healed surfaces.[5,6,9] (fig. 14, 15).

Neck. Primary split-graft repairs of open areas on the neck are seldom satisfactory in the end because of surface roughness, contracture, and unsightliness. If the area is large and requires too much time for healing, split grafts may be used first to prevent too much deformity, and final correction can be made later.[5,6] (fig. 13).

Repair of Skin Losses Due to Subcutaneous Infections

These losses may be very large, and as soon as the cellulitis is controlled and the field and general condition is good enough for grafting, many of the areas can be permanently repaired with split grafts. In other cases early resurfacing will save much secondary contraction (fig. 16).

Previous Articles on This Subject

1. The Release of Axillary and Brachial Scar Fixation, Surg., Gynec. & Obst. 56:790, 1933.
2. The Repair of Defects Resulting from Full-Thickness Loss of Skin from Burns, Surg., Gynec. & Obst. 60:379, 1935.
3. The Repair of Surface Defects, from Burns and Other Causes, with Thick Split-Skin Grafts, South. M. J. 28:408, 1935.
4. A Study of Ulcerations of the Lower Extremity and Their Repair with Thick Split-Skin Grafts, Surg., Gynec. & Obst. 63:331, 1936.
5. Homografting of Skin: with Report of Success in Identical Twins, Surgery 1:559, 1937.
6. Restoration of the Entire Skin of the Penis, Surg., Gynec. & Obst. 65:362, 1937.
7. The Repair of Surface Defects of the Hand, Ann. Surg. 107:952, 1938.
8. The Treatment of Burns—Brennemann's Practice of Pediatrics; 1937, W. F. Pryor Co., Hagerstown, Md., vol. 4, chapt. 52, p. 1.

The
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MINNEAPOLIS, MINN., NOVEMBER, 1940

TUBERCULOSIS PREVENTED

In this issue Dr. Jordan presents the results of his work in four Minnesota counties which show definitely the downward trend of tuberculosis through patient and persistent effort. His observations reveal the fatalistic viewpoint that everyone must become infected with tubercle bacilli is a myth. More than ten years ago, Dr. Jordan had a clear vision of tuberculosis control in his sanatorium district. It was his aim to create an environment free from contagious tuberculosis both in animals and man for the children of his counties. He coöperated with the State Live Stock Sanitary Board and the United States Bureau of Animal Industry, and hastened the accreditation of his counties with reference to tuberculosis in cattle. Thus, there was removed a potent source of tuberculous infection among children.

Throughout these years, Dr. Jordan has operated a first-class sanatorium where excellent treatment has been provided for patients with clinical tuberculosis. He has retained in the institution patients with contagious disease so that they could not spread tubercle bacilli in their homes and communities. He has not been content to spend all of his time within the walls of the institution; he traveled about his sanatorium district and in coöperation with the private physicians and clinics, he sought out persons with unsuspected tuberculosis.

One of the highlights of Dr. Jordan's program has been the finding of tuberculosis among members of school personnel. Every teacher in the entire district has been adequately examined for tuberculosis, that is, all have been tested with tuberculin; the reactors have had X-ray film inspection of their chests and any who presented shadows that might be due to tuberculosis have been examined by laboratory and clinical methods. Those who have been proved to have progressive tuberculosis have been isolated and treated. In this manner he has

brought to light fourteen teachers with clinical disease previously unsuspected. This program has been extended to other members of school personnel, such as bus drivers and janitors.

The best criterion of the tuberculosis problem in any community is not the morbidity or the mortality, but the incidence of infection. In his presentation, Dr. Jordan shows how well this problem is being solved. In every area where he tested school children there was a sharp decrease in the tuberculous infection incidence between 1930 and 1940. The most extreme decrease was in an area where in 1932, 11.7 per cent of the children reacted to tuberculin, whereas, in 1940 only 0.7 per cent reacted. Every child who reacts to tuberculin is a potential case of clinical tuberculosis some time during his adult life and Dr. Jordan has reduced this potentiality from more than eleven to less than one for each one hundred children in the above mentioned area.

The veterinarians of the United States have set the finest example of tuberculosis control of all time. By following their example, modifying the program as necessary, for human beings, Dr. Jordan has set an example which should be followed by every community in the nation. It is encouraging to know that many communities are already conducting similar work. Indeed, in the state of New Jersey a law has been enacted which provides the tuberculin test for all high school students, as well as for the entire personnel of the school system. All reactors must have X-ray film inspection of the chest and those with shadows are examined carefully by laboratory and clinical methods. The examination determines whether the shadows are due to tuberculosis. When this disease is found, treatment and isolation, if necessary, are immediately instituted. Any community, state, or nation can promptly create an environment free from contagious cases of tuberculosis if funds are made available and the physicians use modern, standard methods of finding, treating and isolating those who have the disease.

J. A. M.

CONGRESSIONAL BILLS AND THE PUBLIC HEALTH

It is only right that those who are engaged in public welfare work such as members of the medical, dental and nursing professions, and all concerned in public health affairs, should know the attitudes of those who aspire to represent them in the legislative assemblies of our nation. On February 23, 1940, Congressman William Lemke of North Dakota introduced a bill known as H. R. 8625. The bill prohibits the Council on Pharmacy and Chemistry, the Council of Physical Therapy, and the Council on Foods of the American Medical Association from using their usual seals on drugs, foods, and physical therapy devices that have been submitted and accepted, unless authority is first secured from the Federal Trade Commission.

There is also a bill pending in the House Committee which he introduced on January 3, 1939, as H. R. 73. The bill would prohibit any public or private school in the District of Columbia from requiring any form of vaccination or innoculation. On March 10, 1936, he had previously introduced the same bill, H. R. 11717, but it apparently died in the Committee.

H. D. B.

PREPARING FOR WINTER

There is a chill in the air, leaves are falling, and the radio reminds us to winterize the car. The human body may be likened to a car in some ways. It too must be adapted to a seasonal change. It does, to be sure, have more automatic adjustment features: in humidity and heat it maintains water balance and temperature control, in emergencies the endocrines come to the front and set off the needed energy, and in cases of septic infection the leucocytes rally in direct proportion to the virulence of the invading host. But in spite of all these wonders, we must remember that the proper performance of these functions can only be depended upon when the mechanism is normal.

At this time of year, it is common practice to take the automobile to a mechanic for winter protection. Students visit their dentists before going to school. Physicians, what do they do? Well, for the most part they "hide their lights under a bushel." They sneak away to the top floor of some inaccessible building, wrap themselves in cloaks of warped and misunderstood ethics, and play hide-and-seek with the public who would like to be protected even as the car or the teeth.

We do not hesitate to preach the doctrine that it is the duty of the physician not only to heal the sick but to protect the well. Anyone who countenances this doctrine must also subscribe to the further teaching that it is his duty to inform his regular clientele of such needs. The annual check-up-on-your-birthday slogan made a hit and miss campaign. A round-up in the fall might be more effectual. At any rate, this is a good time of year to see to it that all parts function smoothly. It is a good time to check up on blood pressures and weights. It is also a good time to prescribe vitamins and iron and to vaccinate against disease.

A. E. H.

Book Reviews

Injuries of the Skull, Brain, and Spinal Cord, edited by Samuel Brock; 621 pages; Baltimore: Williams and Wilkins Co. Price $7.00.

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This book, edited by Dr. Brock, comprises the contribution of twenty-two men, all of whom have had considerable experience in the field of traumatic conditions involving the nervous system and its protective bony framework. It is quite remarkable that in spite of the number of pages the work cannot be said to be detailed and this gives one an idea of how involved a field the subject matter covers. The medico-legal aspects are taken up in a final chapter and this material is of more than passing interest to anyone associated in the care of cases which fall into the field above mentioned. To those who have examined Dr. Brock's previous work, it is hardly necessary to say that this book is eminently worth while and should certainly serve as a monograph containing all the available and best material that is applied to the present day treatment of injuries involving the skull, brain, and spinal cord.

Endocrine Therapy in General Practice, by Elmer L. Sevringhaus, M.D., F.A.C.P., Professor of Medicine, University of Wisconsin; 239 pages; Chicago: The Year Book Publishers, Inc. 1940.

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Sevringhaus achieves clarity in his valuable advice on treatment by shunning detailed references, dogmatically listing his methods, and charily naming two or three outstanding titles at the end of each chapter. The illustrations are well chosen and liberally used. Drug preparations are given in terms of brand and house names as well as in common terms thus facilitating the use of market preparations. The book is a therapeutic manual and a good one; but more than that it is an authoritative summary of the present state of endocrinology.

An Introduction to Biochemistry, by William Robert Fearon, M.A., Sc.D., M.B., F.I.C., Fellow of Trinity College, Dublin; member of the Royal Irish Academy; second edition, 464 pages plus index; St. Louis: C. V. Mosby Co. 1940.

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Recent gigantic strides in the fields of hormones and vitamins and in chemotherapy have intensified the ordinary physicians' need for a knowledge of biochemistry. Fearon is very readable in a difficult subject. He is somewhat of a philosopher in his biochemical approach to life. He is unclear in his description of world-volume and definitely foggy when he speaks of the four dimensional organism. The book is an excellent reference work for amateurs in the subject and a good text for office-library study.

Eye, Ear, Nose and Throat Manual for Nurses, by Roy H. Parkinson, M.D., F.A.C.S., head oculist and aurist to St. Joseph's Hospital, San Francisco, Calif.; fourth edition, illustrated, 243 pages with index; St. Louis: C. V. Mosby Co. 1939.

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This volume, now in its fourth edition, is a small non-technical treatise on the nursing care requisite in eye, ear, nose and throat cases. All material is presented in condensed and brief form with the idea of avoiding debatable questions and theories. Recent advances in methods and treatment are introduced in this latest edition to keep it up to date. Illustrations and instructions for recording visual fields and for the making of audiograms have been added.

The book is arranged in three parts; the first dealing with the general care of otorhinolaryngological cases, the second with operating room technic, and the third with the problems of the public health nurse. The volume has proved very valuable for classroom work in nurses' training schools. This edition is well printed and extensively illustrated. It can be recommended as a sound text.

Let's Talk About Your Baby, by H. Kent Tenney, Jr., M.D., F.A.A.P., Associate Professor of Pediatrics, University of Wisconsin Medical School; second edition; Minneapolis: University of Minnesota Press. 1940.

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Dr. Tenney printed this book privately for his patients in 1934. Its enthusiastic reception led to this second edition by the University of Minnesota Press. It is written for young mothers in language that does not require a college degree or a medical diploma to understand. The hero of the piece is one Davie who grows up with the chapters and, remarkable child, leads off each chapter with a conversation with the doctor. After the persiflage the transition to the physician's discussion is often awkward. Dr. Tenney's advice is calculated to allay unnecessary fears, and to ensure proper treatment of the baby's ailment. He does not fail to suggest that if the baby gets sick it might be well to call the doctor.

Management of Obstetric Difficulties, by Paul Titus, M.D., Secretary of the American Board of Obstetrics and Gynecology; second edition; St. Louis: C. V. Mosby Co. 1940.

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The first edition of this text appeared in 1937. Since then it has become one of the standard works on the subject. The principal changes in the new edition concern the use of sulfanilamide and related drugs, X-ray pelvimetry, relief of sterility, and technical advances in gynecologic surgery. The author displays a great interest in medical history pertaining to his specialty. The fascinating bits of obstetric history that he manages to include in the text add considerably to the interest of various chapters. The illustrations for the most part are original and well chosen. The frontispiece, a color plate of Friedman reactions in rabbits' ovaries, gives the erroneous impression that the difference between positive and negative tests is slight and difficult to discern. Dr. Titus' style of writing is lucid, his descriptions of the many obstetrical procedures fairly easy to follow.

Diabetes, by Edward L. Bortz, M.D., F.A.C.P., Associate Professor of Medicine, Graduate School of Medicine, University of Pennsylvania; Chief of Medical Service B, Lankenau Hospital; second edition, 296 pages; Philadelphia: F. A. Davis Co. 1940. Price $2.50.

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Diabetes mellitus is unique among human ills in the amount of self-treatment required. The patient must learn to be a dietitian of no mean ability, a urinary chemist, and an expert with the hypodermic syringe. A well written and easily understood manual of diabetes is a necessity for diabetic patients. The present volume is the successor to *A Diabetic Manual*, published in 1936. The protamine and other slow-acting insulins have outdated every diabetic text published before 1939. The main change in the second edition deals with the newer insulins. The book fulfills its purpose of informing the diabetic clearly and concisely of his disease and its treatment. The discussion of pathogenesis in the chapter on symptoms is weak and occasionally inaccurate. The chapter on care of the feet written by a chiropodist would probably have been handled better by a physician. In the dietary section, measurements are given by bulk rather than by weight in most instances, though the author recommends use of the gram scale in learning to estimate food weights.

Textbook of Nervous Diseases, by Robert Bing, Professor of Neurology, University of Basel, Switzerland; translated by Webb Haymaker; from the 5th German edition; 792 pages; St. Louis: C. V. Mosby Co. 1939. Price $10.00.

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This book has always been one of the very best reference works for both neurologists and general practitioners. The recently revised fifth edition translated by Haymaker is certainly no less excellent than the previous volumes. It is concise and adequate and leaves little to be asked for in the way of complete text. The reviewer knows of no better text of nervous diseases and can thoroughly recommend it to his fellow practitioners.

Biochemistry of Disease, by MEYER BODANSKY, Ph.D., M.D., Director of the John Sealy Memorial Laboratory and Professor of Pathological Chemistry, University of Texas School of Medicine; OSCAR BODANSKY, Ph.D., M.D., Lecturer in Biochemistry, Graduate Division, Bellevue Hospital; 645 pages plus index; New York: The Macmillan Company. 1940. Price $8.00.

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This volume is a member of the Macmillan Monograph series and is certainly a welcome one. Until the appearance of this book, one was forced to search in clinical laboratory volumes and very complex volumes on metabolic diseases in order to attempt to bring out the information which is here so aptly assembled. The purpose of the book, as its title suggests, is to demonstrate the coördination of chemical findings and physical disease. Accordingly the various medical diseases are taken up in order and the biochemical changes which may be expected to occur, in time, are discussed one by one. As a result the therapeutic measures are also discussed whenever possible. It is helpful to find that the authors have taken the time and space to constantly remind the reader of the various normal chemical values in which the reader will be interested, so that the variations away from normal as a result of the disease under discussion are quickly understood.

The reviewer feels that this book is one of the most worthwhile that has appeared in recent years, and one whose constant revision will not only be expected by its users, but even demanded by them.

Psychiatry for Nurses, by LOUIS A. KORNOSH, B.S., Sc.D., M.D., and EDITH B. GAGE, R.N.; first edition, 327 pages; St. Louis: C. V. Mosby Co. 1940.

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Unlike the majority of psychiatric textbooks written for nurses, this book is more than a condensation of the subject. The authors have not merely simplified the symptoms, course, and treatment of psychoses for beginners. They have stressed the more common forms of mental disorders, have devoted ample discussion to the methods, observations and management of the patient and have emphasized "the importance of dealing with the whole personality of the sick person, no matter what the particular illness may be."

This text clearly and adequately describes current methods of treatment including insulin and metrazol shock therapy with demonstrations of how the nurse can assist the physician.

Case histories describing the various types of psychoses have been carefully written to enliven the text and to present specific features of each condition in order to give a better understanding of the many factors which come into play when a personality is faced with situational difficulties.

The book is divided into twenty-nine chapters so that the material may be presented for classroom use in either fifteen or thirty lectures. It is generously illustrated with thirty-four exceptionally good cuts.

This book can be enthusiastically recommended to nurses as a curriculum guide. It is authoritative and presents the newer theories and methods of treatment which are generally used today.

Clinical Gastroenterology, by HORACE WENDELL SOPER, M.D., F.A.C.P.; 212 illustrations, 314 pages; St. Louis: C. V. Mosby Co. 1939. Price $6.00.

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This clear-cut and concise work contains within its 314 pages a crystallization of the authors extensive experience in gastroenterology. It is, however, written not only for the specialist, but also for the practitioner who desires a modern interpretation of gastro-intestinal symptoms and their management. There is an abundance of illustrations—this, together with the incisive method of exposition, renders the work one to be recommended not only for study but also for reference in the handling of diagnostic and therapeutic problems.

The Art of Anesthesia, by PALUEL J. FLAGG, M.D., visiting anesthetist to the Manhattan Eye and Ear Hospital; consulting anesthetist to St. Vincent's Hospital, New York; consulting anesthetist to the Woman's Hospital, Sea View Hospital, Jamaica Hospital, Mt. Vernon Hospital, Flushing Hospital, etc.; sixth edition, revised, 161 illustrations; Philadelphia: J. B. Lippincott Co. 1939.

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In the sixth edition of *The Art of Anesthesia,* the author reviews in retrospect an experience of twenty-five years. He states that he is constrained to present this sixth edition as he did the first, "as a groundwork on which the student, intern and general practitioner may acquire a more comprehensive knowledge of the art of anesthesia."

Much revision and rewriting has been included in this sixth edition. The chapter on basal anesthesia has been enlarged to include the latest views on the barbiturates, avertin, paraldehyde and other commonly used basal anesthetics. The author's conclusion to this chapter, is, however, that the older hypnotics, morphine, hyoscine and paraldehyde remain the basic drugs.

Special reference is made to the different methods of anesthesia for brain surgery and the new radical surgical technics.

Recent Advances in Medicine — Clinical, Laboratory, Therapeutic, by G. E. BEAUMONT, M.A., D.M. (Oxon.), F.R.C.P., D.P.H. (Lond.), and E. C. DODDS, M.V.O., D.Sc., Ph.D., M.D., F.R.C.P.; ninth edition with 42 illustrations; Philadelphia: P. Blakiston's Son & Co., Inc.

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At certain regular intervals a new edition of "Recent Advances in Medicine" appears. The present book is the ninth edition and because of the recent strides in medicine occurring during the last three years, a thorough revision of the eighth edition was necessary. There is a new chapter dealing with the chemistry and clinical application of the sulfanilamide drugs. Chapter Two is devoted entirely to vitamins. The contents of Chapter Three are essentially on the kidney, kidney disease, and kidney functional tests. The new developments in diabetes, protamine zinc insulin and diabetic diets are included in Chapter Four. In Chapter Five alterations have been made in the section describing X-ray examination of the stomach and duodenum and a short account of gastroscopy has been added. Chapter Eight is devoted to a new series of electrocardiograms. The Schick and Dick reactions in the method of immunization in diphtheria and scarlet fever have been revised in Chapters Eleven and Twelve.

The ninth edition of *The Recent Advances in Medicine* is truly a real aid to the general practitioner and the internist in keeping abreast with medical progress.

Care of Infants and Children, by HARRY LOWENBURG, SR., A.M., M.D., attending pediatrician Mt. Sinai Hospital, Philadelphia, Philadelphia General Hospital, Department of Pediatrics, St. Luke's and Children's Hospital, Philadelphia; introduction by MORRIS FISHBEIN, M.D.; 300 pages with index; New York: Whittlesey House, McGraw-Hill Book Co., Inc. 1938. Price $2.50.

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Because so many books devoted to the care of infants and children attempt to be all-inclusive, their usefulness is impaired. It was to remedy this situation that this small volume was written. To tell the mother *how to do but not when and why to do* is the objective of Dr. LOWENBURG. This volume attempts to help the mother, the nurse and even the inexperienced young physician. It describes in a very practical manner how to carry out the physician's orders. Simple details have been exaggerated in order to develop the practical aspects of the subjects discussed. A very definite attempt has been made throughout this entire book to avoid any information concerning the nature and treatment of diseases of infancy and childhood. Breast and artificial feeding, child development, hygiene, mention of contagious diseases, care of the sick child and other practical considerations are thoroughly developed. Several chapters in the back of the book are devoted to marriage, pregnancy and the layette.

TRANSACTIONS OF THE MINNEAPOLIS CLINICAL CLUB

Stated Meeting
Thursday, April 11, 1940
The President, James K. Anderson, M.D., in the Chair
(Continued from page 473)

URETEROCELE

With a Report of Six Cases

C. D. Creevy, M.D.†

Ureterocele is an intravesical ballooning of the vesical end of the ureter. It has also been called intravesical prolapse, cystic dilatation, and phimosis of that structure. According to Gutierrez, it was first described in 1834 by Lechler who mistook it at necropsy for a double bladder. It was first recognized cystoscopically by Cohn in 1904.

While it is generally agreed that most cases are congenital in origin, there is considerable difference of opinion as to the mechanism which produces it. It has been variously attributed to a narrow ureteral orifice, due either to the contraction of scar tissue or to mere small size, (fig. 1) and followed by secondary ballooning of the mucosa from the ensuing elevation of the intraureteral pressure; to an abnormally long or vertical submucosal course of the ureter; to weakness of the longitudinal ureteral muscle; or to incomplete absorption of the membrane which according to Chwalla, normally occludes the meatus at one stage of development. It is not infrequently associated with other anomalies of the urinary tract, and particularly with duplication of the ureter.

The symptoms of ureterocele are less often due to the lesion itself than to its complications. The small size of the ureteral meatus causes stasis and later dilatation of the ureter just above the bladder; in severe obstruction, the dilatation may progress to the kidney and ultimately destroy its function.

The smaller lesions are usually silent until infection develops; this may take the form of an acute pyelonephritis or of a chronic silent pyuria. Apparently in consequence of stasis and chronic lowgrade infection, stones may form in the corresponding kidney or in the ureterocele itself, as was reported by Freyer in 1897, and give rise to renal pain or to vesical irritation.

The larger lesions may cause obstruction at the vesical neck with symptoms indistinguishable from those of prostatism. In the female they may prolapse through the urethra and be mistaken for gangrenous or infected tumors.

The diagnosis depends, not upon the history or physical examination, but upon cystoscopy or urography. The appearance at cystoscopy is that of a smooth, globular, translucent mass surmounted by a small ureteral orifice and readily indented by pressure. The appearance at excretory urography is equally characteristic. If the corresponding kidney functions well there is, at the site of the intramural ureter a smoothly outlined, globular or sausage shaped shadow of increased density surrounded by a thin, smooth layer of diminished density. If the kidney is functionless, only a smooth, globular area of diminished density is seen.

The treatment is ordinarily simple. Originally they were excised through a suprapubic incision, but at present all but the largest are destroyed through the cystoscope. The smallest ones are readily destroyed by electrocoagulation; cystoscopic snares or scissors may be used for lesions of moderate size. The most satisfactory method consists in slitting the ureterocele from the wall of the bladder to its summit with the cutting current through a sharp electrode which penetrates both walls. The gaping, redundant mucosal edges are then excised with the loop of a resectoscope. Small stones contained within the ureterocele may then be washed out of the bladder through a cystoscope; large ones may be crushed with a lithotrite and evacuated. Small stones in the ureter or kidney may pass spontaneously after such treatment.

†From the urological division in the department of surgery of the Medical School, University of Minnesota, Minneapolis.

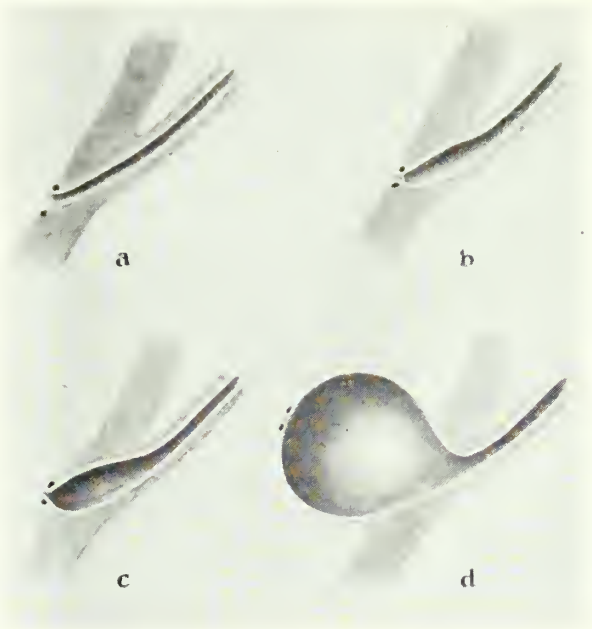

Fig. 1. Origin of ureterocele.

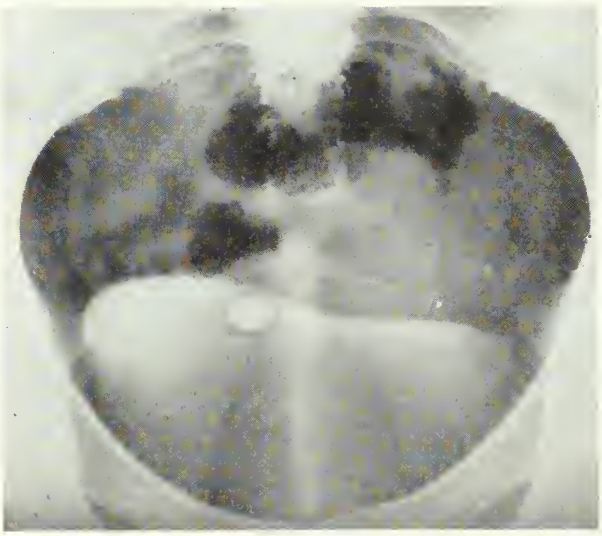

Fig. 2. Case 1. Small ureterocele with good function.

Case Reports

Case 1. Mrs. H. A., aged 22, developed a typical acute right-sided pyelitis with chills, fever, and renal pain in October 1933. Since it kept recurring, she was admitted to the University Hospital on January 4, 1934. There were pus and bacteria in the urine; the excretory urogram outlined normal kidneys with a typical ureterocele on the right (fig. 2). On January 6, this was split and its edges were destroyed cystoscopically by electrocoagulation. In January 1937, she was well, but cystoscopy disclosed still a marked dilatation of the fulgurated orifice; urography disclosed normal kidneys.

Case 2. Mr. L. L., aged 18, was admitted to the Students' Health Service on March 12, 1937, because of gross hematuria of one day's duration without antecedent symptoms. Excretory urography disclosed a functionless right and an hypertrophied left kidney. In the bladder was the typical sharply outlined,

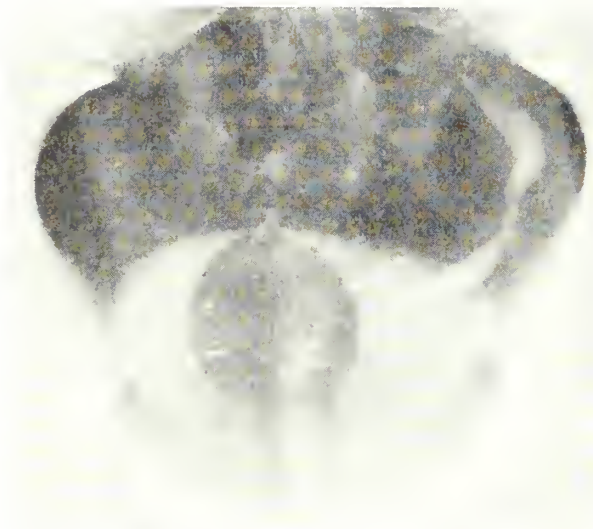

Fig. 3. Large ureterocele with functionless kidney (Case 2).

Fig. 4. Case 3.

Fig. 5. Large stones in ureterocele (Case 4).

Fig. 6. Jackstone in ureterocele (Case 5).

circular filling defect of an ureterocele (fig. 3). At cystoscopy this was 5 centimeters in diameter, smooth, and translucent. It was split; the edges were excised with the resectoscope. Thereafter the patient observed that his stream was much larger than formerly although he had been unaware of any abnormality in it.

A year later the right kidney was still functionless but the urine was clear. Although nephrectomy was mentioned, it was not urged, and the patient has not returned.

Case 3. Mrs. E. M., aged 31, was admitted on February 25, 1938, because of recurrent right renal pain with dysuria, frequency, hematuria of ten years' duration. Plain X-ray disclosed three small stones in the right renal area; excretory urography verified this diagnosis and revealed in addition a typical ureterocele (fig. 4). This was destroyed cystoscopically on February 26 and the ureter was dilated to 14 French. Twenty-four hours later she had passed the stones. She was free from complaints in October, 1938.

Case 4. Mrs. S. T., aged 49, was admitted on May 9, 1938, because of attacks of left renal colic, hematuria, dysuria, and frequency of seven years standing. The urine contained albumin and many red cells. At X-ray there was a large calculus in the bladder with five facetted stones above it in the ureter. Urography demonstrated the ureterocele (fig. 5). On May 11, the ureterocele was split and the large stone was crushed and removed. Three of the stones were pried out of the ureter, crushed and removed. The fourth stone was passed the next day, and the fifth three days later.

Case 5. Mrs. E. G., aged 44, was admitted on June 12, 1939, complaining of attacks of suprapubic pain, aggravated by walking, for 14 years. Two years before admission she passed a stone and was well for six months, whereafter the pain recurred together with dysuria, frequency, and hematuria. The urine was loaded with pus. Urograms demonstrated a large jackstone near the left margin of the bladder. The surrounding wall of the ureterocele was clearly visible as a circular negative shadow (fig. 6).

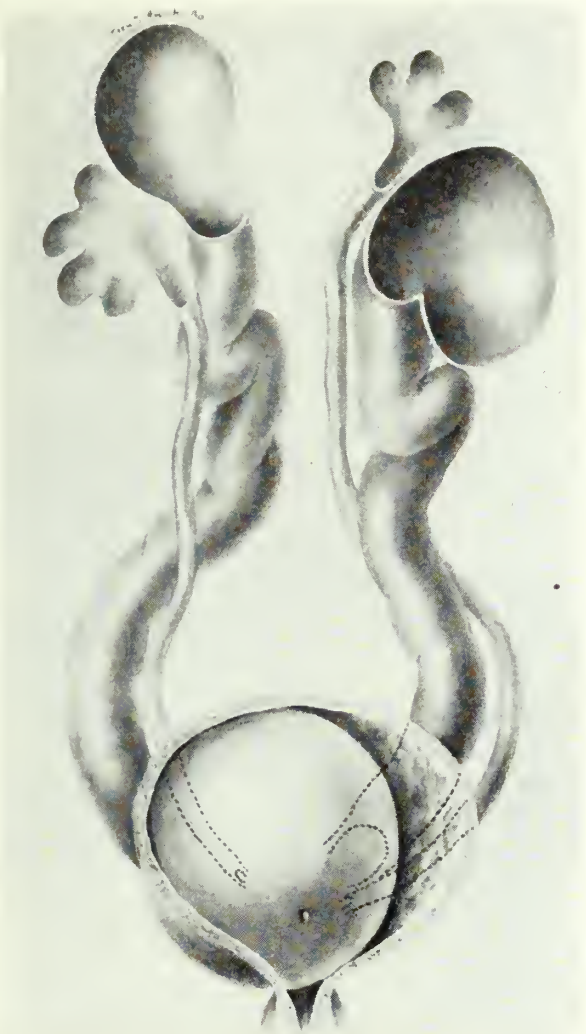

Fig. 7. Bilateral duplication of pelves and ureters. (c) Large ureterocele (Case 6).

Cystoscopic destruction of the ureterocele and litholapaxy were followed by prompt recovery.

It was the pathetic plight of the sixth patient, long neglected, that prompted this report. He was a 7 year old child, D. M., who was admitted on October 30, 1939, because of a lifelong history of difficult urination, frequency and pyuria. He was pale and underweight, and had 300 cc. of purulent residual urine. There was a moderate secondary anemia. Upon rectal examination there was fulness above the prostate although the bladder was empty.

Excretory urograms were not suitable for reproduction, but the drawing shows the situation depicted by it and by cystoscopy (fig. 7). Because of the enormous size of the ureterocele and the small size of the bladder, the former was removed suprapubically on November 7, 1939. In the hope that the hydronephroses would improve, the child was sent home with a cystostomy, but developed an infection with bacillus proteus which led to the formation of stones in the lower segment of the right kidney and in its ureter, as well as in the upper segment on the left.

On March 9, 1940, the upper segment of the right kidney together with half of its ureter were removed and pelviolithotomy and nephrostomy were done. At present there is considerable doubt as to whether the patient can be built up to withstand the extensive surgery still required.

The reader interested in the literature is referred to the excellent paper by R. Gutierrez in Surg., Gynec. & Obst. 68:611-630, 1939.

Discussion

Dr. Ernest L. Meland: I haven't anything to add to this very excellent and interesting paper on ureterocele except that I did see one patient, a woman of 75, who had two large bilateral ureteroceles, causing acute urinary retention by obstruction of the vesical neck. Strangely enough, on finding the ureteral orifices and catheterizing the ureters, it hastened the emptying of the ureteroceles and she recovered enough so she has refused further treatment. That was four or five years ago and so far as I know she has never had any trouble since, according to her family doctor.

I have seen two or three smaller ones that apparently were completely relieved by simply splitting the orifice.

Ernest R. Anderson, M.D.,
Secretary.

Secretary's Letter

SOUTH DAKOTA STATE MEDICAL ASSOCIATION

MEDICAL PREPAREDNESS

The American Medical Association has formed a committee on Medical Preparedness to coöperate with the National Defense Committee, the Army and Navy Medical Corps, the U. S. Public Health Service and all other federal agencies in preparing our nation medically, to meet any emergency.

The function of the Committee (created by the House of Delegates) in addition to coöperation with the above named federal agencies, is to represent the medical men throughout the country and to make recommendations for coördination of Civil and Military Activities along medical lines.

The Committee is made up of a representative from each Army Corps Area in addition to the principal officers of the American Medical Association. The member from the Seventh Corps Area, in which we reside, is Dr. Roy W. Fouts, Omaha, Nebraska. This Committee is represented in each state by a state chairman. Our state chairman is Dr. William Duncan, Webster, S. Dak. The State Committee is composed of the State Chairman, the President and Secretary of the State Medical Association. Each District Society should appoint a committee to represent it.

To date, the principal activity of the Committee has been to get its organization completed and to register and classify the physicians of the country and compile statistics that will be of value in helping to make available, medical men necessary for the various military activities and at the same time provide adequate medical attention for the civilian population. To accomplish this, a questionnaire has been distributed to all physicians. If you have not returned this questionnaire, you should do so at once. Very close to 100 per cent return is necessary if the information collected is to be of any value. The District Committee will be expected to aid in rounding up the stragglers, by personal solicitation, after all possible returns have been secured by mail.

POSTGRADUATE

Any physician in South Dakota who would be interested in obtaining a week's intensive postgraduate instruction in Obstetrics and Gynecology should contact Dr. A. W. Diddle, Dept. Obstetrics and Gynecology, University of Iowa, Iowa City, Iowa. Every second week throughout the winter, two or three physicians will be chosen for this instruction, which will be given without tuition cost. Originally planned for Iowa physicians only, the opportunity is now available to physicians in neighboring states. The only cost to the physician is transportation to and from Iowa City, and very moderate living costs while there. If interested, would ask that you write Dr. Diddle for information. This is your *opportunity*.

. . . . . .

New members affiliating with the South Dakota State Medical Association are Drs. Victor R. Krueger and C. M. Kershner. Dr. Krueger is engaged in general practice at Lake Preston and came to South Dakota from his internship in Duluth. Dr. Kershner is associated with Dr. E. S. Watson in Brookings and came to South Dakota from his Fellowship in Ophthalmology at the Mayo Clinic. Both men became members of the Third District Society at its meeting in Brookings on October 4.

RADIO BROADCAST

The new series of Broadcasts by the American Medical Association is entitled "Doctors at Work." These dramatized stories will be heard over the blue network of the National Broadcasting Company each Wednesday evening at 9:30 central standard time, from November 13 to June 4, 1941. Listen in and tell your patients.

Our own broadcast is still carried over KSOO, Sioux Falls, 1:15 P. M. Sunday afternoons.

C. E. SHERWOOD, M.D., Secretary.

SOUTH DAKOTA STATE MEDICAL ASSOCIATION AUXILIARY MEETING

Mrs. V. Eugene Holcombe of Charleston, W. Va., national president of the medical auxiliary, was in Huron Saturday, September 21, to attend a Board Meeting of the South Dakota State Medical Auxiliary.

The meeting was called at 10 o'clock at the Hotel Marvin Hughitt. Those present were: Mrs. R. A. Buchanan, Huron, state president; Mrs. F. C. Nilsson, Sioux Falls, president-elect; Mrs. G. H. Gulbrandson, Brookings, first vice-president; Mrs. B. M. Hart, Onida, second vice-president; Mrs. J. C. Hagin, Miller, recording secretary; Mrs. J. C. Shirley, Huron, corresponding secretary and treasurer. Also present were committee chairman and district chairmen Mrs. Odah D. Stout, Pierre; Mrs. G. E. Burman, Carthage; Mrs. B. A. Bobb, Mitchell; Mrs. N. K. Hopkins, Arlington; Mrs. M. W. Pangborn, Miller; Mrs. A. D. Hyden, Sioux Falls.

Mrs. Holcombe stressed coöperation in the distribution of the *Bulletin*, an official publication of the organization.

The Huron members were hostesses at a 12:30 luncheon given in honor of Mrs. Holcombe, who responded with a timely address. Mrs. Holcombe said in part: "Nineteen hundred forty finds the Woman's Auxiliary to the American Medical Association entering upon the nineteenth year of its career with a membership of 24,000. The growth in membership of any organization over a period of years would be of no particular value to the cultural, artistic and educational development of a nation were it a matter of figures only. But the practical idealism and high purpose of this organization has placed the medical auxiliary in the front ranks of useful and usable organizations.

"The Auxiliary was primarily organized as a social unit until mere social activities were eclipsed by the need of greater demands. As the years have passed our responsibilities have increased. The doctor's wife makes no attempt to practice medicine or discuss scientific medical topics. She does, however, attempt to acquaint herself with local health needs, coöperate with state, county and city boards of health, lend active assistance to all constructive health projects, national, state and local, render assistance in selecting books on health and allied fields for local libraries, obtain papers, charts and exhibits for schools, clubs, church and state fairs, coöperate with P. T. A.'s, in their summer roundup programs and other organizations with similar health projects, and join with the press in keeping the community health conscious."

The information received from Mrs. Holcombe inspired us with enthusiasm and was greatly appreciated.

MRS. G. E. BURMAN,
Public Relations and Publicity Chairman.

News Items

The American Student Health Association will hold its annual meeting at the University of Michigan, Ann Arbor, Michigan, on December 27 and 28, 1940.

Dr. John D. Moore, Fargo, North Dakota, was elected president of the Central Association of Obstetricians and Gynecologists at its twelfth annual meeting in Indianapolis. He will take office at the next session in New Orleans, 1941.

Dr. Karl H. Pfuetze is the new assistant physician at Mineral Springs sanatorium at Cannon Falls, Minnesota. He has spent the past three years at Nopeming, the St. Louis county sanatorium.

Dr. E. H. Loenholdt of St. Paul, Minnesota, has joined the staff of the Interstate Clinic in Red Wing. He will specialize in diseases of the eye, ear, nose and throat.

Five North Dakota physicians were initiated as fellows of the American College of Surgeons at Chicago, October 21, 1940. They are Drs. Herbert A. Carlson, Minot; G. Wilson Hunter, Fargo; Robert W. R. Rodgers, Dickinson; Glen W. Toomey, Devils Lake; and Robert W. Vance, Grand Forks.

A new medical center for Albert Lea, Minnesota, came into being with the formation of the Albert Lea Medical and Surgical center by a group of local physicians. Those included are: Drs. W. L. Palmer, C. Foster Palmer, D. L. Donovan, L. C. Barr and H. B. Neal.

Dr. A. R. Foss is the new president of the Missoula (Montana) Tuberculosis Association.

Dr. R. Wynn Morris, Helena, Montana, was initiated into the American College of Surgeons at the convention held in Chicago, October 21.

Dr. Bertha Brainard, Jamestown, North Dakota, former city health officer, is now in Corvallis, Oregon, where she is in charge of the student health service at the Oregon State College.

Dr. Frank J. Ankner, formerly of Chicago, recently joined the staff of the Bratrud Clinic in Thief River Falls, Minnesota.

Dr. Roy Christie, formerly of Bowbells, North Dakota, has moved to Eureka, South Dakota.

Dr. A. D. Mattson, St. Paul, is now associated with Dr. C. J. Henry, Milaca, Minnesota.

Dr. G. A. Dodds, formerly superintendent of the state sanatorium at San Haven, North Dakota, is now practicing in Valley City, North Dakota. He spent the past year in Philadelphia, where he took postgraduate work in surgery at the University of Pennsylvania.

Dr. Harold W. Fuller has become associated with Dr. C. J. Bresee in Great Falls, Montana. Dr. Fuller is a native of Anaconda.

Dr. E. L. Sederlin, formerly of Laramie, Wyoming, has become city health officer of Fargo, North Dakota, to replace Dr. H. J. Skarshaug, who is now at Washburn, North Dakota.

Dr. Bertram S. Adams, head of the Adams hospital, Hibbing, Minnesota, was selected as the seventh annual Honor Night choice by the Hibbing Elks lodge and honored by his fellow townsmen at a testimonial dinner October 22. Dr. Adams is president of the Minnesota State Medical Association.

Officers of both the Mississippi Valley Conference on Tuberculosis and the Mississippi Valley Sanatorium association were elected at the three day meeting held in St. Paul, Minnesota, recently. Dr. Bruce Douglas of Detroit was elected president of the conference and Dr. George Turner of Chicago, president of the association.

Dr. F. E. Bunting, Mandan, North Dakota, "dean of the medical profession in the Missouri Slope area," was honored by physicians at a dinner recently. Dr. Bunting retired October 1 after 52 years of medical practice.

Dr. John F. McGregor, Great Falls, Montana, has been named county physician to replace Dr. Robert J. McGregor, who resigned.

Dr. Russell W. Morse, Minneapolis, was installed as president of the Hennepin County Medical Society at the annual meeting October 7.

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis, Station WLB, University of Minnesota, and KDAL, Duluth. The speaker is William A. O'Brien, M.D., professor of preventive medicine and Public Health, Medical School, University of Minnesota. The program for the month will be as follows: Nov. 2—Eye Injuries; Nov. 9—Glaucoma; Nov. 16—The Crosseyed Child; Nov. 23—Cataracts; Nov. 30—Children's Dentistry.

The annual dinner meeting of the general medical faculty of the University of Minnesota Medical School was held on Friday evening, October 4, in the new Coffman Memorial Union. Dr. Morris Fishbein was the guest of the evening and discussed "The Role of the Medical Profession in National Defense," and "Medical Writing." The remainder of the program was given over to a presentation of the more significant developments which have occurred in the Medical School during the past year.

Dr. J. A. Myers of Minneapolis addressed the Bergen County Medical Society at Bergen Pines, Ridgewood, New Jersey, on October 8. He addressed the Fort Wayne Medical Society October 15.

The first annual Minnesota Medical Foundation lecture will be presented at the University of Minnesota Medical School on Tuesday evening, November 12. Dr. Conrad A. Elvehjem, professor and head of the department of biochemistry, University of Wisconsin, will speak on "The Biochemistry of the Vitamin B Complex."

Dr. A. J. Campbell of Los Angeles, California, has taken over the duties of chief medical officer at the veterans' facility, Hot Springs, South Dakota.

Necrology

Dr. George A. Sarchet, 66, Mobridge, South Dakota, prominent physician and district surgeon of the Milwaukee Hospital Association, died at the Mobridge hospital, September 21, 1940.

Dr. L. G. Eastman, 67, Hazen, North Dakota, died in his office September 21, 1940. He had practiced in the Hazen vicinity since 1902.

Dr. Victor A. Young, 65, Duluth, Minnesota, died at his home September 20, 1940.

Dr. George M. Jennings, 60, Missoula, Montana, died October 14, 1940. He was chief surgeon of the Northern Pacific railway hospital in Missoula until ill health forced his retirement July 1.

Dr. John P. Hiebert, 64, of Minneapolis, Minnesota, former chief of staff of Asbury hospital, died October 11, 1940.

Classified Advertisements

DOCTOR WANTED

Good location for physician and surgeon at Bowbells, N. Dak. County seat town. Large pay roll. Population 800. Good, diversified farming. Agricultural territory. Coal mine. Good, modern, fully equipped 10-bed hospital owned by city. Good roads. First class high school. Five churches. No doctor at present. A large and lucrative practice for the right man. For further information get in touch with C. S. Summers, President of Bowbells Civic Club, Bowbells, N. Dak.

FOR SALE

Used Adams X-ray machine, 10 M.A. and 47 P.K.V., mobile, suitable for extremities or dental. 621 Kenwood Pkwy., KEnwood 6937, Minneapolis.

PHYSICIAN WANTED

Resident physician wanted immediately, Sanitarium close to Twin Cities. Address Box 691, care of this office.

BLIND BOX NUMBERS

"Blind" box numbers are addresses placed on classified advertisements which say "Address Box , care of this office." They are used by advertisers to conceal their identity and no information will be given in regard to them by this publication. To answer, write a letter and address it to THE JOURNAL-LANCET, Box No. , and mail it or bring it to this office.

NEW INSTRUMENTS

"Medical Index" keeps you posted on the new professional equipment, surgical instruments, medical supplies, orthopedic appliances. Over 50 new products born of the demands of medical science and ingenuity of man described and illustrated monthly. The only publication in the professional field exclusively devoted to products of a medical or surgical application. Year $2.00. Sample copy 25c. Write Medical Index, Inc., 22-F West 48th St., New York.

Advertiser's Announcements

PURE LUTEINIZING HORMONE ISOLATED FROM ANTERIOR PITUITARY GLAND

The isolution in pure form of the luteinizing (interstitial cell-stimulating) hormone of the anterior lobe of the pituitary gland of swine was announced in the August 23rd issue of *Science* by Drs. Shedlovsky and Rothen of the Rockefeller Institute for Medical Research, New York, and by Drs. Greep, Van Dyke and Chow of the Squibb Institute for Medical Research, New Brunswick, N. J. The achievement is specially noteworthy because the chemical nature of the endocrine principles of the anterior pituitary gland renders them difficult to isolate and analyze since they are proteins or complex polypeptides which are extraordinarily vulnerable to most types of ordinary chemical manipulation.

Proof of the purity of the luteinizing hormone was established by solubility studies in various buffer solutions, by obtaining electrophoretic patterns employing a Tiselius apparatus and by observations of the sedimentation rates in the ultracentrifuge. From the data thus obtained and from the determination of the diffusion constant, the molecular weight of the pure luteinizing hormone was estimated.

The significance of this announcement to workers in endocrinology is that it contributes to the elimination of much of the pre-existing confusion with regard to the possible number and effects of the gonadotropic hormones which have been postulated by earlier investigators. In an earlier paper the Squibb Institute workers announced the separation in *nearly pure form* of not only a luteinizing (interstitial cell-stimulating) hormone but also a follicle stimulating (gametogenic) hormone from the anterior pituitary gland. It may be assumed that by using the newest tools for physical chemical investigation which were so helpful in the isolation in pure form of one of the anterior pituitary gonadotropic hormones that the other will likely be obtained as a pure protein.

VITAMIN ADVERTISING AND THE MEAD JOHNSON POLICY

The present spectacle of vitamin advertising running riot in newspapers and magazines and via radio emphasizes the importance of the physician as a controlling agent in the use of vitamin products.

Mead Johnson & Company feel that vitamin therapy, like infant feeding, should be in the hands of the medical profession, and consequently refrain from exploiting vitamins to the public.

The JOURNAL LANCET

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New Series

Routine Ocular Muscle Investigation*

Walter H. Fink, M.D.
Minneapolis, Minnesota

THERE is no part of the study of ocular refraction which offers more interesting and complicated problems than that pertaining to the coördination of the two eyes, in the production of comfortable single binocular vision.

Muscle problems have been recognized for centuries because of the outward manifestation of the anomaly, and, through the ages, ophthalmologists have struggled with the condition. In no branch of ophthalmology are the methods of examination so little standardized as that pertaining to ocular muscle imbalance.

Much of this unnecessary confusion has arisen in the field of muscle diagnosis because of lack of an adequate plan of investigation. In fact there are some who advocate entirely different methods for the same condition. With this state of uncertainty it is understandable why many of us are prone to disregard the muscle examination or do it inadequately and thus fail to obtain the proper analysis of the case.

A refraction is composed of two major divisions, (1) the correction of the refractive error and (2) the investigation of the binocular mechanism. Most examiners do not consider the refraction complete without the two phases investigated. It is true that certain cases are purely a question of proper glass and the muscle trouble resulting from this glass-need becomes rectified after the glasses have been worn for a time. From this we must not assume that it applies to all patients who come for refraction. A good percentage of cases may have both glass correction and a muscular defect, whereas certain other cases are primarily muscular and the glass problem does not enter. In the former group, glasses will assist and the patient is more comfortable, but we are not doing justice to the case when we ignore the muscle defect. As to the latter group, refraction does not enter into the problem and the muscles are primarily at fault. Such cases cannot be diagnosed unless a muscle analysis is made.

Refractions comprise at least 80 per cent of an oculist's work and each patient is a potential muscle problem. It is evident, therefore, we should look upon the refraction cases both as a lens investigation and a muscle investigation; the latter being in many cases the key to the whole problem.

What a Muscle Examination Tells Us

In performing a routine muscle examination we have in mind certain objectives. The examination is an inquiry into the efficiency of the mechanism which has to do with the alignment and adjustment of the two eyes so that unity of action is accomplished permitting the binocular visual action.

The routine tests serve to compare this mechanism with a standard mechanism. As we have in the ocular muscle functions various components of action, it is necessary, in order to intelligently appreciate the tests, to have a knowledge of the specific function each test has to evaluate.

In efficient ocular muscle action where symptoms of eyestrain are not present, there exists a normal balance of forces with reserve strength. Where one factor is

*Presented before the South Dakota Academy of Ophthalmology and Otolaryngology, April 25, 1939, Aberdeen.

abnormal, the others must compensate, and if this is not accomplished, ocular efficiency is low and eye strain results. Certain terms are applied to the various states and are defined as follows:

Orthophoria is a condition of perfect ocular muscle balance assumed by the visual axes when the influence of the fusion faculty has been eliminated by dissociation and when the tonic influence is normal.

Heterophoria is a departure from the ideal and the tonic impulses are deficient resulting in a deviation of the visual axes. When single binocular vision is made impossible, the eyes assume a position which is dependent on the inborn tonic innervation, provided that accommodation is not in force. The synergistic action of opposing muscles for each eye is an inborn reflex, and its function is the adjustment of the mechanism in order that it may respond smoothly to stimulation when work is required.

Fusion faculty is the capacity to make up the deficit if the position assumed by the visual axes under distance dissociation is not parallel, and if single binocular vision is present. In either esophoria, exophoria, or hyperphoria, the fusion faculty supplies the correcting influence; it must always be equal in amount and opposite in direction to the tonic imbalance. This is an example of a learned reflex coming to the assistance of a faulty reflex present at birth.

It follows that an analysis of the fusion faculty, as it functions in the maintenance of ocular balance, is of utmost importance. The demand upon the fusion power may be disproportionate to the supply, under which condition single binocular vision may be maintained under strain, as evidenced by symptoms of distress. In the presence of inadequate fusion power, single binocular vision may be lost, in which event either diplopia will result or there will be suppression of vision in one eye. If suppression of vision occurs it is likely to take place so quickly that diplopia is rarely noticed by the patient, and he is frequently unaware that binocular vision has been lost.

Fusion power is therefore that amount of power mediated by the fusion faculty. It is the modification of the tonic innervation brought about as the result of the desire for single binocular vision. The extent to which this faculty can be used is measured by the duction tests.

The ductions measure the amount of innervation that can be supplied in the interest of fusion, or with single binocular vision in effect, the degree to which the fusion faculty is able to resist prismatic action, is a measure of the duction power. It is also referred to as "fusional amplitude." In estimating the duction, we are not testing actual muscle strength but estimating the amount of muscle movement in the interests of single binocular vision.

In case binocular single vision does not exist, but there is diplopia or monocular vision, our tests serve to analyze the situation by investigating the mechanism at fault. This may prove to be a paresis or a paralysis of an individual muscle or muscles, defective fusion, or both. In other cases of long standing the tests inform us as to other factors or defects which have been superimposed secondly upon the primary factors.

It is apparently a law of nature that in order for us to see singly and comfortably, the visual axes must be directed to the object of attention, without the expenditure of undue nervous energy. In order to discover if ocular muscle imbalance is a cause of the discomfort commonly called eye strain, it is necessary that we learn to measure the ocular muscle balance in given cases, determine the amount of the convergence necessary to produce single binocular vision, and measure the reserves of fusional power available for the individual. From these determinations, it is possible to find out whether the patient may reasonably be expected to tolerate the required prolonged convergence while using his eyes for close work.

Application of Tests

In the textbooks and in the clinical teaching of the subject of ocular muscles, much confusion has arisen because the examiner is not instructed as to the proper sequence of applying the tests. He is given a list of tests and the purpose of each, but when facing the patient in his office, away from teacher and text, he is confronted with the problem of a logical approach.

A systematic method of examination of the muscles is as important as in a general physical examination, because a routine prevents the examiner from overlooking an important procedure.

It is true in a busy office we must be practical and omit all the unnecessary. This omission may be excessive and costly if we carry it too far. The complaint of lack of time is unfounded because a thorough muscle examination, like the fitting of the lenses, is important enough to justify the necessary expenditure of time. In the average case a few minutes are consumed doing the routine muscle investigation and, when a complicated case requires more complete testing a special appointment should be made to devote the necessary time. This is similar to what is done when we do perimetry and find evidence of glaucoma and testing of the fields is necessary. The time spent is not excessive if it is correctly utilized. This is accomplished by knowing the technique and having an efficient system. To establish an efficient system of investigation, it is necessary to know the function of each test and how to apply it to the case being examined. The classification of Duane is especially valuable in this respect.

It goes without saying that all tests are not indicated in every case, but having a logical mental conception of the tests, they are used as indicated. It can be crudely compared to golf. We have a bag of clubs and in the course of the game we select certain clubs as the situation warrants, some clubs we use on every hole and others such as the niblick we fortunately use but rarely. The same applies to the muscle test. From our bag of tests we select the indicated test to fit the situation. Some tests we use routinely, others only in a complicated case.

For simplification, the tests have been divided as follows: *Preliminary examination,* which when performed divides the cases as either *heterophoria* or *heterotropia.* The heterophoria is again divided into *necessary tests* and *special tests* for complicated cases. A third major division should be listed as *follow-up* examination to be done after the patient returns for check-up and has become adjusted to the new correction.

Tests Arranged According to Order of Clinical Application

The tests having a related technique are grouped irrespective of the fact that the information obtained is not in sequence. Such grouping facilitates the examination.

A. *Preliminary examination*

(Examine without and with old correction as indicated. Star [*] refers to tests to be used in all cases.)

1. *History.

2. *Vision—The vision of each eye without correction is recorded separately, both for distance and for reading.

3. *Inspection—Valuable information is obtained such as nystagmus, facial assymetry, head tilting, etc.

4. *Pupillary reactions—Three tests of the pupillary reflexes should be made; the accommodation and convergence reflex, the response to direct light, and the consensual.

5. *Interpupillary distance—This should be measured for every case. It is necessary for measuring the convergence in degrees, for adjustment of the instrument used in examination, for writing prescriptions and for checking both the old and the new spectacles. It is quite possible that an error in centering the lenses which the patient has been wearing may be the sole cause of his symptoms. Such an error could not be detected without a knowledge of interpupillary distance.

6. *Monocular movement—Each eye is observed as it is rotated in the six cardinal fields of action. This test shows whether each eye by itself can move freely in all directions. For more accurate measurements of the rotation limitation the perimeter test is used.

The ocular excursions are measured on a perimeter by having the eye follow an object which is moved along the perimeter arm. An exact measurement of the excursion of the eyeball is possible and a comparison with the normal shows the field of muscular action which is deficient.

7. *Binocular (Conjugate) movement—Both eyes are rotated in the six cardinal fields of action and the visual axes fixate the given object in all directions of gaze.

The following two objective tests are used. They are independent of binocular vision and can be employed when there is suppression.

a. Excursion test in which the eyes follow a small object in the six cardinal fields to note whether there is a lag or if the eyes follow steadily and whether both eyes keep pace with each other. This is a valuable test because it is an accurate index of the unity of action between the eyes when not in the primary position.

b. Comitance test—To determine the presence of paralysis, it is necessary to note the excursions of the eyeballs, not only in the lateral direction, but also in all four oblique directions. This is most effectively performed by dissociating the two eyes by a card and watching the effect of rotation on both eyes in the six cardinal fields.

8. *Accommodation near point—This is tested for each eye and both eyes together. The near point (punctum proximum) is the distance at which the eye can see clearly small objects under maximum accommodation. A knowledge of the near point of accommodation enables the refractionist to determine the power of accommodation.

A test of the accommodation should be made in all cases with a correction of the ametropia. If the fine line is used as the test object, the vision should be at least 20/30 to have the test reliable. In poorer vision than 20/30, the Jaeger test type may be used. In cases of presbyopia, a presbyopic addition should be made. Each eye should be measured separately and the two together, as it adds only slightly to the time of the test. A subnormal accommodation is found so frequently that this test should never be omitted.

9. *Near point of convergence—This is tested and the point of deviation noted. In addition, note the deviating eye.

It is essential that a careful study be made of this important function. It is often necessary to base the method of orthoptic or surgical procedure on the finding. The test should be made several times and denoted relative or positive.

10. *Monocular fixation—The fixing ability of each eye is noted.

11. Binocular fixation—

1. *The binocular fixing ability is noted. Inspection test will show whether fixation is central or eccentric, or whether, as in cases of high grade amblyopia, the patient cannot fix at all.

2. Screen test (the parallax test is done in conjunction if the patient is intelligent). This is a good test for binocular fixation and a most efficient dissociation test for estimating the amount of deviation. The parallax test is a subjective test which may be done in conjunction with the cover test. In the test we ask the patient whether the object he is looking at seems to move or not, as we are passing the card from eye to eye in making the screen test.

a. *For distance. The deviation, if present, is measured by neutralizing the movement with prisms. The fixing eye is determined.

b. *For near (33 cm.). The deviation, if present, is measured by neutralizing the movement with prisms. The fixing eye is determined.

c. *For cardinal fields. The deviation, if present,

is measured at 33 cm. in the six cardinal fields and the fixing eye is also noted.

d. The comitance test is performed in the six cardinal fields if the above findings justify it.

12. Diplopia fields. Field of double vision is tested if the above indicate the need for more information. This can be done in the examining chair with a small flashlight, or for greater accuracy, by plotting it on a tangent screen.

This is a valuable subjective test because first it confirms the findings of the other tests, and second it shows graphically the limits of the fields of double and single vision. It is not a routine test but used in more complicated cases.

B. *Refraction*

(Examine with or without cycloplegia as indicated). If heterotropia, measure the deviation while under cycloplegia.

C. *Postrefractive examination*

With the new correction determined and the cycloplegic effect gone, (if cycloplegia has been used), the examination proceeds. The new correction is to be worn.

1. Heterophoria (Examine with correction)

a. *The dominant eye is determined—This test is very important although seldom employed. It serves to designate the major eye. The dominant eye must not be inhibited by over-correction or any procedure which will tend to suppress its action. It is comparable to the dominant hand. In the dissociation tests, the dissociating element is frequently placed before the less dominant eye. The less dominant eye is less skillful and may be termed an assistant to the dominant eye. It does not necessarily mean that the dominant eye is the better seeing eye or has less refractive error.

b. *Accommodation near point is determined for each eye and for both eyes together.

c. *Convergence near point is determined noting the deviating eye.

d. Phoria tests—Constitutes the production of diplopia by one of the dissociation methods, in order to define the position of the visual axis without the influence of fusion. It is used to determine the tonic relationship of the eyes when binocular vision is abolished. The amount of heterophoria is a deficiency which should be known as it shows how much the fusion power must correct in addition to its usual function.

1. *Screen and parallax as in above: For distance — For near — For six cardinal fields. Comitance test repeated if indicated.

2. *Maddox rod (in phorometer) and cover test. In this test a maddox rod is used to dissociate the eyes. The dissociation is made more complete by covering and uncovering one eye as the reading is taken. It is considered very accurate. (For distance — For near.)

3. *Prism displacement (in phorometer) For distance — For near. The displacement test consists in creating insuperable diplopia in a vertical direction to determine the presence of a lateral imbalance, and insuperable diplopia in a lateral direction to make manifest a vertical deviation.

4. Maddox wing or Bielschowsky test for near.

e. Vergence of ductions. *For distance — *For near. Noting blur, break and recovery points.

These tests are especially important in considering the binocular or coördinated movements of the eyeball because they give us an accurate measurement of the stability of the binocular mechanism.

With single binocular vision in effect, the degree to which the fusion faculty is able to resist prismatic action is measured by the duction tests (fusional amplitudes). The efficiency of the ocular muscles in the maintenance of comfortable single binocular vision is determined by the relation of the phrias to the fusion amplitudes.

The classic conception of duction tests is that they determine the amount of prism base-out, in, up or down which the eyes can overcome in order to maintain single binocular vision. They are for this reason also referred to as "breadth of fusion tests." This conception is purely quantitative elements involved in an analysis of the meaning of duction test and findings, namely, the blur, break and recovery points.

In making duction tests one must take into consideration that there are generally three elements involved, and that each of these has a special significance. There is the blur point, the stage at which the accommodation comes into play with a change of convergence. Then there is the break point, the state at which an absolute maximum of convergence or divergence is produced, indicating a quantitative limiting value to the activity involved. Finally, there is the recovery point, the stage at which single vision is again resumed. This value shows the sustaining power of the function involved and is largely of qualitative significance. Duction tests made with a view of these three elements are helpful in every case and are especially useful in clarifying obscure cases of refractive and muscular anomalies.

f. Fusion and Stereopsis. Four dot test—Depthoscope—*Stereoscope.

The two eyes may give rise to simultaneous, to binocular, or to stereoscopic vision, respectively. Simultaneous vision does not imply adjustment of visual axes; this type of vision is demonstrated under the ordinary methods of dissociation, such as the Maddox rod test, diplopia under prisms and other so-called "sepa-

rating" tests. On the other hand, binocular single vision presupposes simultaneous vision and requires that the two visual axes shall meet at the point of fixation. Stereoscopic vision and appreciation of depth may be considered to be the last stage in the development of binocular single vision.

g. Reading test if indicated—A practical application of coördinated ocular movements is found in the test for reading ability. So frequently we see children who have normal eyes from the standards of our ocular tests, but difficulty exists when reading. It is, therefore, of practical importance to know the degree of coördination of the eye muscles in the act of reading.

The Gray Oral Reading Check Tests as now published by the Keystone-View Company, are of value.

h. Occlusion if indicated—This test may give information in certain cases. In cases where the heterophoria is high or uncertain it should be used, as a more relaxed state of the binocular apparatus is obtained; secondary spasms are relaxed and a better idea of the total hyperphoria may be obtained.

2. If heterotropia (Examine with correction).
   a. Monocular rotation in six cardinal fields.
      1. *Inspection.
      2. Perimeter (if indicated).
   b. *Binocular rotation in six cardinal fields.
   c. *Convergence near point.
   d. *Accommodation.
   e. Measurement of deviation (was measured also under cycloplegia).
      1. Screen and Parallax. *For distance — *For near — *For six cardinal fields — *Comitance in six cardinal fields.
      2. Corneal reflex method. This test is used to measure the amount of deviation. The position of the corneal images indicate the degree of deviation. The method is quick but not accurate.
      3. Perimeter method (measure angle Kappa). This method is used for greater accuracy. The amount of deviation is measured with the perimetric arc. The method requires more time but is very accurate. When measuring the angle of squint by objective means, it must be remembered that the visual axis does not always necessarily pass through the center of the pupil or the cornea.
      4. Synoptophore if available.
      5. Field of double vision if greater accuracy is indicated.
   f. Binocular vision and stereopsis. *Four dot test — *Stereoscope. As was pointed out originally by Worth, there are three grades of binocular vision:
      I. Simultaneous macular perception.
      II. True fusion with some amplitude.
      III. Sense of perspective or stereoscopic vision.

      Grade I slides (such as the bird on one slide and a cage on the other).

      Grade II slides contain a picture which is similar in its chief components.

      Grade III vision. The slides or targets to be used for testing stereoscopic vision, carrying pairs of pictures of the same object, which are not identical.

(Star [*] refers to tests to be used in all cases. Absence of star refers to tests to be used when indicated.)

Conclusion

The presentation is an expression of the writer's personal experience in dealing with one phase of the extraocular muscle problem. It is admittedly open to criticism but, realizing the lack of unity of opinion in this field, it seems justified to express opinions based on the results of one's experience. Perhaps this effort will stimulate others to do the same and, by such expressions, unity of opinion may be obtained. We shall thus establish facts in this now very uncertain but important field. The oculist who made the statement that "we are forty years behind in our muscle work" was undoubtedly exaggerating the situation, but an honest analysis of what we are doing suggests that he may be too nearly right.

Selenium Poisoning in the Human*

A Preliminary Case Report

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SELENIUM as a cause of the livestock disease of the Great Plains regions, known as alkali disease,[1] has aroused much interest in agricultural and scientific circles during the past few years. The main interest has been shown in connection with the livestock industry[2] in which selenium has caused losses of considerable importance. It has also been suggested that areas be thrown out of use as farm lands because of the known toxicity of grasses and grains grown upon them. Many investigators have reported the effects of selenium poisoning in various species of animals[1,2,3,4,5] and a few reports are found in the world's literature of various effects of selenium in the human.[6,7,8,9,10,11]

This preliminary report is on the first described case of chronic selenium dermatitis in the human caused by the ingestion of selenium from natural sources and the first attempt to effect its elimination from the body tissues by the administration of bromobenzene.

A rancher, 58 years, was first seen at this clinic on January 14, 1939. He complained of a severe acute dermatitis of the bearded regions, the pubic regions, the hairy surfaces of the arms and the hairy surfaces of the thighs mainly on the anterior portions. He stated that this condition began two months before as a small dry lesion on the upper lip. Gradually, the eruption spread over the face and around the regions of the eye. It was all very itchy. The lesions did not weep unless injured by scratching and in about a month the lesions had spread to the arms and the thighs. There were no previous attacks of a similar character. The cause of the disease was attributed by the patient to the fact that he had been mixing concrete a few days before the onset of the disease and that he suspected that some of the concrete dust had started the condition. The symptoms gradually increased in severity and the patient noted that the skin in the regions involved had become deeper red in color and that it had become thickened. He consulted local physicians who gave him lotions to apply which gave him very little or no relief. He had lived in this same locality at Reva, South Dakota, (Harding County) for over thirty years, most of the time being spent on the same ranch.

He had no previous skin disease of any kind, except the "itch" when he was a school boy and a dermatitis when a young man which he was positive was due to poison ivy.

His past history was as follows: His health had always been good. He had had no operations, no serious illnesses or injuries, and had never consulted a doctor for any reason. His family history was entirely irrelevant. During the past few years he had been entirely well, except for an occasional slight cold, and had lived a normal, usual, vigorous, hard-working, outdoor life common to the ranchers of this locality.

The physical examination revealed the following: The patient was slightly built, stoop-shouldered, with a peculiar brownish-bronze tinge to the skin over the entire surface of the body. Temperature was 99°. Hemoglobin was 88 per cent by the Sahli method. Red blood cells were 4,400,000; white blood cells were 11,850; differential blood counts were as follows: 15 per cent lymphocytes, 5 per cent mononeuclears, 1 per cent eosinophiles, 1 per cent basophiles, 78 per cent polymorphonuclears. The urine was as follows: specific gravity 1.020; clear, normal color, no albumin, no sugar; microscopic entirely negative. The eye, ear, nose and throat examinations were essentially negative, except for some evidence of a chronic rhinitis and maxillary sinusitis. The thoracic cage was normal except for a moderate kyphosis. The heart was normal in size, shape and position and an electrocardiogram presented normal tracings. The lungs on physical and roentgenological examinations were normal. The abdomen was negative. There was no enlargement of liver or spleen. The kidneys were normal, and there were no masses or areas of tenderness made out. There were no hernias. The reflexes were normal to slightly hyperactive, and there was no evidence of nervous disease. The prostatic expression was normal. Rectal examination was normal.

The skin examination was as follows: there was an acute dermatitis involving the bearded region, upper and lower lips, the upper and lower eyelids and extending down the neck as far as the bearded regions. There was also a fine rash covering the hairy surfaces of the forearms and the anterior surfaces of the thighs of a similar nature but not exhibiting marked infiltration or thickening of the skin underlying the diseased areas as that of the face. A peculiar brownish-bronze generalized condition of the skin could not be explained.

A diagnosis was made of an acute dermatitis venenata, the exact origin being undetermined.

The patient was treated ambulantly for about ten days with astringent lotions and protective applications without benefit. On January 24, 1939, the patient was then placed in the hospital where he remained until February 6, 1939. At this time warm packs of astringent lotions, colloid baths, intravenous injections of sodium thiosulphate and calcium thiosulphate were given with very little relief of patient's condition. While in the hospital X-ray treatments were instituted but gave very little relief. In February, 1939, he was referred to the Mayo Clinic at Rochester, Minnesota, where he remained for a period of about six weeks for examination and symptomatic treatment. The tentative diagnosis there was

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that of a moist neuro-dermatitis with seborrheic characteristics.

Upon returning home he was improved with but a few scattered lesions remaining. Within two weeks after returning to his home he developed abrupt signs of a wide-spread recurrence, the sites of predilection being the hairy surfaces with exception of the scalp. There was particular involvement of the beard, thighs and forearms and it was limited at the level on the thighs uncovered by short trousers which the patient wore.

The patient then tried some baths in the sulphur waters at Thermopolis, Wyoming, without relief and other prescriptions were given by several physicians without relief.

It occurred to me that probably his trouble was due to some agent that was rather unusual, inasmuch as he improved on his longer stays away from home and that almost immediately upon returning home, the symptoms again appeared. A trip to his ranch was made and conditions investigated. It occurred to me that we possibly might be dealing with a case of selenium poisoning in the human.

For years it had been known that animals on his ranch and in the nearby territory had suffered from alkali disease. Accordingly samples of urine were obtained from the patient and sent to Dr. A. L. Moxon, chemist of the Experiment Station Chemistry Department, Division of Agriculture of the South Dakota State College. The first sample obtained contained 43 parts per billion of selenium in the urine. The second sample contained 40 parts per billion. This was obtained about a week later, and was fairly good evidence that we were dealing with a case of selenium poisoning.

A biopsy of a skin lesion was made and sent to Dr. E. T. Bell of the University of Minnesota and the report was that it was a simple chronic inflammation characterized by perivascular accumulations of lymphocytes and that there was nothing specific about the lesion on which Dr. Bell could make a diagnosis.

An examination of the skin at this time, July 13, 1939, showed the lesions to be mainly on the hairy surfaces of the arms, legs and the suprapubic regions. The face had a few lesions remaining but these had cleared up fairly well. The acute condition around the eyes was entirely gone. The skin presented a peculiar thick, dry lichenoid appearance and there were many perifollicular pustules from which the hair was easily expressed or pulled out. The hair usually had attached to it the remnants of the follicle together with the pus surrounding it. Not all hairs were involved, but an estimated 30 per cent involvement occurred.

The patient was then placed in the hospital and several more specimens of urine obtained which showed about the same concentration of selenium. Samples of water, soil, meat, garden vegetables and dairy products which the patient was using on his ranch were investigated and a large number of them were found to contain selenium in appreciable quantities. The patient was then instructed to avoid all these things, and this was done. As a result there was some improvement in his condition, but the improvement was not marked.

It had been shown by Moxon and associates[12] that the rate of excretion of selenium from selenized animals could be increased by the administration of bromobenzene. I was advised of this by A. L. Moxon, chemist of the Department of Experiment Station Chemistry, Brookings, South Dakota, in personal communications. He also stated that he had used bromobenzene on dogs and on cattle that had been selenized, and that the bromobenzene appeared to aid the organism in excreting selenium possibly as selenium cystine and selenium methionine which are conjugated with bromobenzene and excreted as a mercapturic acid like compound.

Thus on October 30, 1939, the patient was hospitalized and the administration of bromobenzene was begun on November 4, 1939, after first collecting samples of urine to determine the usual concentration. A small specimen of blood showed no selenium. Bromobenzene was administered to the patient, 3 minims three times daily in capsules. The excretion was as follows: (See fig. 1.)

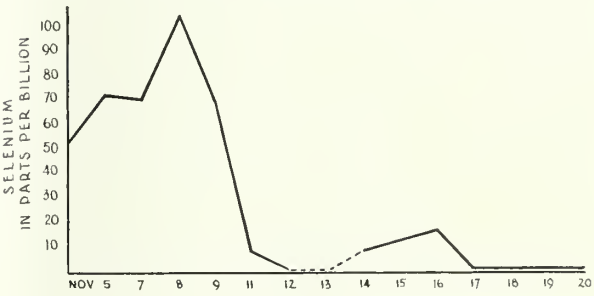

Fig. 1.

It was stated by the chemist that this selenium was in the mercapturic acid fraction of the urine, indicating that it was being eliminated from the body in that manner. These tests were run from October 30 through November 20, 1939. With the administration of bromobenzene, a remarkable thing occurred. Within the first twenty-four hours of the administration, the itching symptoms had almost entirely ceased and the patient was comfortable for the first time in several months. The severe itching which had not been relieved by any other reagent had almost entirely disappeared. By the end of the first 24 hours the lesions could be seen to have markedly subsided in that many pustules had disappeared and those that remained contained very little pus, and the areas between the pustules were less thickened and inflamed.

This condition rapidly improved and by the end of the third day, only a very few pustules were left over the entire areas involved. By the end of the seventh day no pustules remained. The skin had almost resumed a normal appearance, there being a few areas of discoloration of a reddish-brown nature where the last remaining pustules had been located. The skin between these areas was entirely normal. The patient stated that he felt better than he had since the onset of the illness with regard to the entire relief of his symptoms, and had a better appetite and a sense of well-being.

On January 2, 1940, the patient was again given bromobenzene. This time he was given 5 drops three times a day, and the excretion of selenium was as follows: (See fig. 2.)

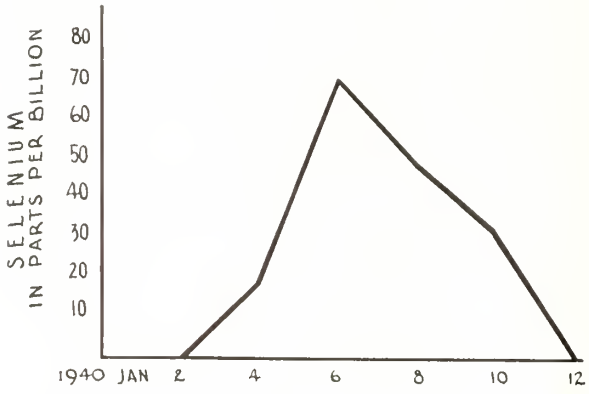

Fig. 2.

This curve shows the increase in excretion of selenium in the selenized organism, with the first few days of bromobenzene administration and also shows the subsequent decrease in selenium excretion, a response also noted in animals. Almost all the selenium in these samples occurred in the mercapturic acid fraction of the urine. Following this response to bromobenzene, urine samples at frequent intervals continued to show no selenium. It was thought then that specific proteins in the body must contain the selenium and that it must be absorbed from other proteins in the body and that only from the specific proteins could it be eliminated by the administration of bromobenzene. Therefore, since that time, once each month, the patient has taken bromobenzene for three days, and the urine has been collected.

For instance, on January 2, 1940, the urine showed no selenium. Bromobenzene was then administered, three drops three times a day for three days. On January 4, the urine showed 20 parts per billion; and on January 6, the urine showed 72 parts per billion. This elimination is typical of each time we administered bromobenzene. Succeeding examinations have shown practically no change in this excretion rate. It would seem then that not all the selenium in the body is available for elimination by bromobenzene at one time and that only a fraction of the selenium in the organism is eliminated by bromobenzene until it is in certain specific combinations. The patient's skin condition has remained entirely clear since the initial administration of bromobenzene. The patient has gained weight, is much more robust in appearance and feels better than he has since the onset of the disease, and, he believes, for several years.

The following are points which I would like to emphasize in connection with selenium poisoning:

Selenium in appreciable quantities is known to exist in North and South Dakota, Nebraska, Wyoming, Montana, Colorado, Kansas, Utah, Nevada, New Mexico, and California.[1,13] It is possible that it may exist in other sections of the United States which have not been recorded. In the above named states, it is shown that selenium has been the cause of toxic symptoms in animals.[1] In animals, selenium affects the liver, producing sclerosis, necrosis and hemochromatosis.[14,15] It also affects the kidneys[14] and, probably, affects both these organs in the human.

It is probable that selenium is more toxic to the human than it is to most animals as the selenium in the blood and urine in this case above reported, is considerably lower than that found in animals in seleniferous areas.[16,17,18] Therefore, it is reasonable to suppose that many of our cases of obscure gastrointestinal disorders as well as some cases of renal damage may be found to be due to this agent.

Since the discovery of this case of selenium dermatitis, several others have come to light. One of the workers in the state laboratory who has been working with selenium for a number of years, complained of tender spots on his face and also a roughness of the skin on his legs. He was markedly benefited when he himself took some bromobenzene. Before the administration of bromobenzene his urine contained 43 parts per billion of selenium. During the excretion his rate went up to 80 parts per billion of selenium, and his skin condition was much improved.

Another very interesting case is that of a female, 28 years, who for years has had a very severe eczematous condition which has been very resistant to treatment. She, so far as she knows, has not been exposed to any form of selenium. Due to the fact that her skin exhibited a dry, wrinkled, lichenoid appearance very similar in nature to the first patient described, together with the similar pustules and intense itching, samples of her urine were analyzed and found to contain appreciable quantities of selenium. After the administration of bromobenzene the excretion rate was raised in similar nature to that of the first mentioned case, together with marked relief of her symptoms and considerable regression of the lesions, although she has had very small quantities of bromobenzene.

At the present writing, four other cases are under observation and investigation.

This disease may be much more common than we think. Many of our chronic eczematous conditions of the skin, which do not respond to the usual treatment, should be investigated from the standpoint of selenium.

Regarding the occurrence of this agent, Smith[8] reports that 90 per cent of a series of human urines examined at random in a known selenium territory showed appreciable quantities of selenium in the urine. Klaus Halter[9] in his exhaustive report of a case of selenium poisoning in a glass worker states that he could not differentiate between eczema caused by selenium and other eczemas.

Bromobenzene has been used with great care to eliminate selenium from the organism in these cases. In suspected cases the provocative elimination test as well as a relief from the symptoms and the regression of the lesions, would seem to be of diagnostic importance.

The human organism may become sensitized to selenium, in a manner similar to that which occurs with arsenic

in the treatment of syphilis, and thus may have considerable quantities of selenium in the system for years before sudden skin manifestations appear.

Individual susceptibility has been tested in animals, and the effect of selenium of reproduction has been studied in animals.[19,20] The problem of photosensitivity should also be investigated. It has been observed that the white areas of black and white selenized hogs are much more tender and lose the hair first when the hogs are allowed to run outside. I have observed that exposure to sunlight always increases the symptoms and the administration of ultraviolet light also increases the symptoms and severity of the disease. Patch tests and scratch tests on normal individuals and on the individual known to have selenium poisoning were tried. Very dilute solutions were used, but the severe corrosive reaction of selenium and its compounds prevented any definite results on these.

Probably selenium is but slowly eliminated from the human organism and the continued ingestion of selenium, even, in very small amounts will produce an accumulative effect.

In conclusion I would like to extend my thanks and give due credit to the members of the Department of Experiment Station Chemistry of the South Dakota State College of Agriculture, at Brookings, whose expert analyses and whose helpful suggestions have made this investigation possible. I am especially grateful to Alvin L. Moxon and Oscar E. Olson.

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Pruritus Vulvae as a Possible Early Symptom of Unrecognized Diabetes*

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THE purpose of this paper is to emphasize the frequency of pruritus vulvae in association with hyperglycemia. Pruritus vulvae, like all other forms of pruritus, should always be considered a symptom and not a disease.

Pruritus vulvae is not only a dermatologic problem; it is often encountered by the internist and the gynecologist. Nevertheless, a patient with pruritus at any site often applies to the dermatologist for relief. Cole[1] stated that in all patients with pruritus a thorough examination is imperative, a fact which was also stressed by Goeckerman[2] who listed eleven essential systemic causes of pruritus.

We would like to point out that diabetes is more often the underlying cause of pruritus vulvae than is generally suspected. Itching of the vulvae is often the first symptom of diabetes or rather of hyperglycemia. A considerable number of patients who do not have any sugar in their urine, on thorough questioning give a history suggestive of diabetes and the blood sugar content may be found elevated.

Pruritus vulvae was well classified etiologically into three main groups by Labhardt:[3]

1. Symptomatic pruritus
   a. in local vulvar disease (vulvitis and maceration due to discharge)
   b. due to constitutional disease (diabetes, hypothyroidism, hyperthyroidism, etc.)
2. Pruritus on an endocrine basis.
3. Neuro and psychogenic pruritus.

On an anatomic basis, pruritus vulvae can be classified clinically into two main groups:

1. Symptomatic pruritus in which there are no anatomical changes.
2. Pruritus associated with anatomic changes in which clinically are seen exzematization, atrophy or hypertrophy. Hypertrophy may be manifested by lichenification and leukoplakia.

The patients discussed in this report belong purely in the group of symptomatic pruritus both etiologically and anatomically.

The mechanism by which diabetes causes pruritus vulvae is not known. There are two main theories. Labhardt[3] explained pruritus vulvae on an endocrine basis entirely; namely, that there is a close connection between the pancreas and the ovary. He believed that diabetic women have an ovarian hypofunction which leads to leukoplakia and the resultant itching. This theory leaves much room for argument, since leukoplakia is not always the primary condition in pruritus vulvae. Like many other observers, we have seen leukoplakia without pruritus and pruritus without leukoplakia. This is in accord with Schlein's[4] belief that the leukoplakia is a secondary condition. Labhardt attempted to support his theory of ovarian hypofunction by von Noorden's[5] observation of sterility and tendency to spontaneous abortion in the diabetic woman. In spite of this rather plausible theory, one cannot as yet accept Labhardt's interpretation from the standpoint of present day knowledge of endocrinology.

Plass, Hesseltine, Campbell and Borts[6,7] believed that pruritus vulvae in diabetics was secondary to a fungus infection, facilitated by the high sugar content of the urine and tissues, which obviously form a satisfactory medium for the organisms. The tissues are inoculated either by the fingers, clothes or the male genitals at sexual intercourse. Castellani[8] discussed the importance of examining a male partner for yeast-like fungi, and of treating him simultaneously in order to obtain satisfactory results and to avoid recurrence.

It is a well known fact that glucose applied externally does not cause itching. Glucose packs applied to the vulva by many investigators have failed to produce a sensation of itching.

This report is based on a study of 31 patients who were admitted to the Minneapolis General Hospital Clinic between January 1, 1939, and August 1, 1940. All complained of pruritus vulvae. Of these, 26 were diabetics. Eleven of the 26 were known diabetics and the remaining 15 were discovered to be such after complete investigation. A few typical case histories illustrate our points.

Case Reports

Case 1. A white female, 32 years, married, normal catamenia, nullipara, had severe pruritus vulvae since July, 1939. At this time she consulted a physician who ordered vaginal douches with mercurochrome and later with Burow's solution. The patient obtained no relief. A second physician was consulted who prescribed calamine lotion. She had become so nervous that she threatened to commit suicide and she was finally admitted to the neuropsychiatric service on February 8, 1940. A routine urinalysis showed a four plus sugar (Benedict qualitative) on one occasion, but was negative when repeated two days later. She then received three X-ray treatments of 75 roentgens each, unfiltered, and was discharged February 21, 1940, although she stated that she had no relief of the itching.

A history of polyuria, polyphagia and polydypsia was obtained and she was readmitted to the hospital. A urinalysis revealed faint traces of sugar (Benedict qualitative). The blood sugar determination done at this stage was 235 milligrams per cent. Since the patient's weight was 169 pounds, she was put on an 800 calorie diet. Her blood sugar came down to 120 milligrams per cent after six days of dieting. She lost ten pounds in weight within three weeks and her itching disappeared completely after the sixth day. She is now on a diet of 60 grams

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of protein, 100 grams of fat and 100 grams of carbohydrate. A smear from the vagina revealed yeast-like fungi for which she received 1 per cent resorcin packs. Her smears for fungi were negative after six days of diet and local applications. She is still under observation and entirely symptom-free.

Case 2. A white female, 49 years, weight 160 pounds, married, nullipara, normal catamenia, came to out-patient skin clinic on January 20, 1940, complaining of severe vulvar itching. The condition had been present for five months and had gradually increased in severity. She had previously consulted three physicians at different times who had prescribed wet applications and X-ray therapy. The last of these physicians examined her urine and found no sugar.

On examination of her urine in the hospital laboratory, normal urine content was reported. The blood sugar was 155 milligrams per cent. The sugar tolerance test revealed 133 milligrams per cent after one hour; 205 milligrams per cent after two hours; 270 milligrams per cent after three hours; 286 milligrams per cent after four hours; 308 milligrams per cent after five hours; 180 milligrams per cent after five and one-half hours; and 150 milligrams per cent after six hours.

Vaginal smears were negative for fungus. She was put on a diet of 60 grams of protein, 100 grams of fat and 100 grams of carbohydrate. Her pruritus disappeared after five days of this regime and she has been symptom-free since.

Case 3. A white female, 43 years, weight 162 pounds, married, mother of two children, was seen in the hospital on consultation with the gynecology department, April 19, 1940. She complained of severe vulvar itching of one year's duration. She had previously consulted four physicians and was treated with X-ray and wet packs. One physician had advised vulvectomy and another had advised psychiatric consultation. She also was treated with theelin injections, intramuscularly, and local painting with 5 per cent aqueous gentian violet. Since yeast-like fungi were found in the vaginal smear after six days painting with gentian violet and no relief obtained from the itching, dermatological consultation was sought. The urinalysis for sugar was repeatedly negative.

On detailed questioning, a fair history for diabetes was obtained.

The glucose tolerance test was 108 milligrams per cent fasting; 285 milligrams per cent after one-half hour; 343 milligrams per cent after one hour; 340 milligrams per cent after two hours and 275 milligrams per cent after three hours.

She was placed on a diet of 60 grams of protein, 100 grams of fat and 100 grams of carbohydrate. Locally, 1 per cent aqueous resorcin packs were applied. She became and remained entirely symptom-free after the fifth day, at which time her blood sugar was 98 milligrams per cent.

Case 4. A white female, 39 years, weight 152 pounds, married, nullipara, came to the out-patient department on February 7, 1940, complaining of severe itching of ten months duration. She had previously been treated by douches, packs, X-ray and cauterization of a spot of leukoplakia. On two different examinations in the gynecological out-patient department, a positive smear for yeast-like fungi was found and she was treated with 5 per cent aqueous gentian violet and 1 per cent resorcin packs intermittently without any relief.

The urinalysis in the dermatologic out-patient department was negative for sugar. The blood sugar was 150 milligrams per cent. The sugar tolerance test was 155 milligrams per cent fasting; 279 milligrams per cent after one-half hour; 348 milligrams per cent after one hour; 339 milligrams per cent after two hours; 243 milligrams per cent after three hours; and 202 milligrams per cent after four hours.

She was admitted to the hospital February 5, 1940, and placed on a diet of 60 grams of protein, 100 grams of fat and 100 grams of carbohydrate; her blood sugar returned to within normal limits in four days. She was entirely symptom-free after the seventh day and was discharged on February 16, 1940. One month later she returned complaining of a slight recurrence of itching. Her blood sugar at this time was 135 milligrams per cent and yeast-like fungi were found in a vaginal smear. Her husband was examined and found to have yeast-like fungi on a smear from his prepuce. He was instructed to use 1 per cent resorcin packs and to exercise diligent hygiene of the genitals. She was again instructed regarding her diet and 1 per cent aqueous resorcin packs were advised for a few days. When last seen, on August 1, 1940, her blood sugar was 105 milligrams per cent and she was entirely symptom-free.

The histories of the fifteen patients who were not known to have diabetes showed that they were each seen by from two to five physicians. The patients' ages ranged between 30 and 50 years of age. All were married and parous women were as numerous as nulliparous women. All of these patients on specific questioning gave histories of polyphagia, polydypsia and polyuria. The duration of itching varied from three to fourteen months before the diagnosis of diabetes had been made. Several of these patients were under psychiatric treatment without avail and were considered for institutionalization. One patient had been scheduled for a vulvectomy which was found unnecessary subsequently. All patients had had negative urine sugar examinations on two or more occasions and the urine was free of sugar at the time of admission to the hospital. Fungi were found in eight of ten patients thus examined. In those patients where fungi were found local therapy alone did not give relief. One patient with fungi was resistant to treatment until her husband was treated simultaneously.

The fasting blood sugar content in all of these patients was either at the upper limit or above normal; one being 235 milligrams per cent of blood. The sugar tolerance test in all showed a marked tendency of the blood sugar to remain elevated far above normal from three to six hours after the ingestion of the glucose. All of the patients responded to treatment only after their diet was regulated and the blood sugar reduced to normal. Two patients required insulin in addition to the low carbohydrate diet before the blood sugar could be reduced to within normal limits.

Discussion

As can be seen from the preceding collective case reports, the presence of yeast-like fungi was not a constant finding. In many instances fungi can be found in the vulvae of persons with diabetes, but they are frequently found in persons without diabetes. Furthermore, there are patients who have diabetes with pruritus in whom no fungi are present. We are unable to agree with Hesseltine and Campbell regarding the response to fungicidal therapy alone, in that it is not always successful. A combination of local and systemic therapy is sometimes necessary where the fungus is found.

In cases of diabetes with pruritus vulvae, it appears that diabetes, running its course uncontrolled is conducive to reinfection by the yeast-like fungus. The importance of treating the male partner should be noted in preventing reinfection. The treatment should of necessity be carried out on the male partner at the same time that the female is being treated.

In our series of patients, we could find no history of menstrual irregularity.

From a close study of our patients' histories, it is evident that pruritus vulvae may be the first symptom of diabetes, even preceding the classical triad of polyphagia, polydypsia and polyuria. Even though one may think of diabetes as the cause of pruritus vulvae, he is usually

satisfied with one or two negative urinalyses. Thus he overlooks the fact that the blood sugar concentration and its resultant renal spillage varies in the course of twenty-four hours. Furthermore, there are patients with high renal sugar thresholds. The diagnosis of diabetes mellitus requires more than a positive finding of sugar in the urine. However, a negative test for sugar in the urine does not rule out diabetes mellitus. The elevated blood sugar is the essential criterion for the diagnosis of diabetes mellitus.

Kobacker,[9] in his discussion of Hailey and Hailey's paper, mentioned the fact that he had seen several patients in whom a diagnosis of diabetes was not made until a blood sugar was done. One of his patients who did not have a glycosuria, had a blood sugar of 240-250 milligrams per cent. He also stated that some patients who have no glycosuria need large amounts of insulin to control their blood sugar properly.

Summary

Diabetes was the cause of pruritus in 26 of the 31 consecutive patients with pruritus vulvae.

Of the twenty-six patients with diabetes, fifteen were not recognized as such because the urinalyses at the time of examination were negative.

In addition to a blood sugar determination, the sugar tolerance test was useful in verification of the diagnosis of diabetes.

When yeast-like fungi were found associated with diabetes, fungicidal therapy alone was insufficient.

Conclusions

1. Pruritus vulvae is often the first symptom of diabetes.

2. All pruritus vulvae patients should have detailed histories for diabetes, a twenty-four hour urine examination and blood sugar determination. In doubtful cases, the sugar tolerance test is absolutely necessary for verification of the diagnosis.

3. In pruritus vulvae of diabetes, complicated by yeast-like fungus infection, local treatment, systemic treatment and simultaneous treatment of the male partner are necessary.

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A New Type of Obstetrical Forceps

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OBSTETRICAL forceps were first introduced by the Chamberlen family in 1584. Leverett and Smellie independently devised and added the pelvic curve to the straight Chamberlen forceps. After that, no improvement was made for over two centuries until Tarnier brought forth his principle of axis traction in 1877. No essential further modification of the basic principle was devised until 1915 when Kielland reported the use of a new model of forceps which he had employed since 1908. The chief advantage of the Kielland forceps over others was the slight pelvic curve. Another prominent modification was the sliding lock which made a correct cephalic application much easier and more certain than with those having a pelvic curve and a fixed lock.

From the time of their first introduction in 1584, obstetrical forceps have increased constantly in usefulness. In fact, in 1931, at the White House conference, Plass[1] reported that in a series of 148,812 obstetrical cases, forceps were used in 17.9 per cent. Surely, this is adequate cause for continued study to improve all known methods of forceps usage and construction.

From using forceps and an analysis of the faults and disadvantages of forceps now in use, certain features of them seem amenable to improvement. For instance, obstetrical forceps, when properly used, are supposed to replace or aid the force of the naturally occurring uterine contractions. This is accomplished by traction on the forceps and through them to the head of the child. But when traction is made, the forceps blades exert pressure on the child's head to hold it firmly.

The primary difficulty has been that there is no chance for the head to rotate due to the tight grip which the operator maintains on the rigid forceps handles. When traction is applied, the harder the operator pulls on the forceps, the harder he grips the handles. In doing so,

he loses the sensation of the head within the blades because his hand is not sensitive enough to perceive the tendency of the head to rotate, flex or extend within the blades. Were he able to sense this tendency, he would be able to revolve the head to the larger and more favorable position within the pelvis.

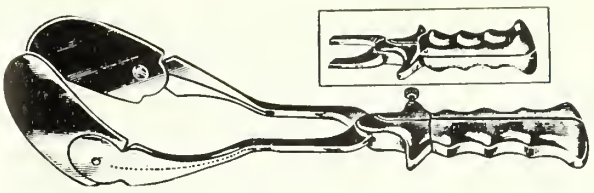
With all forceps now in use, it follows that the cervical portion of the child's vertebral column may be unduly strained in a difficult delivery. Since the head must make its descent through the generative canal by dilating it, the forceps contact the soft portions of the birth canal in a manner and degree entirely different than the simple dilation of these parts would require. In other words, descent of the head with forceps applied can scarcely be compared with the work of expansion which uterine contraction and natural dilation bring about. With presently used forceps, resistance is increased by the highly unfavorable stiff bond between the hand of the physician and the head of the child.

Often, conditions favor delivery of the head in the occiput posterior position. Caldwell[2] and his colleagues, and Titus[3] contend that delivery in the occiput posterior position is advisable in both the android and anthrapoid types of female pelves. The first mentioned group found such pelves in 23.2 per cent of 215 consecutive prima-gravida cases. In such pelves, compensatory space exists in the posterior pelvis, as a result of which the occiput should be rotated to the posterior position. It is mechanically wrong to attempt the rotation of the fetal head from a wide diameter through a narrow one. The same principle obtains in delivering the aftercoming head in a version and breech extraction. Therefore, it is logical to rotate the head to an occiput posterior position in the inlet itself, if this is possible, in order to deliver the head in the same position.

Under certain obstetrical conditions, it is necessary to rotate the child's head through 180 degrees. One of the marked disadvantages of the forceps now in use is the fact that under such conditions many re-applications of the forceps are necessary. For example, De Lee,[4] using his own modification of the Simpson forceps, makes four different applications to rotate the head 180 degrees. Vedder[5] using the Kielland forceps, rotates the head only three to five degrees with each application of the forceps, thus applying them from 30 to 60 times to accomplish 180 degrees of rotation. Each application increases the likelihood of puerperal infection.

To overcome these faults and disadvantages of previously designed obstetrical forceps, the author has devised a new model of forceps. It resembles De Lee's modification of the Simpson forceps. It is as easily applied as the Simpson instrument, and the blades being thinner, occupy less space in the birth canal. The possibility of free rotation, flexion and extension of the head, as well as the insertion of an elastic mechanism for the purpose of overcoming the friction of the head, is the goal sought.

This forceps may well be considered as new in both principle and design. The swivel, or ball joint, bilaterally frees the head from any hindrance traceable to rotation, flexion or extension due to the pull of the operator. The



A new obstetrical forceps.

head can gradually and fully turn automatically to conform with the diameters of the birth canal in spite of the direction of the pull exerted upon it. Rotation of the head is due to pressure of the soft portions of the pelvis, especially posteriorly. Rotation is, then, nature's attempt to adjust the fetal head to the compensatory space in the pelvis. It is possible to prevent any hindrance to the free rotation, flexion or extension of the head by the use of the new forceps. Thus, the forceps enables the replacement or substitution of natural labor forces by a forceps operation made to conform as closely as possible with natural conditions.

Among the outstanding advantages of the new forceps is the fact that it is especially adapted to manipulate one of the abnormal positions, the occiput posterior position to the occiput anterior position, or vice versa, when indicated. This is accomplished by rotating the head 180 degrees, if necessary, with but one application. While this rotating movement is in progress, the blades automatically turn themselves to accommodate to the new pelvic position and to the pelvic curve. Delivery can be completed without changing the first application or removing the forceps. The danger of infection and trauma is thus minimized.

A lock is provided in the shanks to hold the blades in a fixed position. This can be released by the operator after application of the forceps, thus allowing automatic, free movement of the blades and the head during rotation and delivery.

The new blades are designed to fit the head, and, consequently, all curves are cephalic curves. The blades automatically adjust themselves to the pelvic curve when necessary. This contingency is provided for by the joint near the center of the blades. This joint assists the blades automatically to adjust themselves to the pelvic curve during the movement of rotating the head from occiput posterior to occiput anterior position for delivery.

The advantages of the new forceps are: (1) It is more easily applied than the Simpson forceps because the blades are thinner. (2) When in place and locked, as traction is applied, the head can be free to flex, extend or rotate to follow easily through the birth canal. (3) Movement of the head along the longitudinal axis of the generative canal is facilitated by its use. (4) It reduces the pressure of the blades to a minimum and equalizes the distribution of pressure in all parts of the birth canal during traction. (5) The stiff bond between the head of the child and the hand of the physician is eliminated because the head can extend, flex or rotate as the pelvic curvatures require. (6) It is simply constructed for safe manipulation and asepsis, but possesses axis traction features. (7) One application only is re-

quired to rotate the head from an occiput posterior position to an occiput anterior presentation, or vice versa, thus eliminating likelihood of infection and trauma to mother and child. (8) The thumb screw on the right handle allows the operator to open or close the blades for a larger or smaller head. (10) The blades can be locked on the head by turning the outer handle right or left one quarter turn. (11) The forceps blades can be locked in any desired pelvic curve before or during the application of the forceps. The locks can easily be released at the will of the operator after application.

During the period of study and designing of the forceps, the author was helped by many authorities who graciously devoted time and suggestions to the problem. After the forceps was available, many obstetricians accepted it for trial. For these and many other courtesies the author feels indebted and grateful to the following: Doctors Paul Titus, N. J. Eastman, John W. Harris, A. H. Lahmann, H. H. Cummings, J. B. De Lee, William Dieckmann, Fred L. Adair, R. M. Grier, William E. Caldwell, H. C. Maloy, Hugh J. Tunstead, A. B. Hunt and R. N. Mussey.

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A New University Health Service Building

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SELDOM oftener than once in a generation is a college or university department concerned with a major development of physical plant and equipment. The Health Service of the University of Michigan has been so concerned for the past year and a half. A completely new building designed for its use will soon be finished and supplied with much new equipment.

The gradual growth of such departments over 25 years has usually been marked by annual reports of building and equipment limitations so distressing that the prospect of a new building brings expressions of joy unconfined. In our experience this orgy of joy soon developed into a phase characterized by unforeseen headaches. In the rapid development of plans we experienced something of the old discrepancy between anticipation and realization. Many problems arise when one becomes responsible for deciding just how the present and future health of 12,000 annually enrolled students may best be served by placing into solid concrete upwards of $400,000.00. This is particularly true under the rush of a P.W.A. project suddenly made possible.

Whether the building should provide for the program which has just grown up or whether it should be built to provide for uncertain anticipated and possibly radical changes of program is, of course, the major problem. It would be fortunate if as a result of such an experience one could formulate basic principles to be used by others in developing a similar building. Desirable as this seems, however, one sees no such clearly defined laws to be followed. Hospital buildings are quite well standardized, but architects have little experience with plans for a College Health Service Building.

Our plans developed much upon the principle of giving more adequate space for the program and activities already established, and one hopes that the walls will develop a large degree of flexibility to provide for future development. If Health Centers develop to provide clinical service to units of typical populations in society, buildings such as we have may be useful as bases for planning such centers. In constructing a building in a large university, there are naturally many persons to be consulted. In our project, purely clinical aspects were difficult to displace by what may be characterized as educational features. A class lecture room was retained, however, in which members of the staff will conduct both formal and informal instruction, and some space is available for educational exhibits.

The new plant will be occupied before the end of this college year and we all anticipate work in it with full realization of the advantages which it should afford. We hope, also, that the successes and failures in our plans, which Father Time is quite certain to point out, may become helpful to others in planning similar buildings. It will be a pleasure to receive visitors at any time. The building is expected to provide adequately for a very generous program of clinical medical service for at least 12,000 resident students. Certain attention to faculty members and university employees may be added. The students, who are about one-third women, are with few exceptions away from home. The use of the facilities of the large hospital connected with the medical school will continue for major surgery, extra bed capacity, and less frequent highly specialized refer services. Recent average daily outpatient visits amount to 570 and annual regular session bed patient admissions have been 217 per 1,000 students enrolled. The number of bed patient days per admission have averaged five. Little provision is made elsewhere on the campus to give any atten-

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Fig. 1.

Fig. 2.

tion to student illness, although some student nursing service is available in dormitories for women without special facilities. Laboratory service by the department is very largely clinical.

Present plans are uncertain as to the use of the new building for the medical examination of all new students during one week in the fall. This has been done in the nearby large gymnasia.

Building Evolution

The department was started in 1913 with a small residence building converted into three physicians' offices, a record office, a waiting room, and a laboratory.

In 1921 a larger and more modern building providing for growth to date included a thirty bed infirmary and many over-crowded offices and laboratories.

The new building faces the west, is semi-modern in design, about 200 feet long, 50 feet wide with a rear wing, and has four stories. It is well located with relation to central campus and related buildings.

Revolving doors are omitted from the front entrance as an economy. For the same reason acoustical ceilings are limited and air conditioning is not included in any part. Ventilation is provided by negative pressure exhaust ducts widely distributed. Paging will depend upon a simple buzzer system operated from the telephone switchboard. Front and rear door buttons will signal the infirmary floor for night service.

While the new building provides three times the space now occupied by the department, we anticipate that it will soon appear to be well filled. A later street development will make possible a curved driveway to the main entrance.

Fig. 3.

Full story natural illumination is provided from the rear. Several considerations have justified considerable space for the manufacture of pharmaceutical preparations and allergens. Twenty years of inactive student records will be easily available in Room 5 by means of the spiral stair. Because of university storehouses elsewhere, supply storage will be reduced to a minimum on indicated racks. The statistical laboratory will group all records of routine and research tabulations and provide space for future development. Two stairways extend to the third floor and the central one to the fourth. Room 24 is unassigned, and a cover extends over the ambulance and delivery entrance.

Ground Floor

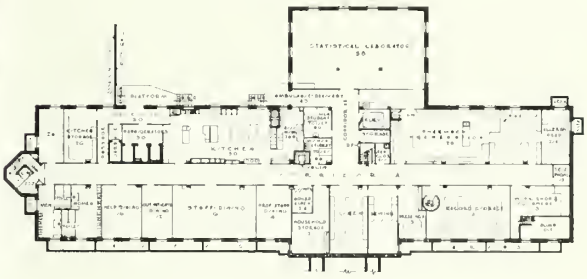

Fig. 4.

Ambulatory students will obtain and carry their records from a counter at the right of the lobby to the respective waiting rooms on the first and second floors. Eleven general physicians' offices, each with one large or two small examination rooms, surround two waiting rooms in the north wing. Rooms 110 to 120 in this section will be used by three women physicians. Doors from examination rooms next to these waiting rooms permit of only one way traffic, out. Little use is to be made of the outside door in the end stair well. The dispensary nurse unit will provide for many direct services. The lecture room will seat classes of eighty and provide for possible later use otherwise. Prescriptions will be filled on this floor, Room 127 is unassigned, and the staff room will contain a small library. All telephone calls will be handled by a private board exchange located at the records counter (103).

FIRST FLOOR

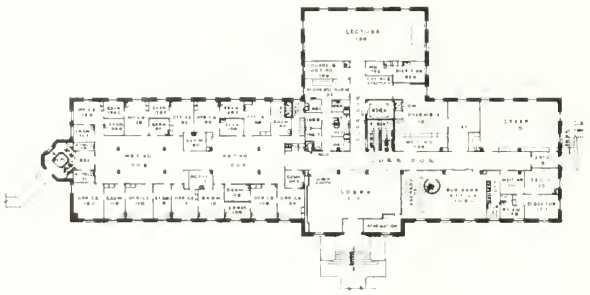

Fig. 5.

This floor provides for special services, some of which are most accessible to the general physicians by way of the end stairs. The space 228A, adjacent to the laboratory waiting room, is for taking blood specimens, and the two toilets at the other end permit patients to leave urine specimens in a revolving cabinet which delivers

SECOND FLOOR

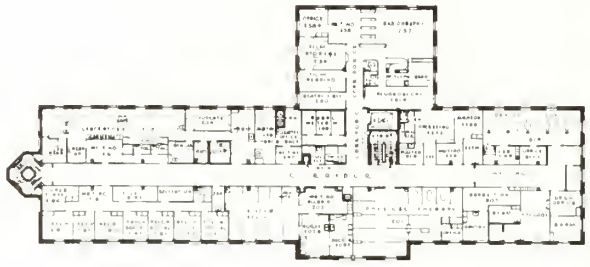

Fig. 6.

them to the analysis bench in Room 228. The basal metabolism booths are provided with special sound protection.

One answer to the prayer of the X-ray man for a square floor plan removed from the basement is given. Dental X-ray and X-ray therapy will not be done in the building for the present. Four dressing booths are between the waiting and main radiographic rooms and the fluoroscopic room will be used as a secondary radiographic room. Transformer space is provided in a balcony over the maize end of the dark room.

Operations will be confined to those done under local anesthesia, mainly nose and throat, and the surgeon supervises physical therapy. Dental repair service is limited to the simplest type of fillings in cases which seem most urgent. The otology examining room is sound-resistant. Booths in the allergy unit provide for scratch and intradermal tests.

THIRD FLOOR

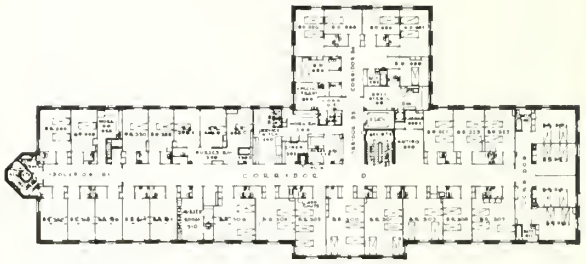

Fig. 7.

The regular 60 bed capacity is all on this floor and capable of some expansion. There are 15 single, 11 double, 5 three bed, and 2 four bed rooms. Each room has lockers and a complete utility room without bath. Five combination shower and tub baths and one shower only are available from corridors. The north end provides for isolation service and three rooms are arranged for mentally disturbed patients. Food service is by trays set up in the kitchen and raised by two electric lifts.

The treatment room, 352, has a special douche table and laboratory test provisions. Room 351 also provides for the treatment of bed patients. Space did not make a lounge room available on this floor, but Room 300, for example, may be so used at times. Portable telephone service is available in the rooms generally and a modern communication system exists between each room and the nurses central station. Visiting parents will find comfortable accommodations at the Michigan League building across the street.

FOURTH FLOOR

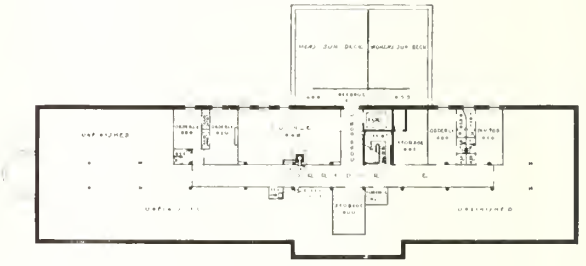

Fig. 8.

This floor, including the sun decks, is to be entirely unfinished for the present. It provides for a patient lounge and living quarters in the building. Pipes are in the walls for the possible distribution of distilled water from this floor.

Are Track Stars Barrel-Chested?*

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I HAVE often read sports writers' references to certain great track and field stars as "barrel-chested" or "deep-chested". These descriptions may have been correct in those particular instances, but I have felt that because those athletes had well-developed chests, they may have *appeared* barrel-chested or deep-chested, when in reality they were flat-chested.

In June, 1940, the National Collegiate Athletic Association track and field meet was held in Minneapolis. National champions and a number of stars from all over the United States participated. I made chest measurements on several of these athletes and compared them with those taken on University of Minnesota male students which I had used as normal male adults in a previous study. Were the athletes predominantly deep-chested or barrel-chested, or were they flat-chested?

Before presenting my findings on these, I should like to show briefly what I mean by "deep" chests and by "flat" chests.

For many years I have been interested in the shape of the chests of normal and tuberculous individuals.[1] When I made measurements of the chest diameters of more than 22,000 children and adults, I found that the normal, healthy adult chest was flat and wide, whereas the average chest of the tuberculous adult was deep and narrow.

The average thoracic index, which is the ratio of the depth of the chest to the width at the nipple line, for the normal adult was .670, or 67 per cent, while the average thoracic index found in a large group of tuberculous male patients was .770, or 77 per cent. In other words, a tuberculous chest was found to be about 15 per cent deeper than an average normal chest. Fig. 1.

The tuberculous chest looks flat because the tuberculous individual as a rule stands with drooped shoulders, allowing the chest to sink in. If this person straightens up, his chest is found to be in reality deep and round.

In the process of chest development, I found that the chest of a new born baby is almost round. Shortly after birth it begins to flatten out quite rapidly, so that by the end of the first year the thoracic index is down to .780 (78 per cent). By the end of the fifth year, the thoracic index is .720 (72 per cent). The chest then flattens out more slowly until it reaches its mature form at about the age of puberty, having then an index of about .670 (67 per cent). The process thus described is normal chest development. Fig. 2.

Disease in infancy, such as upper respiratory infections, whooping cough, rickets, and gastro-intestinal diseases, interferes with proper flattening out or proper development of the chest. The result is that the deep, infantile-shaped chest is carried on into adult life. This type of chest has a lower vital capacity than a normal, fully-developed, flat chest. It is this type of chest that I found predominantly present in tuberculous individuals.

*From the department of medicine, University of Minnesota, and from Glen Lake Sanatorium, Oak Terrace, Minnesota.

TABLE I.
Thoracic Index Range

Thoracic Index	Number of Cases	Thoracic Index	Number of Cases
586	1	696	3
603	1	698	3 C
620	2	700	3
625	1	703	2
629	2	709	1
638	2	710	1
643	5 2C	714	4
644	2	718	1
648	4 1C	720	2
650	3	721	1
654	1	724	1
655	3	725	1
660	4 1C	727	1
661	5	729	1 C
667	8 1C	730	1
672	2	733	1
673	2	734	1 C
677	1	740	2 1C
678	1	746	1
679	4	750	1
681	1	754	1 C
685	1	769	1
688	1 C	771	1
691	4	772	1
695	1		
		Total	98

(C = colored)

The conclusions reached from the above study were, in brief, as follows:

1. The average normal healthy chest is flat and wide.
2. The average tuberculous chest is deep and narrow.
3. The deep chest is an undeveloped, infantile, immature type of chest, one that is perhaps more susceptible than the normal chest to tuberculosis.
4. The flat chest has a greater vital capacity than the deep chest. The present study consists of chest measurements made on ninety-eight track and field stars. Of course no definite conclusions can be made from so small a number, but the findings are interesting. The thoracic indices ranged from .586 to .772 (table I). The mean thoracic index was .677. This thoracic index is very similar to that which I found in average male university students.

Seventy-one per cent of the athletes had a thoracic index not over .700 (70 per cent). Only 5 per cent had a definitely deep type of chest, with a thoracic index of .750 (75 per cent) or over. There were eleven colored boys in the group, and they had, on the average, a slightly deeper chest than the whites. The mean thoracic index for the white athletes was .673, and for the colored boys, .688. The chest in the negro is, on the average, deeper than in the average white person.

The athletes were classified according to the particular events in which they participated, and the mean thoracic index for each group was determined, in order to see if there was any difference in the thoracic indices of the various groups.

TABLE II.
Mean Thoracic Index in Groups

Event	Mean Thoracic Index	Number of Cases
1. 440 Yard Dash	654	11
2. Pole Vault	660	6
3. Broad Jump	661	5
4. High Jump	667	7
5. 100-200 Yard Dash	667	13
6. Two Mile Run	678	4
7. Hurdlers	679	17
8. 880 Yard Dash	688	14
9. Discus	689	6
10. Javelin	696	9
11. Shot Put	700	6
		98

Mean Thoracic Index for 98 cases = 677.
71% had a thoracic index not over 700.
93% had a thoracic index below 750.
Only 5% had a thoracic index of 750 and over.
Mean Thoracic Index for whites = 673.
Mean Thoracic Index for colored = 688.

The boys participating in track had, on the average, flatter chests than those who participated in weight-throwing, javelin-throwing, or shot-put. The flattest-chested group were the 440-yard dash participants. Their mean thoracic index was .654. The deepest chests were found in the shot-put group, whose mean thoracic index was .700 (table II).

Following is a list of some of the stars in the various events, their places in the events, and their thoracic indices:

Name	*Place*	*Thoracic Index*
220 YARD DASH		
Norwood Ewell—Penn State	1st	.734
Billy Brown—Louisiana State	2nd	.679
Mickey Anderson—So. California	3rd	.667
100 YARD DASH		
Norwood Ewell—Penn State	1st	.734
Clyde Jeffrey—Stanford	2nd	.661
Billy Brown—Louisiana State	3rd	.679
120 YARD HIGH HURDLES		
Fred Wolcott Rice	2nd	.677
Boyce Gatewood—Texas	3rd	.638
440 YARD DASH		
Lee Orr—Washington State	1st	.727
Howard Upton—So. California	3rd	.643
880 YARD RUN		
Campbell Kane—Indiana	1st	.661
Ed Burrows—Princeton	2nd	.691
Paul Moore—Stanford	3rd	.667
MILE RUN		
Louis Zamperini—So. California	3rd	.685
SHOT PUT		
Stanley Anderson—Stanford	2nd	.721
POLE VAULT		
Kenneth Dills—So. California	1st	.655
Geo. Hoffman—Fresno	2nd (tied)	.696
DISCUS		
Archie Anderson—Indiana	1st	.667
Jack Hughes—Texas	2nd	.746

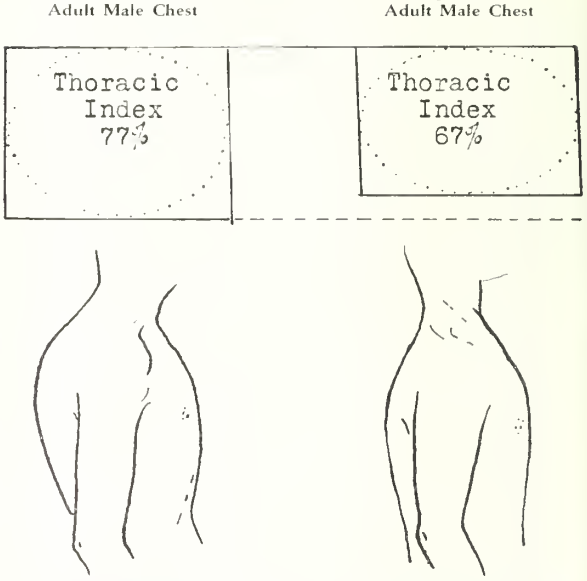


Fig. 1.—Diagram of cross-sections of tuberculous and normal chests. (Your Chest Should Be Flat, S. A. Weisman, M.D., J. B. Lippincott Co., Philadelphia, 1938.)

Diagrammatic Sketches Showing Changes in Chest Contour from Fetal Life Through Adult Age

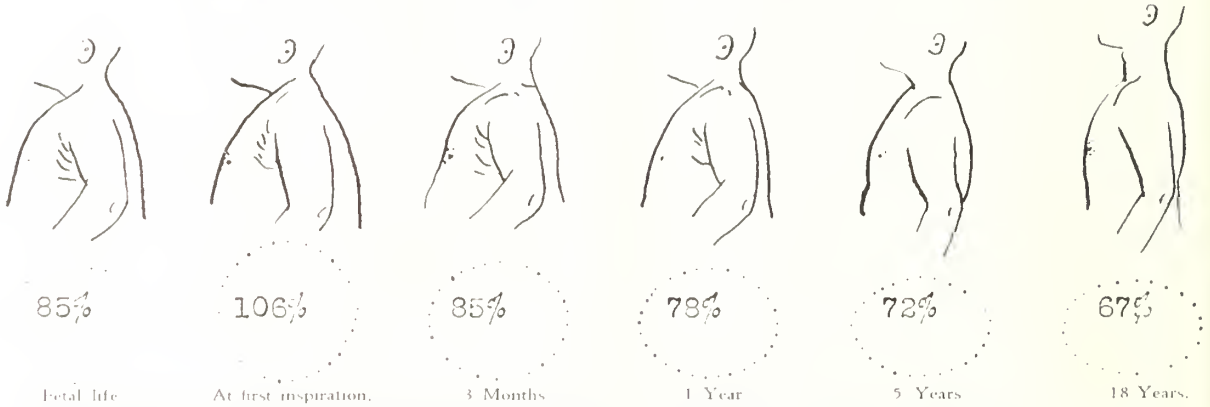


Fig. 2.—Diagram of typical chest diameters, fetal to adult life. (Your Chest Should Be Flat, S. A. Weisman, M.D., J. B. Lippincott Co., Philadelphia, 1938.) Note that there is only 5% difference in the chest contour between the ages of 5 and 18.

Thoracic Index .677

FRED WOLCOTT, Rice Institute
(High Hurdles, Low Hurdles)

TABLE III.
Thoracic Index of 24 Boys That Placed 1st, 2nd, or 3rd

Track (12)	Field (12)
638	603
643	643
661	644
661	655
667	661
667	667
mean = 672	mean = 682
677	691
679	696
685	703
691	714
727	721
734	746

BROAD JUMP

Jack Robinson—U. C. L. A.	1st	.643
Welles Hodgson—Minnesota	3rd	.714

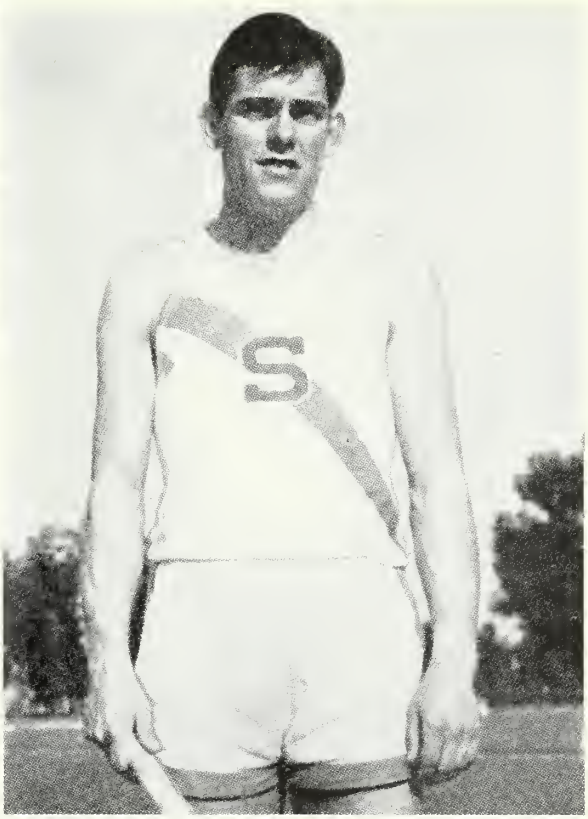
JAVELIN

Martin Biles—California	1st	.603
Herbert Grote—Nebraska	2nd	.703
Boyd Brown—U. of Oregon	3rd	.644

HIGH JUMP

John Wilson—U. S. C.	1st (tied)	.661
Don Canham—Michigan	1st (tied)	.691

Of twenty-four athletes who placed first, second, or third in the various events, eighteen had flat chests (table III). There were twelve track men and twelve field men, the mean thoracic index for the former being .672 and for the latter .682. Among them were such great stars as Clyde Jeffery of Stanford, Billy Brown of Louisiana State, Fred Wolcott of Rice, Campbell Kane of Indiana, Ed Burrows of Princeton, and Louis Zamperini of Southern California. There were only six winners whose thoracic index was over .700. Not one had a thoracic index of .750 or over, which I consider definitely in the deep-chested class. Of the six whose thoracic index was over .700, two were track men and four were field men.



Thoracic Index .661

CLYDE JEFFREY, Stanford University
(220-yard Dash)

SUMMARY

The mean thoracic index in a group of collegiate track and field stars is about the same as that found in the average male university student.

As a group, track men have a flatter type of chest than discus-throwers, javelin-throwers, and shot-putters.

As in the general population, the colored boys have deeper chests than the white boys.

This study indicates, that with few exceptions, track men have flat chests.

REFERENCE

1. Weisman, S. A.: Your Chest Should Be Flat. Philadelphia: J. B. Lippincott Company, 1938.

Contribution of the Physical and Health Education Teacher to the Guidance Program*

Ruth Strang, Ph.D.†
New York City

VERY important aspects of this problem have already been discussed in these meetings — the relation of student health service to college guidance program, in Dr. Fairbank's Section, by Dr. Collings, Dean Allyn, and Dr. Smith; the relationships of physical educator and physician by Dr. Smiley; the place of the physical education teacher as a health counselor by Dr. Kirkpatrick; and opportunities for mental-emotional health guidance in restricted and remedial activities by Mr. Stafford. It is obvious that the program this year is permeated with the personnel point of view and reflects the widespread interest on the part of physical and health educators in the individual development and guidance of students.

In view of these excellent previous discussions, it will be necessary for us now only to review the task of guidance and the total program in order to see more clearly the place of the physical and health education teachers in it.

The Central Task of Guidance

The central task of education is the best development of every individual, including, of course, the social development which is necessary for the most effective living in a coöperative society. This aim is accomplished through providing an environment conducive to the best development of every individual; guiding and stimulating his growth in that environment; helping him to acquire essential knowledge, skills, habits, interests and attitudes of mind; and helping him to set for himself and to work toward appropriate goals and objectives.

In this task guidance is involved in making available to students the experiences, information, and counsel they need. The guidance worker will use all available resources of the college and the community for this purpose. Guidance may be direct or indirect. Counseling, which is one of the most important tools of guidance, is always personal. It is a face-to-face relationship of mutual benefit to the persons concerned. Usually this personal contact is between a more mature and experienced person with a less mature and experienced person.

Contribution of the College Staff to the Guidance of Students

Fortunately, the entire responsibility for the development and guidance of individual students does not rest in its entirety upon the shoulders of teachers of physical education and hygiene. Every member of the college staff should make a significant contribution to the student personnel program.

The administrator is responsible for creating conditions that make effective guidance possible—physical environment, curriculum, and policies governing admission, instruction, and graduation. He also has the important task of selecting new members of the faculty and of providing suitable in-service education for them with respect to their guidance functions.

The specialist—physician, nurse, psychologist, psychiatrist, counselor, placement officer, and others—has three major responsibilities: to deal with complex student problems in the area of his specialty, to supply information about all students to those who will use this information for the good of the students, and to work with and through the faculty, gradually imparting to them some of the more specialized methods and knowledge of work with individuals and groups.

The "generalist"—dean of women, dean of men, personnel director, or similar officer called by various names —performs an important coördinating service in large institutions. At the University of Minnesota, for example, Dr. Williamson is designated as coördinator of more than a dozen personnel services that have developed over a period of years to meet students' needs. He works with committees of deans of schools, specialists, and faculty members to prevent duplication of effort and to make available to the individual student the services he needs. In smaller institutions where few specialists are employed, the dean of women and dean of men perform many specialized services in addition to their coördinating function.

The faculty member may make the most significant contribution of all to the student personnel program because he is in closer daily contact with students than the specialist and can give guidance in their on-going daily activities. This is often the most effective kind of guidance. The physical education teacher is especially fortunate in the informal nature of his classes and in the many opportunities for personal contacts with students.

Types of Organization of Personnel Work

The contribution of teachers and specialists will vary with the type of organization but in any form of organization the guidance services of both teachers and specialists are essential. Although every college and university has developed a form of organization unique in some respects, three main types of organization may be distinguished—the centralized personnel department, the coördinated counselor plan, and the faculty-counselor plan. The centralized personnel department staffed by specialists and set apart from the instructional staff has been tried and found wanting. Even in a small college, specialists cannot do all the personnel work. Faculty members lacking in the personnel point of view can create more student problems than a large staff of spe-

*Presented before the twentieth annual meeting of the American Student Health Association, New York City, December 28-29, 1939.

†Teachers College, Columbia University.

cialists can solve, and can undo in a few minutes hours of skillful therapy.

The coördinated plan making use of specially trained counselors or faculty members serving as counselors part of their time and headed up by a dean or personnel director is the most common form of organization at present. It is in operation in different forms at Columbia College, the University of Chicago, and Stevens College —to mention only a few institutions. An essential feature of this plan is the systematic in-service program of education of counselors carried on under the leadership of a trained and skillful personnel worker. The physical education or health education instructor may well be chosen to devote part of his time to counseling duties. He is usually well qualified by personality to serve in such a capacity and needs only to familiarize himself with technical academic requirements and to participate in the systematic program of in-service education. In Australia, the suggestion was made that physical education teachers be educated to guide as well as to teach so that they may devote an increasingly large amount of time to counseling as they grow older.

The third type of organization is far less common than the coördinated-counselor plan and is found at present only in the more progressive type of institution. In this form of organization the core-curriculum teacher is the key person in the program. This teacher is responsible for knowing each of his thirty or forty students as individuals and for making available to them the experiences, information and counsel which they need. To accomplish this purpose he draws upon specialists and resources within the school and in the community.

The Specific Contribution of the Physical Education and Health Education Teacher

The teacher of physical education and health education makes a contribution, first of all, through his personal relationships with students. And this relationship is an individualized relationship. One student needs sympathy and encouragement, another needs constructive criticism; one needs to face difficulty while another should have the stage set for a series of successes. It is a well established fact that a relationship of trust and confidence and genuine attention with some person is a crucial factor in an adolescent's development.

The second contribution which the physical and health education teacher makes is to the understanding of students. No one has better opportunities to observe the student's relation to other persons, his interests, his response to certain kinds of difficulties, and his proficiency in physical skills. Frequently, in a case conference called by specialists in guidance, it is the teacher who contributes the most crucial information on the case. Such information is also important to specialists who are working intensively with an individual student.

The third major contribution of the physical and health education teacher to the guidance program is through the adjustments he is able to make to individual students and to groups. If the physician, after a day of making health examinations, will bring the cases that need some attention to a joint meeting of guidance officer, counselor, and physical education teacher, any administrative or instructional adjustments necessary for these students may be immediately effected. The most common type of adjustment is the modification of the physical activity program to meet individual needs—need for rest instead of strenuous activity, need for corrective work, need for proficiency in sports that are popular in his social group, and need for the friendly contacts established through physical education activities. More subtle personality needs may also be met through individualized physical education. The mentally and emotionally disturbed student should not be bothered with rules at first but encouraged to practice volleying as in ping-pong and badminton. The student who has always been over-sensitive about her height will recognize, perhaps for the first time, her height as an asset in playing tennis, or jumping center in basketball. The demands of a play environment may lead the too-introspective student to direct his attention to things outside himself.

The fourth contribution of the physical and health education teacher is in supplying information which students need to solve their health problems. If this information is given in class, effort must be made to ascertain them through tests of health knowledge; the keeping of daily schedules which will reveal health habits; examination of the students' health records; interviews, discussions, and questionnaires, aimed to elicit their real health interests and problems. Such a preliminary study of the students' health needs not only prevents repetition of familiar subject matter but also has the motivating and therapeutic value of making them aware of their interests and needs.

These, briefly, are important contributions of the health and physical education teacher to the development and guidance of individual students. He supplements and complements the work of guidance specialists, cooperates with other teachers in giving students the experiences, knowledge and counsel which they need, and is sensitive to all the opportunities offered in his group work and in his personal contact with students to help them fulfill their potentialities.

The
JOURNAL LANCET

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North Dakota State Medical Ass'n
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MINNEAPOLIS, MINN., DECEMBER, 1940

IN RETROSPECT

This issue brings to a close the seventy-first year of the JOURNAL-LANCET's existence. Throughout the year an attempt has been made by the Editorial Board to publish papers on widely diversified phases of medicine, in order to keep all readers abreast of the most recent developments in the entire field.

Certain subjects have been given special attention. For example, the February issue was devoted largely to pneumonia. This disease for centuries has been one of the greatest destroyers of human health and life. Recent developments have brought hope for reasonably satisfactory treatment and prevention of pneumonia. In order that the readers of the JOURNAL-LANCET might have the most authentic, last-word information on this subject, Dr. Hobart A. Reimann, one of the most outstanding workers in the field, was invited to prepare and edit this special issue.

The greater part of the May issue was devoted to child psychiatry, an extremely important subject. Our guest editors were Eric Kent Clarke and Chester A. Stewart, both very well known in their fields.

We believe that all readers of the JOURNAL-LANCET take pride in the fact that many articles published during the year have been abstracted in various journals and books. The members of the Editorial Board are deeply appreciative of the fine confidence the editors of these publications have manifested in their work by publishing such abstracts.

The present issue contains an index of authors and articles for the year, 1940, which each reader is asked to carefully inspect with the idea of offering suggestions and criticisms. The members of the Editorial Board do not claim infallibility; they welcome criticisms and suggestions, as it is their keen desire to have each volume of the JOURNAL-LANCET better than the last.

J. A. M.

BETTER NAME WANTED

The person who boasts that he has never been sick in his life will frequently admit under further questioning that he has had a "bad cold" now and then but that he did not count that because he thought it of little importance. It was common and to him had no identity as a specific disease. It is strangely contradictory, this expression, and yet of fairly common usage. Most persons speak of the common cold as a "bad cold." The physician chuckles and says, "I never heard of a good one; how bad was it?" He can only judge its importance by further questioning. Was there any disability? Was he confined to his home? Did he have to stay in bed, and what were his symptoms?

The term "common cold" is also unsatisfactory. The adjective is all right because it bespeaks its frequency, but the word "cold" has no definite meaning here. By common usage, it signifies an inflammation of the mucous membrane of the nose and throat following exposure; hence rhinopharyngitis would seem to be appropriate. It is not quite as simple as that, however, because of the mucous membrane extensions and the systemic absorptions that are so frequently a part of it. One may argue that these are superimposed upon the common cold, but the patient does not recognize such fine distinctions. If he attempts to be more specific, he may divide them into head colds and chest colds, but beyond that he cannot go.

The physician himself is often content to give a cold the high-sounding but all-inclusive name of upper respiratory infection. This suggests an element of hedging, but even then it recognizes the latitude that must be allowed in these cases and is probably the best we can do for the present. In the lay mind, a common cold covers a lot of territory. People ask quite naturally why physicians have not been able to find a cure for a condition that is so common. Well, we can only say that its prevalence does not make it more curable. When we find a specific, it will no longer be common. In the meantime, we must put these patients to bed, recognizing the potential danger of colds. A. E. H.

A MESSAGE FROM THE PRESIDENT OF THE AMERICAN STUDENT HEALTH ASSOCIATION

The twenty-first annual meeting of the American Student Health Association will be held in Ann Arbor, Michigan, on December 27 and 28, with the University of Michigan as host to the organization. This twenty-first annual meeting is a special occasion to celebrate the "coming of age" of the Association and to honor its founders.

The members of the Association will also have the privilege of participating in the dedication of the magnificent new Health Service building at the University of Michigan.

The importance of college health work is greater than ever in this time of national emergency. The need for having young men and women who are intelligent and well informed on the fundamentals of healthful living is more important than ever before. The responsibility of colleges and universities of this country, therefore, in providing effective health education programs must be increased. The college health service has a better opportunity than any other group to demonstrate the results of good preventive medicine, the value of periodic health examinations and the effects of good hygiene teaching.

The coming meeting of the American Student Health Association at Ann Arbor will give those engaged in college health work an opportunity to review in retrospect the advances that have been made in this field of public health work. Likewise, it will give an opportunity for those engaged in the field to discuss their common problems and to make plans for the future development of the college health program which will meet growing needs. R. E. B.

Book Reviews

Endocrine Gynecology, by E. C. Hamblen, B.S., M.D., F.A.C.S., Associate Professor of Obstetrics and Gynecology, Duke University School of Medicine; 453 pages with index and illustrations; Springfield, Illinois: Charles C. Thomas, 1939. Price $5.50.

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E. C. Hamblen is Associate Professor of obstetrics and gynecology at Duke University School of Medicine. He is actively engaged in research in sex hormones. His book is the result of considerable research with especial reference to the application of hormone therapy to gynecological endocrinology. He has contributed extensively to medical literature on his results from the administration of the sex hormones. Throughout he has been very conservative in his statements as to the value of such treatment. In his book he presents the accepted indications for the use of the gonadotropic and estrogenic principles. He includes only a limited number of the commercial preparations which he feels have proved their usefulness.

The subject matter is liberally illustrated for the most part by line drawings and photomicrographs. The illustrations of the chapter on sex endocrine syndromes consist of some twenty-five full face and lateral drawings of a classical case standing beside a normal individual. The features of disease are thus strikingly accentuated.

Surgery of Injury and Plastic Repair, by Samuel Fomon, Ph.D., M.D.; Baltimore: Williams & Wilkins Co., 1939. Price $15.00.

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Dr. Fomon's book offers the most complete review of plastic surgery available in English. The volume is destined to become a classic in its field for it covers almost every conceivable phase of plastic repair of injury in an authoritative and clear fashion. The book has been constructed from the author's own experience with repair of injury of wounds and accidents treated by the U. S. Army Medical Corps, plus references derived from the whole literature of plastic surgery. It carries the most complete bibliography on plastic surgery yet printed. The whole field of plastic repair is considered in this volume. Nothing is omitted and technics are given in sufficient detail to be helpful to any general surgeon, as well as to those specializing in plastic surgery. The book is extremely well illustrated, giving detailed pictorial directions down to such minor points as the placement of stitches.

One of the finest things of its kind ever done, Fomon's *Surgery of Injury and Plastic Repair* should be on the shelf of every general surgeon who desires to make the best possible repair of lacerations or injuries following accidents.

Societies

TRANSACTIONS OF THE MINNEAPOLIS CLINICAL CLUB

Stated Meeting
Thursday, October 10, 1940
The Vice President, Claude J. Ehrenberg, M.D., in the Chair

KODACHROME PHOTOGRAPHY IN DERMATOLOGY

CARL W. LAYMON, M.D.

Kodachrome photography seems particularly well adapted to dermatology since, in the diagnosis of dermatoses, inspection and changes of color are relatively important. From the dermatological standpoint, still pictures are more suitable for teaching purposes than movies. Colored slides of various dermatoses were shown with a special reference to tumors and precancerous conditions.

DISCUSSION

Dr. D. D. TURNACLIFF: Colored photography of skin has demonstrated itself as one of the useful advances in teaching. Dr. Laymon has proven this to us here tonight. I am sure that we all want to thank him for showing this small portion of the collection.

SUPPLEMENTARY REPORT OF A CASE OF FACTITIAL PROCTITIS

HARRY W. CHRISTIANSON, M.D.

In May 1938 I reported a case of severe factitial proctitis. At that time I promised a further report which I should like to give at this time.

On November 26, 1937, Mrs. W., was referred to me because of severe bleeding from the rectum which occurred with or without a bowel movement. Six months previously she had finished a course of X-ray and radium therapy for a carcinoma of the cervix.

Sigmoidoscopic examination revealed marked telangiectasis of the mucosa for a distance of approximately 28 cm. from the anal verge. The mucosa bled readily which could be demonstrated by merely touching it with a wisp of cotton but grossly, there was no ulceration. Ulcers and strictures of the lower rectum not uncommonly result from radium treatments for carcinoma or epithelioma of the cervix. This case differed from the ordinary factitial proctitis because of the severity of the bleeding and the extensive telengiectasis.

The treatment at first instituted consisted of frequent blood transfusions, the administration of iron and liver compounds, 225 mgms. of Vitamin C daily, and daily injections of snake venom. The snake venom was given in increasingly larger doses starting with 0.2 cc. and increasing the dosage until 1 cc. had been reached. These injections were administered for a period of about eight months. If more than three days were permitted to elapse between the injections the patient would have a severe hemorrhage necessitating a transfusion.

On July 8, 1938, the patient was admitted to the hospital for a series of blood transfusions. She was given 250–300 cc. of blood, daily, for a period of eight days and also the snake venom. Her general condition improved and the hemoglobin estimation rose from 38 to 60 per cent (Dare). Because the bleeding diminished remarkably the administration of snake venom was decreased to twice a week and then discontinued. Vitamin C was also discontinued because the patient felt that the bleeding was diminished on those days on which the medication was omitted. She also felt that by drinking a quart of milk daily she felt much stronger. No medication has been given for almost a year except three tablespoonfuls of cod liver oil daily.

Sigmoidoscopic examination the early part of this month, (October 1940) revealed telengiectasis of the bowel for the entire distance of 22 cm. but to a much lesser degree than was present two years ago. The mucosa still bleeds readily. The lumen of the bowel in the rectosigmoid and the distal portion of the sigmoid is constricted to about half the normal diameter. It is also of interest that no gross ulceration has developed. The hemoglobin estimation has remained between 80 and 88 per cent (Dare) for a period of one year. The patient is doing her own house work and feels very well in spite of the fact that she notices a slight amount of blood with her bowel movements, occasionally.

It is also worthy of note that this patient has also developed a peculiar reaction following the ingestion of pineapples or tomatoes. Six to eight hours after the consumption of either of these foods she complains of severe abdominal cramps and diarrhea. It would seem justifiable to assume that the reaction of the bowel or other tissue changes resulting from the actinotherapy have rendered her allergic to these foods.

At the present time the prognosis in this case seems good but it is also possible that there always may be some bleeding with bowel movements.

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THE VALUE OF MACROSCOPIC AND MICROSCOPIC EXAMINATION

HARRY W. CHRISTIANSON, M.D.

The purpose of presenting this discussion concerning the value of macroscopic and microscopic examination of rectal and anal tissues is threefold.

I wish to present two case reports demonstrating that the diagnosis in each case was dependent upon a careful macroscopic and microscopic examination. These case reports also illustrate the value of a careful sigmoidoscopic examination in all cases in which there is abnormal bowel function. I also wish to cite a few cases in which the failure to accomplish proctoscopic and microscopic examination led to grave errors in diagnosis.

Several years ago a patient was admitted to a Minneapolis hospital, complaining of a severe diarrhea with bleeding. Roentgenographic examination was essentially negative. Three stools had been examined for entameba histolytica with negative results. Digital examination of the anus and rectum revealed a large mass which had "the peculiar feel" of a carcinoma, consequently the patient was advised of her condition and arrangements were made for the surgery which seemed necessary. The surgeon, however, was reluctant to proceed until he obtained further information regarding the grading of the supposed carcinoma and the author, in consultation, was requested to obtain the specimen for microscopic examination. On digital examination I found the mass as described. But sigmoidoscopic examination immediately disclosed that we were not dealing with a carcinoma because numerous typical amebic ulcers were present. Material removed from the ulcers showed numerous typical entameba histolytica to be present—(the material was examined by the same bacteriologist who had examined the stools). The patient received antiamebic treatment and the mass disappeared completely in five days. Needless to say this patient would have succumbed if an operation had been performed.

Another patient (S. S.) was admitted to a local hospital for hemorrhoidectomy. Large protruding internal and external hemorrhoids were present. On sigmoidoscopic examination a number of pedunculated polyps were found in the rectum, and these were promptly fulgurated with the monopolar current. Grossly no malignant changes had occurred in any of the polyps. While the hemorrhoids were being removed a small granular and glistening area was noticed on one of the internal hemorrhoids. This area was carefully removed and was sent to the pathologist for immediate examination. In a few minutes he reported that he was reluctant to make a positive diagnosis on the tissue without the paraffin fixation procedure but that he felt that this was a squamous cell carcinoma involving the mucous membrane. This is a relatively rare condition but on examining the paraffin sections he made a positive diagnosis of squamous cell carcinoma. These case reports demonstrate the value of careful macroscopic and microscopic examination of all tissue prior to, during and after surgical excision or other therapy.

Mr. X. was referred to me because of a persistent diarrhea of two years standing. Roentgenographic studies of the colon had been made on several occasions but had failed to reveal any abnormality. Two proctoscopic examinations had been negative also. A sigmoidoscopic examination disclosed a large polyp which completely filled the lumen of the lower sigmoid. This polyp was attached to the bowel wall by a long pedicle. It was not visible by the ordinary roentgenographic examination. The removal of the polyp by fulguration promptly cured the diarrhea. This case illustrates the value of using the 25 cm. sigmoidoscope in all cases of bowel irregularity instead of the shorter instrument or 14 cm. proctoscope and it must be apparent also that occasionally the roentgenographic study of the lower bowel will not reveal pathologic process that may be present. This latter observation has been amply demonstrated also in early cases of chronic ulcerative colitis where the disease involves only the rectum or the rectum and distal portion of the sigmoid. This is not intended as a criticism of the roentgenologist but it is a plea for closer coöperation between the roentgenologist, the physician and the proctologist.

A few years ago a patient suffering from intractable itching was referred to me by the attending physician. The referring physician had exhausted his usual remedies for the relief of this condition. The examination of the perianal tissues revealed a marked lichenification of the skin surrounding the anus and also an indurated area close to the anal verge. Microscopic examination of a specimen removed from this indurated area showed it to be squamous cell carcinoma.

A short time ago a patient was referred to me by his attending physician in order that I might continue the treatment for some "piles" which the physician had been injecting off and on for a period of six months without affecting a "cure". The patient complained of bleeding with a bowel movement and the protrusion of "piles". On sigmoidoscopic examination large internal and external hemorrhoids were observed but about 10 cm. above the dendate line a large ulcerating carcinoma was found. I recall that when I was a student in the medical school I was warned by my instructor that if I failed to do a digital examination of the rectum on every patient I might get my foot into it. This saying now is antiquated but while not devoid of its original humor and point we can say "that if we fail to insert the sigmoidoscope in every patient having any rectal symptoms or alteration of normal function we may get our foot into it."

I have cited these cases in order to demonstrate the value of a careful macroscopic and microscopic examination of tissue of the rectum and anus in situ and following surgical removal and also to prove the value of a careful sigmoidoscopic examination in all patients complaining of any bowel irregularity.

Discussion

Dr. Cyrus Hansen: This patient is a very interesting one, I think I discussed it when Dr. Christianson presented it the first time. She had no more than the average dose of radiation to this particular area. Dr. Christianson did not mention it but the last time I talked to someone who had seen her she showed no evidence of radiation injury on her skin over the fields that were treated. I talked to her family physician a while ago and the vagina is constricted down to something like the size of a small finger. There is no evidence of a carcinoma of the cervix.

Dr. J. K. Anderson: I have seen possibly 15 or 20 of these cases, principally at the University because they use the therapy over there. I wonder if the X-ray men, the gynecologists and the surgeons realize the changes we see in these bowels, where they have this extreme proctitis and stricture formation. I often have wondered about carcinoma of the cervix—what is the best thing to do—give them their treatments and let them develop these conditions with possible colostomy, or treat them by some other method, because we see them when they have to go to colostomy because of the stricture and the changes in the bowel wall. It is something to think about. I have mentioned to the X-ray men about the changes we do get. We are dealing with a powerful physical agent.

In regard to the second case, I bear with Dr. Christianson in all that he said; it is very important in some of these obscure lesions to do biopsies. Even in cases of ordinary appearing hemorrhoids you will often find a little area that should be biopsied. One of the members of the American Proctologic Society took routine biopsies of his tissues over a period of time and he found in that group that there were quite a few that had malignant changes in the hemorrhoids. In addition to that, we have these other peculiar tumors, a polyp, fibroma, liomyoma, etc.

Within the last month we have seen two cases, one man with a lump in the rectum, on digital examination it felt like carcinoma. He gave no history of any injection treatment of any sort. We did not know what the thing was as there was no mucosal change. On digital examination it felt like a malignancy but on biopsy the tissue under the mucosa looked like cottage cheese or bismuth. I do not yet know what it is but Dr. Andrus examined it and he could not find anything but inflammatory tissue. The other case came in within the last month with a large mass in his rectum which on biopsy showed a typical inflammatory lesion and on first flush felt like it was malignant. It is very important in these peculiar odd tumors we see and also cases of "garden variety" hemorrhoids, if we see a little area that looks suspicious and not typical, that it be biopsied.

Dr. Cyrus Hansen: I would like to hear a gynecologist on the discussion of factitial proctitis. Most of the patients we do treat by this method get a diarrhea toward the end of the treatment, some patients get it worse than others, but bismuth and paregoric usually take care of it. The incidence of chronic proctitis is not very high or else we are not seeing these patients as they return.

Dr. Roy Swanson: I have been fortunate in not having this condition in any of my own private cases. We feel that our fault is only in the use of radium since the X-ray men give the X-ray therapy. We are eternally vigilant about screening and packing so that the cervix is well separated from the rectum and bladder. We know that the irradiation from radium only extends in a very limited radius, and if we pack the fornices well and screen the radium well we are usually safe.

Dr. Stanley R. Maxeiner: I would like to inject the thought and ask the question if there is such a thing as susceptibility of individuals to X-ray and radium. For instance, fair haired individuals are supposed to sunburn more quickly than do brunettes.

At the present time we have a patient who is supposed to have had an ordinary dose of radium for carcinoma of the cervix. The entire posterior wall of the bladder together with the urethra and the entire anterior wall of the rectum, that is, the rectovaginal septum has sloughed out. She has incontinence of both urine and feces which run out constantly from the vagina and produce a most irritating condition of the perineum.

A review of the literature reveals the fact that a number of cases have been operated upon for this condition by closing the vulva and permitting the anal sphincter which remains intact, to control both feces and urine. The condition is almost intolerable and the patient is entitled to some type of relief.

Dr. Leo Rigler: I think it is safe to assume that the difference in susceptibility of different individuals is not very great. In most instances the type of case which Dr. Maxeiner reported, occurs as a result of an error in technique rather than because of any difference in susceptibility. In general, I believe it is much safer for us to assume that these marked secondary changes from radiation are due to errors in technique.

Dr. Carl Laymon: A few years ago we saw a patient who had psoriasis who had taken arsenic and developed carcinoma and was treated by X-rays. He developed what we thought was an extremely intense reaction to the moderate dosage which was used. It stimulated our interest and we reviewed the subject of idiosyncrasy to X-rays. The concensus in the literature is that no true idiosyncrasy exists, even though there are certain variations in tolerance. Most so-called cases of idiosyncrasy are due to technical errors in measuring the dosage.

Dr. H. W. Christianson: I believe factitial proctitis is a justifiable lesion. This patient had recurrence and drastic treatment therefore was thought advisable. Factitial proctitis does not indicate, necessarily, poor technique on the part of the radiologist.

Dr. C. J. EHRENBERG: I was hoping someone would ask the question of how much radiation dosage this patient had. Do you know, Dr. Hansen?

Dr. CYRUS HANSEN: I have forgotten the exact dosage now but not more than we give ordinarily as a routine dose, not unusual at any time.

Dr. C. J. EHRENBERG: What is that average?

Dr. CYRUS HANSEN: We usually treat these people from three fields for the average sized individual, and we will run up to 2000 roentgens per field, sometimes 2400, which is a relatively small dosage compared to the dosage they are giving at some places. We run them until they are developing a dry erythema without vesiculation. It is probable that one should reduce the X-ray but we know that the largest dose that we dare to put in is insufficient at times to stop the cancer.

Dr. C. J. EHRENBERG: When you speak of the dosage, is that delivered into the skin or delivered at the tumor?

Dr. CYRUS HANSEN: On the skin. To the tumor at 10 cm. beneath the skin it is about 50 per cent of the dosage of the skin.

Dr. C. J. EHRENBERG: I would like to ask a question of one of the radiologists. What percentage of these cases do develop a proctitis?

Dr. RUSSELL MORSE: I do not know of any incidence of this condition in my own cases but very few of them have been proctoscoped.

Dr. H. W. CHRISTIANSON: It has been estimated that 3 per cent develop a proctitis.

Dr. C. J. EHRENBERG: In defense of the gynecologists' position with a result such as this, carcinoma of the cervix is a highly destructive lesion. I think it has been pretty well established that the so-called high dosage has been more effective in treating carcinoma of the cervix than the so-called low dosage. Carcinoma of the cervix and carcinoma of the corpus that for some reason is inoperable, are highly destructive lesions that must be treated radically. With any type of radical treatment a certain number of complications are to be expected and must be accepted. This patient reported upon has had a very difficult time but apparently her carcinoma is cured. She has had three separate series of irradiation treatments which is not the usual case. Usually one series of treatments including the deep X-ray therapy plus the radium irradiation is considered sufficient and if the lesion recurs some other means is used to remove it. The recurrence of a lesion completely irradiated is generally accepted as evidence of lessened radiosensitivity and as contraindicating further irradiation.

Dr. H. W. CHRISTIANSON: With reference to the case of anal pruritus complicated by the epithelioma, I believe the latter was coincident with the pruritus and not a result.

GASTROENTEROSTOMY

(A motion picture)

JAMES M. HAYES, M.D.

This moving picture was taken for the purpose of emphasizing certain points of special importance in performing a gastroenterostomy.

This patient, 28 years of age, had an acute perforation of the duodenal ulcer about one year before this gastroenterostomy was performed. As may be seen in the picture, the hard indurated area about the pylorus had produced a marked obstruction at the pyloric outlet. This had resulted in a severe gastritis. The patient was unable to retain food and has had severe gastric symptoms for several weeks. The symptoms were gradually increasing. With such a severe gastritis of long duration, a resection of the stomach perhaps would be indicated. In these of short duration the gastroenterostomy properly done, usually gives good results. The results so far in this case are excellent. It is about three months since she was operated. As you see, the posterior type of gastroenterostomy was done. Most surgeons agree today that unless some unusual condition prevails to hinder taking the posterior route, this gives far better results than the anterior gastroenterostomy. The percentage of gastrojejunal ulcer (not more than 2 per cent) is so small that this condition usually does not warrant a gastric resection. The mortality rate is so much higher with resection that one would probably be justified in trying a gastroenterostomy even though some patients should have to have a resection later. Important points in the success of a gastroenterostomy are: (1) Pyloric obstruction must be present; (2) stoma should be at the lowest point of the stomach; (3) the proximal loop of the jejunum must not be too short, causing tension, nor too long, leaving a bag for collection of material; (4) the stoma must be neither too large nor too small; (5) hemorrhage must be well controlled.

ERNEST R. ANDERSON, M.D., *Secretary.*

The University of Minnesota announces the winter schedule of continuation hospital and medical courses as follows:

January 2 to 4—Problems of Executive Housekeepers (for representatives of hotels, hospitals and institutions).

January 20 to 25—Ophthalmology (for ophthalmologists and otolaryngologists).

January 27 to February 1—Hospital Administration.

February 3 to 5—Uterine Bleeding (for gynecologists and radiologists).

February 13 to 15—Medical Social Service.

February 20 to 22—Dietetics (for dietitians).

March 3 to 5—Internal Medicine.

March 6 to 8—Obstetric and Pediatric Nursing.

The sessions will be conducted at the Center for Continuation Study, which also provides living accommodations for those who attend the courses at an average rate of $1.25 a day for a room and $1.50 a day for meals. Tuition varies from $5 to $10 for hospital courses and $15 to $25 for medical courses. For further information address Director, Center for Continuation Study, University of Minnesota, Minneapolis, Minnesota.

PRELIMINARY PROGRAM

The Twenty-First Annual Meeting of The American Student Health Association

Ann Arbor, Michigan

Friday and Saturday

December 27 and 28, 1940

FRIDAY, DECEMBER 27

Morning Session

Registration—9:30 to 10:00. Health Service Building.

10:00 to 12:00 Call to order by President—Dr. Ruth E. Boynton, University of Minnesota.

Welcome—Dr. Warren E. Forsythe, University of Michigan.

Paper: The Health Responsibilities and Contributions of the School Physician to Physical Education—DR. JOHN SUNDWALL, University of Michigan.

Paper: Obesity in Relation to Diet—DR. L. H. NEWBURGH, University of Michigan.

Paper: Dental Caries in Relation to Carbohydrate Metabolism—DR. PHILIP JAY, University of Michigan.

Paper: Medical Supervision of Athletes—DR. W. H. YORK, Princeton University.

Association Luncheon—12:30.

Address by President—Dr. Ruth E. Boynton, University of Minnesota.

Report by Secretary-Treasurer — Dr. Ralph I. Canuteson, University of Kansas.

Appointment of Nominating Committee.

Reports of Chairmen of Standing Committees (5 minutes each).

Committee on Health Service—DR. J. WILBUR ARMSTRONG, Berea College.

Committee on Organization and Administration—DR. W. B. BROWN, Stephens College.

Committee on Informational Hygiene, DR. CHARLES E. SHEPARD, Stanford University.

Committee on Hygiene of Physical Activities Professor W. R. LA PORTE, University of Southern California.

Committee on Health Problems of College Women — DR. GLENADINE SNOW, Michigan State Normal College.

Committee on Tuberculosis — DR. C. E. LYGHT, Carleton College.

Committee on Local Sections—DR. DEAN F. SMILEY, Cornell University.

Committee on Eye Health — DR. R. W. BRADSHAW, Oberlin College.

Committee on Mental Hygiene — DR. T. RAPHAEL, University of Michigan.

Afternoon Session

Round Table Sessions—2:30 to 4:00.

Committee on Health Service. Chairman: DR. J. WILBUR ARMSTRONG, Berea College. Topic: Hearing Impairment in College Students.

Committee on Informational Hygiene. Chairman: DR. CHARLES E. SHEPARD, Stanford University. Topic: Evaluation of College Health Instruction: Instructors and Material.

Tour of University of Michigan Health Service Building—4:00.

Council Meeting—4:00.

Banquet—7:00.

Presiding: DR. JOHN SUNDWALL, University of Michigan.

Speakers: DR. J. E. RAYCROFT, Princeton, New Jersey: History of Student Health Work. DR. THOMAS E. STOREY, Stanford University: The Interdepartmental Social Hygiene Board and the President's Committee of Fifty.

SATURDAY, DECEMBER 28

Morning Session

Round Table Sessions—9:00 to 10:30.

Committee on Organization and Administration. Chairman: DR. WILLIAM B. BROWN, Stephens College. Topic: Group Hospital Insurance.

Committee on Health Problems of College Women. Chairman: DR. GLENADINE SNOW, Michigan State Normal College. Topic: The Relation of the Student Health Service to Preparation for Life After College.

10:30 to 12:00 Committee on Hygiene of Physical Activities. Chairman: Prof. WILLIAM LA PORTE, University of Southern California. Topic: Essential Steps in Coördinating the School Health and Physical Education Programs.

Committee on Eye Health. Chairman: DR. R. W. BRADSHAW, Oberlin College. Topic: Eye Health.

Tuberculosis Committee Luncheon—12:30.

Council Luncheon—12:30.

Afternoon Session

General Session—2:00.

Business Meeting:
Report of Council Meeting.
Report of Nominating Committee.

Paper: Complaint and Situation—DR. T. RAPHAEL, University of Michigan.

Paper: Health Teaching (Speaker to be announced).

Paper: Vision Defects Developing in Four Years of College — DR. J. D. SCHONWALD, Miami University.

Paper: To be announced.

Secretary's Letter

SOUTH DAKOTA STATE MEDICAL ASSOCIATION

MEDICAL PREPAREDNESS

Several of the District Societies have appointed their District Committees on Medical Preparedness as follows:

District No. 1—Drs. W. A. Bates, chairman, H. I. King, J. E. Bruner.

District No. 3—Drs. J. R. Westaby, chairman, N. K. Hopkins, G. J. Gulbrandsen.

District No. 6—Drs. W. R. Ball, F. J. Tobin and Earl Young.

District No. 7—Drs. O. C. Erickson, L. G. Leraan and H. W. Zellhoefer.

District No. 9—Drs. J. D. Bailey, chairman, H. E. Davidson, F. A. Richards, C. F. Morsman and J. H. Davis.

District No. 10—Drs. R. J. Quinn, A. O. Carmack and R. M. Malster.

District No. 11—Drs. Robert Catey, F. C. Totten and W. A. George.

. . . . . .

It is of interest to note that the official ruling in regard to venereal diseases is "No man with acute or chronic disease will be accepted for military services. For administrative purposes, Selective Service will consider two positive serological tests performed within three months to be evidence of latent syphilis and be cause for rejection."

COUNCIL MEETING

Huron, So. Dak., Oct. 29, 1940

Council of the South Dakota State Medical Association convened at the Marvin Hughitt Hotel, 10:00 A. M., Tuesday, October 29, 1940. Meeting was called to order by Chairman Hohf. Roll call by Secretary. Those present: O. J. Mabee, B. M. Hart, J. D. Whiteside, W. G. Magee, D. S. Baughman, C. E. Robbins, G. E. Burman, W. E. Donahoe, S. M. Hohf, R. V. Overton, C. E. Lowe, Wm. Duncan, J. C. Shirley, C. E. Sherwood and Attorney Karl Goldsmith. The minutes of the previous meeting as printed in the October issue of the JOURNAL-LANCET were approved as printed without reading.

General discussion of the proposal of the Surgeon General of the U. S. Public Health Service, that all registrants under the selective service act be examined serologically at the registration point. This was discussed by Dr. Cook and numerous other men. The action of the Minnesota Council on this proposal with their resolution was considered. Dr. Cook pointed out that the state and territorial Health Officers Association disapproved of this procedure as being impractical but announced a compromise plan decided upon to be used in several states, this state being one. This called for an examination serologically, of each man called for physical examination. After thorough discussion it was moved by Dr. Robbins and seconded by Dr. Baughman, that the Council of the South Dakota State Medical Association go on record as recommending the wholehearted coöperation of the association and its members individually with the State Board of Health and the government in carrying out the medical part of the defense program. Unanimously carried.

Dr. Cook and others discussed the problem of the refugee physicians.

Dr. Duncan presented the medical defense program and general discussion ensued.

Matters of interest to the medical profession likely to come before the 1941 session of the legislature were discussed. Dr. Shirley moved that a special legislative committee of five to coöperate with our attorney in matters to come before the legislature be appointed by the chairman. Motion carried. (Dr. Hohf appointed subsequently as this committee: E. A. Pittenger, chairman, J. C. Shirley, T. F. Riggs, O. J. Mabee and C. E. Sherwood).

The secretary called attention to the fact that the House of Delegates, at the last annual session authorized the establishment of a benevolent fund and that nothing had been done about it as yet. It was moved by Dr. Hart and seconded by Dr. Magee that the chairman appoint a committee of three to coöperate with the ladies auxiliary of the association in formulating plans for the establishment and permanent organization of a Benevolent fund. Motion carried. (Dr. Hohf appointed subsequently as this committee: D. S. Baughman, chairman, W. E. Donahoe and C. E. Sherwood).

After discussion, it was agreed that 10:00 o'clock at Huron was probably the best time for Council meetings.

Bill for expenses of the committee on medical preparedness was presented by Dr. Duncan for $7.36. This was approved and allowed.

The meeting was adjourned at 12:45 to meet in the dining room for luncheon.

Respectfully submitted,
CLARENCE E. SHERWOOD, *Secretary.*

WOMAN'S AUXILIARY TO THE SOUTH DAKOTA STATE MEDICAL ASSOCIATION

The *Bulletin,* the official publication of the Woman's Auxiliary to the American Medical Association, is issued quarterly, $1.00 a year. Send subscriptions to Mrs. H. E. Christenberry, Highland Drive, Knoxville, Tennessee, or to Mrs. D. S. Baughman, State *Bulletin* Chairman, Madison, South Dakota.

A meeting of the Seventh District Medical Auxiliary was held at the home of Mrs. O. C. Erickson of Huron, South Dakota, recently. Mrs. Anton Hyden, president, was in charge of the meeting.

The Fourth District Medical Auxiliary met on October 9 at the home of Mrs. B. M. Hart, president, of Onida, South Dakota. An address was given by Dr. B. M. Hart, state chairman of the Medical Advisory Committee.

News Items

Dr. Frank J. Hill, Manistee, Michigan, was recently appointed North Dakota state epidemiologist and director of the division of preventable diseases. Dr. Hill replaces Dr. John A. Cowan, who resigned to accept a position as city health officer at Sioux City, Iowa.

Dr. Walter G. Benjamin, Pipestone, Minnesota, was elected president of the Southwestern Minnesota Medical Society, at the annual meeting held in Worthington, Minnesota. Other officers chosen were: President-elect, Dr. P. W. Harrison, Worthington; vice-president, Dr. H. P. Basinger, Windom; secretary-treasurer, Dr. B. O. Mork, Jr., Worthington.

Dr. Max H. Hoffman, St. Paul, was elected president of the Minnesota Society of Internal Medicine recently. Other officers named are: Dr. C. J. Watson of Minneapolis, vice-president; Dr. R. A. Johnson of Minneapolis, re-elected secretary-treasurer.

According to figures compiled by the New York Tuberculosis and Health association, the tuberculosis death rate in Minneapolis for 1939 was the lowest of any city in the United States in the 300,000-500,000 population group.

Dr. R. S. Westaby, Madison, South Dakota, was named president of the South Dakota Public Health association at the annual meeting held in Huron, South Dakota, recently. Dr. G. L. Hickman, Bryant, was named vice-president and Dr. J. F. D. Cook, Pierre, was re-elected secretary-treasurer.

Dr. Wesley W. Spink, assistant professor of medicine at the University of Minnesota Medical School, recently received a grant-in-aid from the Committee on Scientific Research of the American Medical Association to support an investigation of antistaphylococcal immunity and the nutritional requirements of staphylococci. Dr. Spink has also received a grant from Merck and Company in support of a study of ascorbic acid and its relation to the immune mechanism.

Dr. J. J. Pendergast, formerly of Pueblo, Colorado, is now associated with Dr. W. T. Wenner of St. Cloud, Minnesota.

Dr. P. W. Demo of Wells, Minnesota, was elected president of the Blue Earth Valley Medical Society at a meeting held in Blue Earth on November 7th. Other officers elected are: Dr. J. J. Heimark, Fairmont, vice-president; Dr. J. L. Mills, Winnebago, secretary-treasurer.

Dr. J. A. Kittelson and Dr. G. I. W. Cottam of Sioux Falls, South Dakota, have been elected to membership in the American College of Surgeons.

Dr. Gordon C. MacRae has been named chairman of the Public health committee of the Duluth Chamber of Commerce for 1940-41. Dr. William R. Bagley will act as director chairman. The committee held its organization meeting November 22.

Dr. G. W. Toomey of Devils Lake, North Dakota, has been elected to the American College of Surgeons.

Dr. Harold S. Diehl, dean of the Medical School of the University of Minnesota, has been appointed a member of the Subcommittee on Medical Education of the Health and Medical Committee of the National Defense Council. Other members of this subcommittee are: Dr. C. S. Burwell, dean of the Harvard Medical School; Dr. L. R. Chandler, dean of the Stanford University Medical School; Dr. W. C. Rappleye, dean of Columbia University Medical School and acting commissioner of hospitals of the city of New York, and Dr. J. H. Musser, professor of medicine of Tulane University School of Medicine. The general Health and Medical Committee was appointed by President Roosevelt on September 19 to survey and coördinate the medical resources of the country in the interests of national defense.

Dr. J. A. Myers of Minneapolis addressed the County Medical Society in Mason City, Iowa, on November 19th; the South Dakota Educational Association in Aberdeen, South Dakota, on November 25th; and the Onondaga County Medical Society, Syracuse, New York, on November 28th. Dr. Myers' subject was: "Public Health Aspects of Tuberculosis."

Dr. B. E. Hempstead of Rochester, Minnesota, was elected president of the Olmsted-Houston-Fillmore-Dodge County Medical society on November 6. Other officers elected are: Dr. C. B. McKaig, Pine Island, vice-president, and Dr. M. J. Anderson of Rochester, re-elected secretary-treasurer.

Dr. J. V. Sherwood of Sanator, South Dakota, was elected president of the Black Hills District Medical Society, at a meeting held in Deadwood on November 21. Dr. D. L. Kegaries of Rapid City was elected vice-president and Dr. H. E. Davidson, secretary.

ERRATUM

The news item which appeared on page 520 of the November 1940 issue of the JOURNAL-LANCET should have read as follows: Dr. John H. Moore, Grand Forks, North Dakota, was elected president of the Central Association of Obstetricians and Gynecologists at its twelfth annual meeting in Indianapolis. He will take office at the next session in New Orleans, 1941.

Necrology

Dr. Bernt Odegaard, 51, of Mayville, North Dakota, died October 25, 1940, at a Fargo (North Dakota) hospital, following injuries received in an automobile accident.

Dr. S. S. Blacklock, 66, superintendent of Rood Hospital, Hibbing, Minnesota, well known in Northwest medical circles, died November 12, 1940.

Dr. F. W. Briggs, 66, of Havre, Montana, died October 27, 1940, in the Columbus hospital in Great Falls.

Classified Advertisements

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General practice. Northwestern Minnesota. Established thirteen years. Income $18,000. Complete office, hospital and household equipment—the latter being optional. Will introduce. Desire to specialize is reason for leaving. Address Box 692, care this office.

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for beginning or established physician to share suite of offices with another physician or dentist. Individual treatment room or laboratory, in new office building located in very best residential retail section. Address Box 653, care this office.

NEW INSTRUMENTS

"Medical Index" keeps you posted on the new professional equipment, surgical instruments, medical supplies, orthopedic appliances. Over 50 new products born of the demands of medical science and ingenuity of man described and illustrated monthly. The only publication in the professional field exclusively devoted to products of a medical or surgical application. Year $2.00. Sample copy 25c. Write Medical Index, Inc., 22-F West 48th St., New York.

Advertiser's Announcements

MAXITATE (Mannitol Hexanitrate)

In his book, *Manual of Pharmacology*, Sollman shows that of the nitrite group of vasodilators, mannitol hexanitrate has the most prolonged effect, lasting 5 to 6 hours; also the action is shown to be gradual. This organic nitrate, formerly obtainable only in Europe, is now manufactured in this country. It is marketed in $\frac{1}{4}$ gr. and $\frac{1}{2}$ gr. tablets under the name of Maxitate by the R. J. Strasenburgh Company, Rochester, New York. Maxitate $\frac{1}{2}$ gr. tablets are also combined with Phenobarbital either $\frac{1}{4}$ gr. or $\frac{1}{2}$ gr. for the convenience of the doctor. Maxitate is indicated in the treatment of essential hypertension and angina pectoris. As a prophylactic against anginal pain Maxitate has been found to be very useful. With the proper regulation of dosage by the doctor, vasodilation may be maintained for more than the 5 to 6 hour period.

Maxitate Tablets and Maxitate with Phenobarbital are supplied in bottles of 100 and 1000.

Nelson Laboratories, of Sioux Falls, South Dakota, and Burlington, Iowa, are distributors for Maxitate and Maxitate with Phenobarbital.

PROMPT RELIEF IN PRURITUS

Itching is a symptom common to many, though unrelated conditions, and requires prompt control because of the adverse psychologic influence it exerts upon the patient. Furthermore the uncontrollable desire to scratch associated with severe itching often leads to secondary traumatic lesions which may become infected or which may aggravate the primary affection. Many years of wide usage establish the dependable antipruritic influence of Calmitol. Applied locally to the involved area, Calmitol Ointment promptly relieves itching. It may be used in conjunction with any other indicated type of therapy. For exceptionally severe itching of intact skin areas, Calmitol Liquid will be found exceedingly efficacious.

DIAGNOSIS AND TREATMENT OF EPIDERMOPHYTOSES
(Allergic Manifestations)

Inflammatory conditions of the skin produced by fungi (dermatophytoses) are quite frequent. The most common example is ringworm, or trichophytosis, produced by a tinea, or trichophyton, fungus. Familiar lesions are those on the feet, especially between the toes, and are known popularly as "athlete's foot."

Sensitivity is revealed by a positive trichophyton test. The test is specific, but not specifically diagnostic inasmuch as it may be positive in persons who have recovered from a previous infection. It is, however, a valuable aid in diagnosis.

TRICHOPHYTON 'U F A' (Undenatured Fungus Antigen, Lilly) is prepared from *Trichophyton interdigitale* isolated from cases of epidermophytosis (athlete's foot). The Krueger method for the preparation of undenatured bacterial antigens is employed. For the trichophyton test, 0.1 cc. of a 1:5 dilution of 'U F A'—70 is injected intracutaneously on the anterior surface of the forearm. The reaction, like the tuberculin reaction, is of the delayed type and should be read in twenty-four to forty-eight hours.

Repeated injections of trichophyton (fungus antigen) into the skin reduce the sensitivity to it in a great many of the sensitive subjects, if not all. The trichophyton antigen solution incorporated in a water-soluble jelly base (TRICHOPHYTON JELLY 'U F A'—75) may be applied to the allergic lesions for local desensitization. It is applied once a day, proceeding cautiously at first so as to determine the limits of skin tolerance, for irritation is always a possibility in patients highly sensitive to the fungus allergens.

THE SCHOOL-CHILD'S BREAKFAST

Many a child is scolded for dullness when he should be treated for undernourishment. In hundreds of homes a "continental" breakfast of a roll and coffee is the rule. If, day after day, a child breaks the night's fast of twelve hours on this scant fare, small wonder that he is listless, nervous, or stupid at school. A happy solution to the problem is Pablum (Mead's Cereal cooked and dried). Six times richer than fluid milk in calcium, ten times higher than spinach in iron, containing vitamins B_1 and G, Pablum furnishes protective factors especially needed by the school-child. The ease with which Pablum can be prepared enlists the mother's coöperation in serving a nutritious breakfast. This palatable cereal requires no further cooking and can be prepared simply by adding milk or water of any desired temperature.