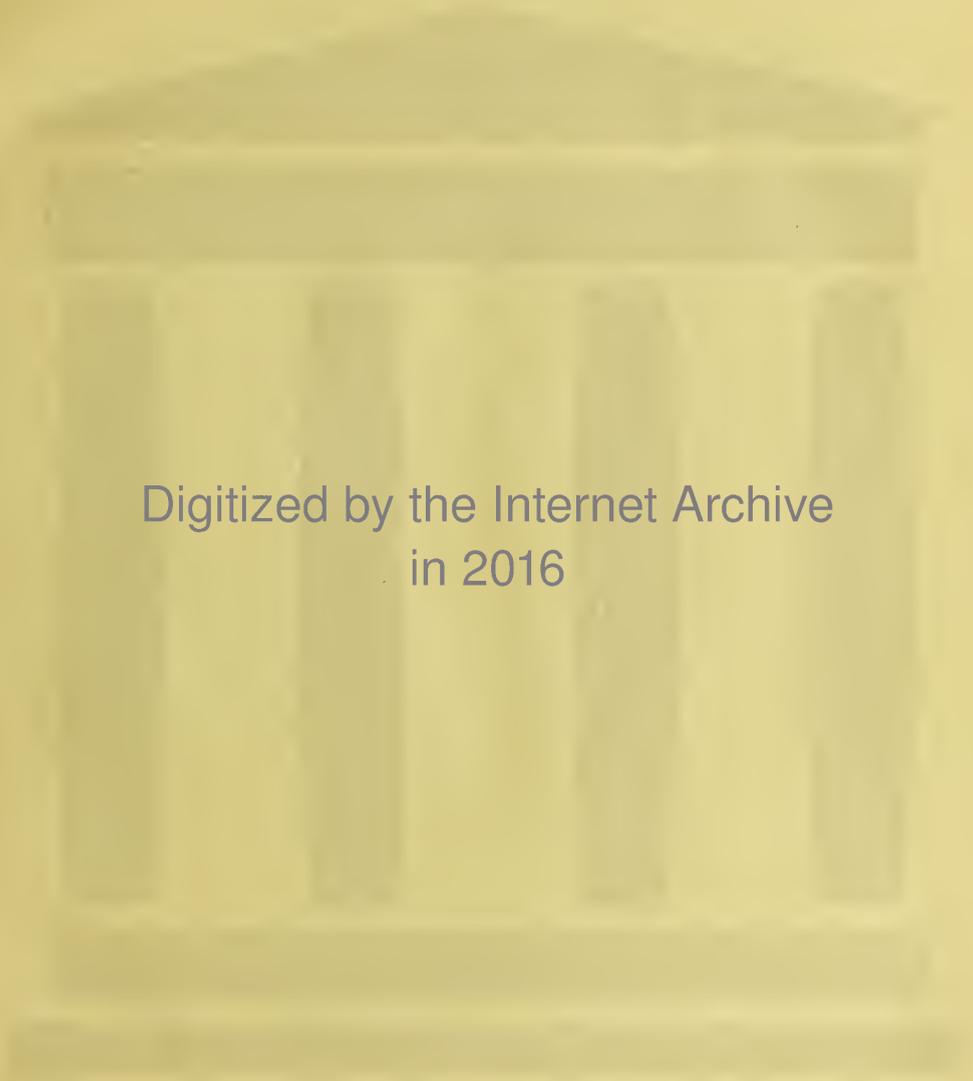




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# THE JOURNAL-~~L~~ANCET

Represents the Medical Profession of  
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North Dakota State Medical Association  
South Dakota State Medical Association

Minnesota Academy of Medicine  
Hennepin County Medical Society

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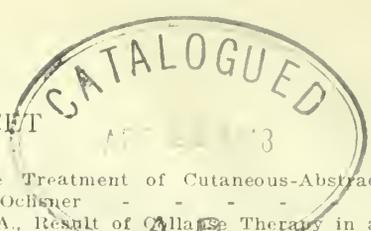
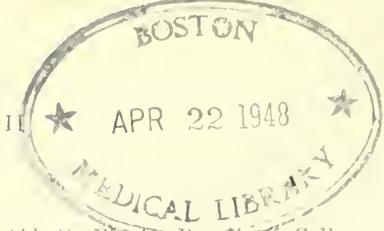
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The Council of the South Dakota State Medical Association, held their December meeting, at Watertown, December 6, 1932. Plans for the legislative program for the 1933 session were the items of business under discussion. A Basic Science Bill will be introduced as a Public Welfare measure by the Association.

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters). Speaker: William A. O'Brien, M. D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month of December will be as follows: December 7th—Congenital Heart Disease; December 14th—Control of Tuberculosis; December 21st—X-ray in Medicine; December 28th—Periodic Health Examination.

A meeting of the Seventh Councilor District Medical Society at Superior, Neb., on October 27th, had a decidedly Minnesota atmosphere. The feature papers were given by Dr. Chas. W. Mayo and Dr. Fred L. Smith of the Mayo Clinic, and an excellent paper was also given by Dr. Clayton Andrews of Lincoln, Neb., who was a Fellow at the Mayo Foundation. The president of the Society was Chas. McMahon, a Minnesota graduate who practiced in Hibbing, Minn., for several years. The attendance established a record for the Society. Dr. Mayo's paper on "Acute Intusseption," Dr. Smith's on "Varicose Vein Treatment by Injection," and Dr. Andrews' on "Appendicitis," were enthusiastically received. The Minnesota men, past and present, lunched together before the meeting.

President E. H. Cary of the American Medical Association will be in Minneapolis, Sunday, December 18, to address a joint conference called by Dr. M. S. Henderson, president of the Minnesota State Medical Association and sponsored by the Hennepin and Ramsey County Medical Societies. The conference will be held at the Nicollet Hotel. It will begin at 2:30 p.m. and last through the dinner hour. The entire Minnesota medical profession have been invited to attend. Contract practise as proposed in the majority report of the committee on the costs of medical care is the general subject to be discussed. Be-

sides Dr. Cary, a group of distinguished medical speakers and authorities on the subject of medical economics will be present to talk and lead discussion. The purpose of the meeting is to form Minnesota medical opinion on the economic problems brought to a head by the published recommendations of the medical costs committee. Every physician is urged to attend.

## SOCIETIES

## MINNESOTA STATE MEDICAL ASSOCIATION CONFERENCE

Sunday, December 18, 1932—2:30 P. M.  
Nicollet Hotel, Minneapolis

The Majority Report of the Committee on the Cost of Medical Care is a high explosive! What are you going to do about it? Come to the conference. Your state membership card will admit you.

## PROGRAM

Introduction of the Chairman and Discussion Leader, E. H. Cary, M.D., of Dallas, Texas (President, A. M. A.)—E. A. Meyerding, M.D., Secretary, Minnesota State Medical Association.

"Cost of Medical Care (Why a Survey Was Made; Results Expected)"—F. S. Chapin, M.D., Ph.D., Chairman, Department of Sociology, University of Minnesota.

Majority and Minority Reports—C. E. Rudolph, M.D., D.D.S., Member Committee on Cost of Medical Care.

"What It Means to Organized Medicine"—Olin West, M.D., Secretary, American Medical Association, Chicago, Ill.

## GENERAL DISCUSSION

"What Organized Medicine Believes"—E. H. Cary, M.D., President, American Medical Association.

"What Can Be Done?"—C. B. Wright, M.D., Chairman, American Medical Association Legislative Committee.

"Some Principles"—M. S. Henderson, M.D., President, Minnesota State Medical Association.

"Our Plans for 1933"—N. O. Pearce, M.D., President-elect, Minnesota State Medical Association.

"What Is the Relation of the Medical School Hospital to the Practice of Medicine?"—R. E. Scammon, M.D., Dean of Medical Sciences, University of Minnesota.

"The Health Officer and Preventive Medicine"—F. E. Harrington, M.D., Health Officer, Minneapolis.

"The Doctor and Preventive Medicine"—J. A. Thabes, M.D., President, State Board of Health.

"Group Hospitalization Plans"—Mr. A. M. Calvin, Superintendent, Mounds Park and Midway Hospital.

"What Your Committees Are Doing in Regard to These Problems"—H. M. Johnson, M.D.; L. R. Critchfield, M.D.; George Earl, M.D.; Theodore Sweetser, M.D.

# THE JOURNAL-LANCET

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**Minnesota, North Dakota, South Dakota, and Montana**

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## INJURIES TO THE HEAD\*

WALTER E. DANDY, M. D.

Professor Neurological Surgery, Johns Hopkins University

BALTIMORE, MARYLAND

For hundreds of years medicine and surgery have tried to develop a standardized treatment for injuries of the head. It has, as you know, been entirely unsuccessful. Furthermore, it is a goal which is utterly unattainable and it stands to reason that it can never be reached because the injuries are so tremendously variable in their results.

A century ago 2 of the greatest surgeons of that period carried on a long and very acrimonious dispute about the relative merits of 2 methods of treatment. The great Percival Pott, whom we know so well through Pott's puffy tumors, Pott's fractures, and so on, operated upon practically all cases of fractures of the skull. That, of course, was in the preantiseptic period. His method of attack was to make multiple trephines along the line of fracture so far as he could identify it when operating. As you know, the lines of fracture are very long at times and the number of trephines which that great surgeon performed sometimes extended up into the twenties. I recall one testimonial obtained from a distinguished member of English royalty on whom he had done 26 trephines and he used this letter of gratitude as proof of the splendid results which followed operative treatment.

No less illustrious surgeons than Pott were Sir Charles Bell and his brother, John Bell. They

were strongly opposed to operative treatment, unless the fractures were badly depressed. Their results seemed to them—and undoubtedly they were—superior to those obtained by Pott. Percival Pott was groping in the dark in many ways. He had to deal with all of the uncertainties, or rather the certainties, of sepsis which then prevailed. In operating he was possibly introducing infection when he thought he was preventing it.

At the present time there still remain great differences of opinion, perhaps less as to operative or nonoperative treatment. Some treat conservatively, others more or less radically. There have been many new additions to our armamentarium for the treatment of injuries of the head. The treatment of cranial injuries so largely in vogue at the present time, when taken compositely, is a curious admixture of tradition, of scientific facts and of fallacies which pass under the cloak of science.

I am not sure whether the term "injuries of the head," as applied to this part of your program, was suggested by myself or by your Chairman, but the title is very much superior to "fractures of the skull" under which the subject is usually considered. The term "fractures of the skull" is very misleading; it has been carried down from past centuries when the skull alone could be treated, the brain being *noli me tangere*; it is in fact little more than a figure of speech—metonymy. Just as we say a kettle boils, so we say the skull is fractured.

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\*Read before the Association of Surgeons of the Great Northern Railway, June 29, 1931, at Glacier Park, Montana.

As a matter of fact, we are relatively little concerned with the actual fractures of the skull. In this respect fractures of the skull are entirely different in significance from all of the other bony fractures of the body. It is the injury to the intracranial contents which is all important. Patients don't die from fractures of the skull; they die from the injury to the brain. Patients don't have epilepsy from injury to the skull; they have epilepsy from injury to the brain. Far too much is the treatment of today still directed to the fracture of the skull itself. Still too frequently we are following the old treatment of Percival Pott of following fractures to their terminus as though searching for a pot of gold at the end of the rainbow. It is difficult to leave tradition and to work rather upon an anatomic, physiologic and pathologic basis. For so many years we worked blindly; although the facts are now slowly coming in, it requires time to change.

On the other hand one can and does carry out very extensive treatments today under the assumption that they are based upon scientific facts, but the facts may be entirely irrelevant or used far beyond any justification. Not long ago I was visiting one of the largest hospitals in this country. I was told that every patient who entered that hospital with an injury to the head was, first of all, sent to the x-ray room, for a stereoscopic x-ray of the side of the head and the front of the head to determine the extent of the fracture; was then sent to the dispensary where a lumbar puncture was done, the pressure of the cerebrospinal fluid was accurately measured, and as much cerebrospinal fluid was removed as possible; moreover, this was usually repeated at stated intervals. If the pressure of cerebrospinal fluid registered too much, the patient was immediately given an intravenous injection of hypertonic glucose or sodium chloride. That treatment includes about all of the modern additions to our therapeutic armamentarium except the surgical. Perhaps you might call it the medical as opposed to the surgical treatment.

What is the urgent need of rushing very ill patients to the x-ray room, moving them about from stretcher to the x-ray table and back again in order to get radiograms? Some patients are so ill that this manipulation is the "straw that breaks the camel's back," and no real good has been accomplished. It is carrying out the old tradition. When life itself is the paramount issue, we are not interested in fractures, unless depressed—and that can be determined by palpation as well as by x-rays. Only when life is safe are

we justified in considering any treatment of a depressed fracture. There is no treatment of other lines of fracture and no material help accrues from detailed knowledge of the fracture-line. Go as far as you like with x-rays, but only when the patient is out of danger.

Why perform lumbar punctures on very ill patients with injuries of the brain? They say, to find out how much pressure is in the cranial chamber and that tells us exactly where the patient stands. Perhaps that is true to a certain extent, but you can learn much more accurately the degree of intracranial injury and of pressure by the old-fashioned method of observation. There would be no harm, of course, in doing a lumbar puncture to get additional information if it were possible, if in doing so you were doing nothing harmful, but you are doing harm when you do a lumbar puncture. There is no question about it.

You can't do a lumbar puncture on a normal individual without producing headache, and if you withdraw much fluid it may persist for several days. The headache is due to cerebral injury. The injury probably occurs because the brain is thrust against the sides of the skull. If a lumbar puncture is done in the presence of increased intracranial pressure, which obtains in cerebral injuries, the resultant trauma will be proportionately greater. It is true that the patient may improve immediately after you do the lumbar puncture, but it is only a transient change. If the hemorrhage is in the posterior cranial fossa, the patient will probably be made worse instantly owing to injury of the medulla. If an extradural hemorrhage is present, the release of pressure is the worst possible thing that can happen to induce further bleeding. Even when pressure is immediately relieved it cannot last because more intracranial pressure will return in the course of a few hours from the additional damage which the puncture has created. What happens from a lumbar puncture is about what happens from the fracture itself though in lesser degree. When the skull is traumatized, the brain is injured because it is thrown against the sides of the skull. The resultant injury to the brain produces within the brain changes which are precisely similar to those which appear in the tissues elsewhere when injured. For example, an injured hand will swell in the course of a few hours. The swelling is the result of 2 components—hemorrhage and edema—and these occur in different proportions. Sometimes hemorrhage predominates, as in a black eye; at other times the swelling is largely fluid. All intracranial pressure results from hemor-

rhage and edema. It is this pressure which causes death. Lumbar puncture doesn't remove either this edema or blood. It removes the fluid from the ventricles and this nature is able to do and does in her manner of space compensation, the fluid being absorbed into the blood.

The final part of the treatment under discussion is the administration of hypertonic solutions of glucose or salt. There isn't anything more striking than the shrinkage of the brain after the introduction of a 25 per cent solution of hypertonic salt or glucose into the venous system. Why isn't that, then, a wonderful solution of our problem of treating injuries of the brain? Because there is a reaction. Just as there is a reaction after doing a lumbar puncture, so there is a reaction in the brain from the use of these strong chemical solutions. The patient may even return to consciousness, after being deeply unconscious, but it doesn't hold. The patient later becomes worse than when you began. This is a fad, which has a definite scientific fact behind it, but fails to take into consideration other physiologic and pathologic facts which are distinctly in opposition.

We are told that the cures are greater by the above methods of treatment. Everyone who has a pet form of treatment can bring statistics to prove his point. There is no field of treatment in which figures can be more deftly applied because the injuries are so extremely variable. We must be sure we are not over-treating the patient and that our over-treatment is not doing harm instead of good, or more harm than good. Did you ever let your patients alone and see the percentage which recovered? There is no doubt in my mind that if nothing is done there will be more recoveries than if the things that I have just enumerated in the modern methods of treatment are done. So many patients with severe injuries of the head will hang in the balance for hours or days, and one little thing that is harmful can destroy that balance and lose the patient.

It is true that all of these treatments can be carried out in most patients and they will survive, but in spite of and not because of what you do.

What treatment then is advocated? First, leaving the patient strictly alone until you know that nature is unable to cope with the situation. Study your patient constantly until well out of danger. Only by frequent observations can you know precisely where your patient stands. There is no panacea for injuries of the head. Each case must be considered a law unto itself. But until there is a definite indication to do something give

the patient the benefit of absolute rest. A certain percentage—perhaps 20 per cent—will be lost with the utmost available efforts because the injuries are so severe. About 70 per cent will recover if left strictly alone. About 10 per cent of the cases that would be lost if left alone can be saved by a well timed and well directed operative treatment.

How can we know at all times from clinical observations the exact state of intracranial pressure? The following observations give the desired information. (1) The state of consciousness. This is the most important observation. We know if a patient is unconscious that he has intracranial pressure beyond the limit of compensation for consciousness. If the patient's unconsciousness deepens during the next 5 or 6 hours, we know that the pressure is increasing and then surgical intervention must be considered. If the patient's consciousness is returning, we know that cerebral pressure is being reduced and that the patient is improving. Spinal puncture could give us no information so valuable as the state of consciousness alone. (2) The pulse and respirations are taken every 10 or 15 minutes and charted in curves. As long as the increased intracranial pressure is being compensated the pulse, temperature and respirations show characteristic changes. Beyond a certain degree of intracranial pressure a break in compensation must occur and this is manifest by certain other characteristic changes. A slow pulse and slow respirations are indications of intracranial compensation. A temperature below  $101.5^{\circ}$  or  $102^{\circ}$  is another valuable indication of the patient's safety. A broken compensation or an impending break in compensation is shown by vacillations in the rate of the pulse. It may be 90 one moment and 60 at another. The same is true with the respirations. They become irregular in rate and volume and may be of the Cheyne-Stokes type. One of the most important and most delicate indices of intracranial pressure is the temperature. It frequently gives us our first positive information that a break in compensation is developing. When the temperature is steadily rising, you can be sure that is the measure of intracranial pressure. Blood pressure records are of little value. Two other observations are of the utmost importance: (1) Restlessness and (2) involuntary micturition or defecation. If a patient is restless, he is on the border between compensation and a break in compensation of intracranial pressure. Restlessness means that the patient is either coming out of coma or going into it. The duration

of the period of restlessness is variable, but its meaning is invariable. Restlessness should never be submerged by morphia for our most valuable sign would be masked. Incontinence of urine or feces occurring when the patient is seemingly conscious means a break in cerebral compensation. The above observations are precisely the same as those which are made after every cranial operation and for precisely the same reason, i. e., to determine the increase of intracranial pressure. There are no other tests which can act as substitutes.

When do you operate and what type of operation is indicated? As I have said, in less than 10 per cent of cases. It is when, after a period of 6 or 8 hours, the patient shows deepening coma, cessation of restlessness, vacillation of pulse, tachycardia, increasing respirations, and a rising temperature. If a patient is going to die from injuries of the brain in less than 5 or 6 hours (excepting extradural hemorrhage), there is nothing you can do to prevent the outcome. There is no point in operating upon patients with such a high grade of intracranial pressure. When operation is indicated it must frequently be done quickly for broken compensation of pressure occurs rapidly and inexorably. An hour's indecision may make the operation useless.

What form of operative treatment do we use? A right subtemporal decompression is the only treatment which can relieve pressure constantly and safely. There are, of course, instances when even this degree of relief is not adequate. There was a time when some operators performed decompressions almost routinely and with dreadful mortality. It is needless to say that operative treatment is always dangerous except in the hands of those who are thoroughly qualified. A lumbar puncture can only give relief for a few hours at most, and then there is more pressure than before. It is necessary to relieve pressure over a period of days until the edema subsides and hemorrhage begins to subside.

It is remarkable what nature will do. A hemorrhage as large as one's fist can be adjusted to the space requirements in the skull by nature's method of squeezing out the cerebrospinal fluid then reducing the volume of the fluid spaces in the brain. That is the real function of cerebrospinal fluid: It is not to float the brain. Were it not for the cerebrospinal fluid in the ventricle and in the subarachnoid space there could be no compensation for emergencies, either of pressure or of loss of brain tissue—both from various causes.

There are 2 types of injuries of the head. The injuries that I have just mentioned give us concern about life. It does not matter whether we classify injuries into 2 types—base and vault. It is much better to consider the problem of saving life and either type may be equally serious. When life is secure our attention is then directed to disturbances of function, some of which may be helped, others must take their course. Epilepsy is one of the great sequels of cerebral injuries which may be primary within the brain or result from depressions of bone. All depressed fractures should be elevated at the earliest moment compatible with the patient's condition. This is devoid of danger. Perhaps I should have mentioned that all compound wounds of the head must be immediately converted into simple wounds by closure—and without drainage. There are no exceptions to this rule. More extensive local treatment of wounds is to be done only when the patient's condition justifies it.

There is one type of injury of the head that stands out alone in demanding prompt and effective operative treatment, i. e., those with resulting extradural hemorrhage. The actual percentage of this type of injury is small—perhaps 5 per cent—if recognized and treated correctly, and nearly all will be lost if left untreated or treated badly. Extradural hemorrhage is caused by the line of fracture crossing and tearing the middle meningeal artery in the temporal region. The hemorrhage develops steadily and quickly; as it progresses the dura is stripped from the skull, thus producing many additional bleeding points where the branches of the artery cross from the dura to the skull. The result is, therefore, an example of a vicious circle.

It is very difficult at times to tell when you have an extradural hemorrhage but it may be suspected from 3 symptoms: (1) a free interval of consciousness before a gradually deepening coma (due to intracranial pressure); (2) gradual hemiplegia affecting the face, arm and leg in the order mentioned; (3) convulsions beginning always in the face and spreading to the arm and leg. All of these signs may be absent and all may be present in primary injuries of the brain.

There is only one treatment for the extradural hemorrhage and that is to remove the hemorrhage and tie the middle meningeal artery—usually at the foramen spinosum.

Lumbar puncture or intravenous injections of hypertonic solutions of salt or glucose are particularly disastrous in the face of an extradural hemorrhage. The additional intracranial room

acquired by the release of pressure allows the dura to be stripped still more and hemorrhage goes on anew.

In the case of all injuries of the head the most important thought I should like to leave with you is this: every case of injury of the head is a law unto itself. Every case should be carefully studied with every means at our command and watched continually until all danger is past. Only when we know what is taking place in the brain are we in a position to know what is best to do. Be sure our treatments are not overdone and are not resulting in additional harm.

So much for the diagnosis and treatment of acute cranial injuries. Unfortunately there is another group of later complications which must always make one cautious in dismissing patients as cured. Some of these sequels occur days, others weeks, and others months after the primary injury. Moreover, the original injury may have appeared surprisingly trivial. Treatments, of course, are different according to the character and location of the underlying lesions. Meningitis may result if the crack in the skull passes through the infected paranasal or mastoid cells. If the patient drains cerebrospinal fluid through an infected sinus, meningitis is practically assured. There is no way to prevent it and there is little that can be done in treatment. It is, therefore, a matter of pure chance whether the sinus is infected or sterile.

If the fissure in the bone goes through a frontal sinus where the brain itself and not cerebrospinal fluid is in apposition with the skull, a brain abscess may follow. Abscesses of the brain are very much more satisfactory to treat than meningitis.

Pneumocephalus is another complication. Through a break in the paranasal sinuses, air may be forced into the brain by straining, sneezing and coughing. The air may enter the subarachnoid space, the subdural space, or the frontal lobe. The exact site of the air depends upon whether fluid or brain tissue lies immediately beneath the bony opening and whether the injury breaks through the leptomeninges. Large air cavities in the frontal lobes may eventually rupture into the lateral ventricle, producing spontaneous ventriculograms. Symptoms of intracranial pressure usually result and may persist for many weeks. After fractures through the sphenoidal cells, the air reaches the cerebrospinal fluid. There is no treatment for these patients. They may heal spontaneously or die of meningitis.

After fractures through the anterior ethmoid and frontal sinuses, or one of the other sinuses, the air reaches the subdural space or the interior of the frontal lobe. These are treated by closing the dural defect with a fascial transplant.

Then there are the remarkable cases of subdural hematoma resulting from tears in the veins crossing from the cerebral hemisphere to the longitudinal sinus. The injury to the head may be seemingly trivial. The hemorrhage fills the subdural space and covers a large part of a hemisphere, or even of both hemispheres. The hematoma becomes encapsulated and acts as a tumor. Pushing the brain ahead of it, the hematoma becomes of tremendous size and eventually causes death from intracranial pressure. The pressure continues for weeks and months before the fatal outcome. Subdural hematomas are cured by removing the hemorrhage and the lining membranes.

Subdural hydroma is quite similar to the hematoma, the difference being that fluid instead of blood fills the subdural space. The fluid pours through a defect in the arachnoid, and collects in the subdural space where it absorbs very poorly. It, too, becomes encapsulated, though more slowly than the hematoma. The symptoms are headache—usually unilateral—and at times nausea, vomiting and papilledema. Subdural hydroma is cured by evacuating the fluid through a perforator opening.

Finally, there is the condition of an arteriovenous aneurysm due to a tear along the base of the middle fossa of the skull. As you know, the internal carotid artery passes through the cavernous sinus in that region. It is the only place in the body where such a condition as this can occur but it is a not infrequent sequel. A tear in the artery permits a fistula to develop between the artery and the vein—an arteriovenous aneurysm. Were it not for the creation of the arteriovenous aneurysm the patient would doubtless bleed to death. Arteriovenous aneurysms are easily curable by ligating—either partially or totally, depending on the patient's age—the internal carotid artery in the neck.

It is evident, therefore, that of the late complications of injuries of the head, a correct diagnosis and treatment offer a high percentage of cures. Many cases of pneumocephalus, all of subdural hydroma, subdural hematoma, many brain abscesses and all arteriovenous aneurysms are curable and with little risk.

## MEDICAL AND PHARMACEUTICAL CO-OPERATION\*

By FREDERICK J. WULLING, D. Sc.

Dean of the College of Pharmacy, University of Minnesota

Earnest physicians and pharmacists are gathered here tonight; some have come from comparatively great distances; some pharmacists are the guests of physicians; some wives have accompanied their husbands; all present are in good and congenial company; the food has been good; the smokers are consuming good tobacco; all appear to be in the mood to listen to one who has the viewpoint of both the physician and the pharmacist, a viewpoint which is sympathetic to medicine and to pharmacy alike and which has been developed through many years of activity in both fields. These facts are evidence that all present subscribe to the value of friendly intercourse and of the co-operation of physicians and pharmacists, of the mutual stimulation of social and intellectual contacts toward better understanding and feeling, and of the determination to foster every reasonable means to promote better individual and collective health, and to that extent create more comfort and happiness in life.

My work is mostly of an educational and sometimes of a missionary nature. That it is fruitful is attested by the fact that the demand upon me for addresses of the kind I am attempting to give you this evening is greater than I can meet, and on that account I often earnestly wish that others would devote themselves in a larger measure to this kind of constructive and needed work. One need not be an orator or a literary expert to do this. I do not mean to flatter you when I say that every person here tonight could in some degree do similar work; every physician with pharmacists, his patients and the public, and every pharmacist with his patrons, physicians and the public.

It is too often taken for granted that everything obvious to one is obvious to all. That is not the case, and both physicians and pharmacists, especially the latter, can work with their patrons, beginning with the obvious and advancing to the less obvious, for the purpose of creating a better understanding on the part of the patrons of the really serious and responsible nature of the professional service they need. The public is not sufficiently impressed with the wonderfully efficient service the physicians and

pharmacists can and do render in this modern day, and there is a justification for attempting to create a better understanding and an appreciation of this service on the part of the public.

It should not be taken for granted that even pharmacists are fully aware of the wonderful work physicians are doing and of the wide scope of their training that must precede their treatment of the sick. Pharmacists generally would do well to seek further information and acquaintance and even study of the tremendous field of learning the physicians must encompass to enable them to practice efficiently and conscientiously.

It may be said with equal emphasis that the physicians are not sufficiently imbued with the extensive study and training and experience to which the pharmacists must subject themselves before they acquire adequate competency. If physicians would acquaint themselves with the detail of the now required minimum four-year course in pharmacy, they would more fully realize that the pharmacists are their closest and most adequately prepared allies in a very real sense, and that they are members of a responsible profession exacting of its votaries an ever increasing technical requirement.

My point is that physicians, pharmacists, and the public should know much more of one another than they do, all to the end of a better health service for those who need it. Physicians and pharmacists exist not for themselves but for the public welfare, and their aims and aspirations are all directed unselfishly and altruistically toward that end. These facts must be kept clearly in mind because they assure the realization, which not all physicians and pharmacists have as yet, of the necessity of much united and concerted work toward public health. The two professions should co-operate more willingly and effectively. They already do in a very respectable measure, but the co-operation should become much more general for the best results.

Now let us take a quick look back to the remotest time and advance rapidly to the present to illustrate more fully what I have in mind. Pharmacy is one of the oldest professions. I have heard the claim made that it is *the* oldest profession. From immemorial times disease has existed. The first to attempt to alleviate or cure

\*Address given at Lyon-Lincoln County Medical Association Marshall, Minnesota, October 20, 1931.

disease probably were those who, through superior observation, learned that certain plants and plant parts had the power to affect adversely the state of perfect health. In due course they naturally reasoned that certain plants could affect affirmatively the body that was ill or in distress. When experience finally proved the correctness of these deductions the very earliest foundations of materia medica and pharmacy were laid.

The curative herb or plant part may have been given at first in its natural or unprepared state, but it is logical to believe that even in those very earliest times the medicinal herbs, roots, leaves, exudations, etc., were prepared or compounded in some, no doubt most primitive, way to make their administration easier and pleasanter. This earliest preparation of plant parts for curative purposes constituted the ushering in, in the dawn of time, of the first exercise of the art of pharmacy. I say art of pharmacy because in those most ancient times science, as we know it today, did not yet exist. The persons who gathered and prepared and administered curative products were the forefathers of modern pharmacy. The practice of medicine grew out of pharmacy at a time when the realization grew upon man that specialization led to better and more beneficent results.

In due time in the progress of things, a respectable number of medicines had been discovered and classified according to their effects upon the body. Some of the pharmacists of that early day began to give most of their attention to the observation of the effects of medicines upon the body, leaving the collection and preparation of medicinal bodies to other pharmacists. At this point began the differentiation that resulted in the creation, long afterward, of the distinct professions of medicine and pharmacy. The lines of differentiation have been sharp and distinct for many, many centuries.

Both physicians and pharmacists existed as such in the earliest civilizations of which we have records. Medicine and pharmacy still exist as separate professions. They have lived and developed side by side from time immemorial. At times they clashed. Only a few times within the last four thousand years of which we have records did they partly merge or overlap. Always they rebounded into their ancient separateness, a separateness which is still recognized the world over and which everywhere today has the support of the law. These two professions are recognized in every civilized country of the world by legal enactments defining more or less clearly their respective spheres of activities and regulat-

ing their practice under the force of specifically formulated laws.

The continuing separateness of these two ancient professions must surely rest upon wisdom and rightness. Otherwise it would not have persisted through these untold centuries of civilization. These professions separately exist upon millennium-old foundations, and no doubt will continue to exist in their separateness as long as civilization will last.

One might ask, however, why this separateness, since both professions have essentially the same aims and purposes; namely, the preventing, alleviating, and curing of disease? They are both concerned about and essential to the maintenance of the greatest degree of individual and public health. The answer lies in the fact that the more complex civilization becomes, the greater is the need of specialization. Medicine and pharmacy are specialized fields of professional service within the larger and inclusive field of health work. Their separation began at a time in the development of civilization so long ago that it cannot be stated in chronological terms, but it must have begun at a time when what we now call medical and pharmaceutical knowledge had accumulated to a point where one person could no longer encompass and utilize it all, and, in the natural order of things under the urge and necessity of the demands of the ever increasing and accelerating development or evolution of human life and relationships, the separation completed itself gradually.

Identical reasons were responsible for the gradual separation of the multiplying activities and functions of medical and pharmaceutical practitioners into their many specialized fields of today. From homogeneity to heterogeneity is the way of progress it seems. When I speak of medicine I do so in the inclusive sense which embraces all the many specialized divisions. Pharmacy, too, is an inclusive term for many fields developed into specialties. There are today numerous medical and pharmaceutical specialists, and, though their respective fields may be far apart, they all are, nevertheless, engaged in the one common field of health work. They are comparable to the spokes of the wheel which all center in the hub. The separateness of medicine and pharmacy relates to separate functions toward a common end; that is, each profession specializes functionally toward the same end, and therefore, in its way, definitely co-operates with the other. Co-operation is therefore my keyword tonight.

Wherever consistent and intelligent co-operation exists, results are most affirmative for both physicians and pharmacists, and especially for the patients. The welfare of the patients should be, and is, the first and the mutual concern. The patients are entitled to this co-operation, and only through it can the physicians and the pharmacists discharge their respective duties fully and conscientiously. Without it both may be remiss, at least in cases where it is obviously necessary. The necessity does not exist in all cases, but in most. Where the necessity of co-operation exists but is not carried out by the one or the other, there is a real violation of duty to the sick to that extent.

Now, having laid the foundation for the realization of the need of co-operation, let us discuss it briefly, with emphasis upon a few points. First, there should be a clear understanding of the respective functions of physicians on the one hand and of pharmacists on the other. Broadly, they can be stated in this wise: the physicians make the diagnoses and prescribe the indicated remedies, and the pharmacists dispense or compound the prescribed medicines. If there is deviation from this; if the physicians dispense medicines and the pharmacists prescribe, the patients do not receive the fullest and most competent service. They receive incompetent medical and pharmaceutical service because, everything else being equal and in the light of their respective trainings, physicians are incompetent to dispense and pharmacists unqualified to diagnose and prescribe.

Here is the point at which the two professions sporadically and frequently have clashed. Sometimes their mutual transgressions in this respect have been upheld by law, as witnessed by laws which a number of times gave London and other English apothecaries the right to treat the sick and to prescribe for them. Unpleasant controversies between the two professions always followed these transgressions of respective rights, and when the medical men regularly ascended again, the laws were repealed in the interests of the sick, and normal and right conditions were periodically restored. Professional jealousies and even hatreds were often placed above the rights of the sick to the best service.

Happily there is less of this sort of thing today. There is now more fairness and rightmindedness, and generally the rights and welfare of the sick are the first and mutual concern of both physicians and pharmacists. Nevertheless, the needed harmony and co-operation are far from perfect. Some physicians still raise the question of the

ranking, socially and educationally, of the two professions, claiming superiority for medicine over pharmacy. Pharmacists resent that attitude on the ground that both professions are equally necessary to the sick, and that pharmacy partakes of the nature of medicine and is in reality the chief medical specialty and not the handmaiden of medicine.

Pharmacists freely admit, as they must, that physicians have to undergo a somewhat longer and broader training than pharmacists are required to take, but they claim that they are relatively as well trained for their work as physicians are for theirs. I do not quite agree with them in that contention, for it implies, mistakenly I believe, that the pharmacists do not need as broad and comprehensive a training as the physicians need. My feeling and conviction are that, if pharmacy is the chief medical specialty, which it undoubtedly is, then at present the pharmacists are not sufficiently trained in the basic sciences, and that they are undereducated until their training equals that of the physicians, not of course in exact kind, but in quantity and quality. In fact, the pharmacists are on the way to that goal.

Two score and more years ago when I began the study of medicine, recognized medical courses covered only two years, a very few three years, and so did pharmaceutical courses; both most inadequate. Medicine and pharmacy were on a par in that respect, but medicine preceded pharmacy in the realization of the inadequacy of the courses and gradually lengthened them to their present proportions. Pharmacy delayed its educational development until the insistence, perseverance and logic of its leaders convinced the rank and file of the imperative necessity of a substantial advancement of educational and practical standards.

Next year all colleges of pharmacy will follow the example of our own college and go upon a minimum four-year basis. Admission to practice requires another year of good practical training and experience, making a total of five years against the seven years required by medicine. Graduation from pharmacy courses will no doubt be advanced to a five-year minimum soon. The present four-year course includes the equivalent of one year of academic work, the first year of the Junior College, but many of the students of pharmacy voluntarily complete the full two years of the Junior College as a preparation for three years of technical pharmaceutical study.

Fifty per cent of recent matriculants at our own College have such preparation, and last year they petitioned for a higher degree, or for the advancement of graduation to five years on the two and three plan; that is, two years of academic and three years of technical study. If the latter alternative were granted, the difference in length of study years between medicine and pharmacy would be brought down to a single year in favor of medicine.

There is a possibility, indeed a probability, that pharmacy will advance itself fully to the medical educational standard in the not remote future. Such equality of educational standards exists in the older countries. If there is justification for such equality elsewhere, then there is justification for it in this country. Many pharmacists, and some physicians of European birth whom I know, advocate such parity. They also advocate legislation here similar to, or identical with, that of the continental European countries, restricting the number of pharmacies to population.

The usual ratio is one pharmacy to a minimum of ten thousand population. The interests of the public are no less in this country than elsewhere and a fuller and more general realization of that fact may advance pharmacy here soon to the position it occupies in most other countries where the pharmacists are the equal in public estimation of the physicians and the ministers. To arrive at that equality American pharmacists must advance their educational and practical standards still further. Leading pharmacists in increasing numbers are becoming aware of this necessity and are working toward the higher standards that will insure the parity.

Physicians can help the pharmacists in this laudable effort, because the more highly trained the pharmacists are, the better is the service the physicians can give, since the utmost in pharmaceutical service is needed to make the utmost in medical service possible. Physicians generally agree fully with this contention. Their agreement should become dynamic through co-operation with the leading pharmacists who are pointing the way toward the higher standards for their calling. Some physicians will not co-operate because they do not want the pharmacists to be their equals. Some physicians honestly believe the pharmacists do not need greater efficiency. Still others believe pharmacy has become so overcommercialized that it will never become more or wholly rehabilitated professionally.

The right-minded pharmacists certainly believe in the proposed higher ideals, but there is a goodly number of undereducated pharmacists, and some who place the emphasis upon the trade side of their dual activities instead of upon the professional aspect, who are indifferent to advancement of professional ideals or actively oppose them. However, the great majority of physicians and pharmacists are earnestly and sincerely interested and many are actively engaged in forwarding and elevating standards, and it is these who through understanding, mutual good will and co-operation can and do advance the two callings to still nobler ends. They recognize each other's faithfulness and responsibilities and devotion to professional ideals, and earnestly and willingly unite their abilities and service for the greater welfare of the sick.

The matter of the details of this greater co-operation, time forbids me to indicate now. It could well be made the subject of a separate lecture. This mutual work is best forwarded by the individual pharmacists and physicians who are associated in their own towns or vicinities, by personal contacts and by particular circumstances and requirements. Indeed I feel the details of co-operation can safely be left to physicians and pharmacists without suggestions from me. The important thing is a mutual willingness to co-operate and a determination to be mutually helpful as occasions arise, and so I close this part of my address with the observation that co-operation between those present is assured because their willingness to that end is attested by the purpose that prompted this joint meeting of physicians and pharmacists.

I feel I should now discuss the U. S. Pharmacopoeia and the National Formulary, those two all important medical and pharmaceutical standards with which both professions should be intimately familiar. Because I have not found the time to reduce to writing what should be said about these basic works, I will proceed extemporaneously and if time and your patience permit, will touch upon other matters pertinent to this occasion.

Additional topics discussed by the speaker: U. S. Dispensary, The New Recipe Book, Pharmacology in Medical Schools, Christian Science in its Relation to Medicine, Kinds of Drug Stores, Detailing the Physician, Pharmaceutical Current Literature, Recent Developments in Pharmacy.

## THE ETIOLOGICAL RELATIONSHIP BETWEEN CHRONIC GASTRIC ULCER AND GASTRIC CARCINOMA

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It is the purpose of this paper to make a fairly comprehensive review of the literature on the relationship of gastric ulcer to gastric cancer, thus assisting in keeping alive before the profession a subject which we consider of especial importance. Areas of chronic irritation, like chronic ulcers, are prone to become carcinomatous and, on the other hand, carcinomata tend to ulcerate. Just which of these two factors predominate in the stomach is the question under consideration. Of the one-hundred-thousand cancer deaths annually, about one-third are carcinomas primary in the stomach. Some authorities estimate a high percentage of these arising in chronic gastric ulcer. Such men as William Mayo ('07), Louis Blanchard Wilson ('09), MacCarty ('14), Frank Smithies ('15), Wilensky and Thalhimer ('18), James Ewing ('18), F. Torek ('18), Cabot and Adie ('25), Henry Dible ('25), Alvarez ('28), Truesdale ('28), Harris ('28), and J. Shelton Horsley ('29) have written extensively on the subject and have done much to make the rest of the profession take a greater interest in all phases of the question.

A considerable number of surgical writers go on record as declaring that there is a definite relationship between chronic gastric ulcer and gastric malignant disease. They estimate the percentage of frequency all the way from zero to one hundred per cent. Since the etiology of gastric ulcer and of gastric cancer are both unknown, the study of their possible relationship becomes a matter of great difficulty except from the standpoints of history taking, gross and microscopic study of specimens and statistics in general.

As seen in table one, Cruveilhier ('39), was the first to state that simple ulcer of the stomach might change into cancer. However, the following year, Rokitonsky ('40) found gastric cancer which he thought might have developed from ulcer. In 1849 he first expressed the view that hemorrhagic erosions established the bases for a subsequent ulcerative process and reported seventy-nine cases. This view is now the modern one.

A few years later, Dietrich ('48), while examining 160 cancers, found two cancers which were developing inside ulcers and limited to portions of

TABLE 1

Giving the percentages of gastric ulcers that become carcinomatous and the percentages of ulcerating carcinomata that are carcinomatous from the start.

Authors	Year	Gastric ulcers that become cancer			Cancers that ulcerate and have been malignant from the start	
		Yes or No	No. of Cases	Per Cent	No. of Cases	Per Cent
Cruveilhier .....	1839	Yes	.....	.....	.....	.....
Rokitonsky .....	1840	Yes	.....	.....	.....	.....
Dietrich .....	1848	Yes	160	6	.....	.....
Sebert .....	1878	Yes	.....	9	.....	.....
Houser .....	1890	Yes	41	12	.....	.....
Zenker .....	1892	Yes	.....	100	.....	.....
Duplant .....	1898	No	8	0	8	100
Futterer .....	1902	Yes	.....	3	.....	.....
Mayo-Robson .....	1904	Yes	.....	59.3	.....	.....
William Mayo .....	1907	Yes	69	54	.....	.....
Verse .....	1907	Yes	.....	.....	12	100
Wilson and MacCarty.....	1909	Yes	109	71	.....	68
Smithies .....	1913	Yes	239	41.8	182	32.1
Payr .....	1914	Yes	.....	26	.....	.....
MacCarty & Broders.....	1914	Yes	472	69	.....	.....
Ewing .....	1918	Yes	.....	5	1	.....
Wilensky & Thalhimer....	1918	Yes	48	5	7	14.6
Dible .....	1925	Yes	.....	6	.....	.....
Cabot and Adie.....	1925	Yes	56	10	.....	.....
Scott .....	1928	Yes	3	20	3	100
Horsley .....	1928	Yes	.....	20	.....	.....

ulcers. He found six others developing near ulcers. In 1878, Lebert calculated that nine per cent of gastric cancers arose from ulcers, and Zenker ('82) took the extreme position and stated that all gastric cancers are secondary to some form of ulceration. Five cases of cancer following ulcer were described in 1890 by Houser, who also pointed out that hydrochloric acid may frequently persist in such cases.

Trifier ('98), advanced the theory that carcinomatous ulcers of the stomach resembled rodent ulcers of the skin. He thought they were slow-growing carcinomata with a pronounced tendency to ulcerate. After considerable study, Futterer ('02) concluded that pyloric ulcer frequently gave rise to carcinoma, especially in portions of the ulcer most exposed to irritation. Mayo-Robson ('04) concluded that 59.3 per cent of all his gastric cancers gave a history suggestive of ulcer, but could actually demonstrate the change in only one case. Payr ('14), studied serial sections of callous ulcers and found cancerous changes in twenty-six per cent. The reports from the Mayo Clinic indicated that seventy-one per cent of their gastric cancers were associated with ulcers and that there were carcinomatous changes in sixty-eight per cent of their ulcers. Alvarez and MacCarty ('28) said

that any chronic gastric ulcer with a crater more than 2.5 cm. in diameter was probably the seat of cancerous change irrespective of its age.

This opinion, however, has by no means been accepted by everyone. Wallman ('68) and Meyer ('74) stated that carcinoma originated in ulcer only rarely. Duplant ('98) studied eight cancerous ulcers and concluded they were all cancers, and that cancer never developed in peptic ulcer. Kuttner ('10) stated that he had never observed the transformation of ulcer into cancer, but regarded the majority of callous ulcers as being originally cancers. Aschoff ('12) stated that while the transformation of ulcer into cancer may occur, it is not nearly so frequent as has been stated. Anschutz ('12) could not be convinced that ulcer slowly brings on malignancy. Spilsbury ('22) said that the Mayo criteria for cancer arising in chronic ulcer were too liberal. T. Henry Dible ('25), after an exhaustive study extending over a period of five years and covering the examination of 600 slides and 170 specimens, concluded that cancer might develop upon ulcer in about six per cent of cases. Stall, Greenfeld and Berthold (cited by Ewing), reported on 500 ulcers of which only thirteen showed cancer, and in three of these the ulcer and cancer were not connected.

It is thus seen that on this question there is a great variance of opinion among authorities running from about two per cent to seventy per cent, with one observer putting it at one hundred per cent. It is natural for one to wonder why such a difference of opinion should exist. The crux of the matter seems to be a lack of uniformity of pathological rules as to what constitutes malignancy or a premalignant condition. Spilsbury ('22) took definite issue with MacCarty ('10) and stated that too much attention had been paid to isolated epithelial cells buried in scar tissue at the base of the ulcer. Ewing ('18) stated that MacCarty used inflammatory hyperplasia and misplaced glands as evidences of cancerous degeneration and pre-cancerous conditions contrary to present theories of pathology. Dible ('25) was in perfect agreement with Ewing ('18), Aaron ('21) and Spilsbury ('22). Furthermore, Kocher (quoted by Aaron) stated that he personally had examined the Mayo specimens and was convinced that there was much confusion between atypical epithelial proliferations and carcinomatous degeneration.

The same etiology may not, and probably does not bring about all chronic gastric ulcers. It is well known that extensive external burns will cause ulcerations of the gastric and duodenal

mucosa. O'Shaughnessy ('31) produced acute gastric ulcers and also typical chronic gastric ulcers by injecting histamine into the muscular coat of the stomach. He thought that his experiments seemed to correlate the numerous methods that have been used to produce gastric ulcer experimentally. Histamine, being a product of protein disintegration, and being produced by dead bacteria as well as by dead tissue, may be the common factor present in the different processes that are supposed to produce gastric ulcer clinically.

The relative importance of clinical data is gone into fully by Smithies ('13), who took the following symptom-complex to define ulcer clinically: "A form of gastric malfunction occurring usually between the ages of ten and seventy years, characterized by periodic or continuous abdominal pain or discomfort, frequently bearing definite relation to the ingestion of food and often associated with epigastric or dorsal tenderness, vomiting, loss of blood and with hyperacidity." He also defined the primary cancer symptom-complex clinically as follows: "A form of gastric malfunction of a downwardly progressive nature, usually occurring in persons between the ages of forty and seventy years who have previously been normal gastrically, the imperfect function being characterized by abdominal distress or pain, usually associated with cachexia, loss of blood, epigastric tumor, vomiting and with gastric contents revealing defects, low free hypochloric acid, presence of organic acids and of foreign microorganisms."

These two symptom-complexes are very good descriptions, and yet, if they are compared point for point, it will be seen that there is nothing absolute in either one. The various clinical symptoms might apply either to cancer or to ulcer. Even the important finding of epigastric tumor is not absolute. I well remember one day when my preceptor intended to resect a pyloric tumor. He opened the abdomen, found the tumor and held it in his hand estimating its possible extent so he could resect it properly. All at once it disappeared. The hard nodular tumor just softened and relaxed as it lay in his hand. It was a pylorospasm. The mysteriousness of pylorospasm was also commented on by William Mayo ('07). Likewise, we all have seen patients who had lost twenty-five pounds or more in weight and who were anaemic and cachectic get well under ulcer treatment.

Then there is the question of hyperacidity and anacidity. I have often observed that hyperacidity is present in strong, vigorous persons with

relatively young ulcers. After having been present for some time—a few years—the degree of hyperacidity often gradually decreases, reaches normal and finally dips below normal. Whether or not it finally results in anacidity I am not prepared to state, but there is more than a probability that in certain cases it does. At least the degree of acidity present is only relative and is not a sure index of the condition of the lesion causing it. Finally, it is well known that anacidity is often found in non-cancerous patients.

In no way do I mean to belittle Smithies' definitions nor to disagree with him, but I do mean to point out that the value of clinical symptoms is only relative and that the final diagnosis depends on microscopic findings. Cabot ('25) stated that "There are those who say that any patient with gastric symptoms may be made to give practically an ulcer history by the clever presentation of leading questions. And there is always the possibility of a typical gastric ulcer history really being that of a duodenal ulcer." Finally, it is well to bear in mind the three cases of Scott ('28), which showed symptoms of gastric ulcer for many years and which all proved to be cancerous. In one of these cases, with ulcer symptoms of twelve years' duration, an adenocarcinoma was found in the margin of the ulcer. In the other two cases the carcinoma was found in the base of the ulcer; clinical symptoms in the one had existed for five years and in the other for thirty years.

TABLE 2

Giving the percentages of gastric ulcer and of gastric carcinoma in the various regions of the stomach. (Statistics on ulcer taken from 3000 cases reported by Sippy and statistics on carcinoma computed from data given by Welch in his report on 1300 cases.)

	Pylorus	Lesser Curvature	Post. Wall	Ant. Wall	Greater Curvature	Fundus	Cardia
Gastric ulcer	12.0	35.0	30.0	9.0	3.5	3.0	6.5
Gastric carcinoma	60.84	11.7	5.2	2.3	2.6	1.4	8.0
Cancer involving the whole stomach.....							4.7%
Multiple cancer of the stomach.....							3.46%

Table 2 shows the percentage of frequency of gastric ulcer and of gastric cancer in the various locations of the stomach. The statistics on ulcer comprise three thousand cases reported by Sippy, while the statistics on cancer were computed from thirteen hundred cases given by Welch. It is seen that chronic gastric ulcer is most commonly found on the lesser curvature, the posterior wall and at the pylorus, in the order named. Gastric carcinoma is found most frequently at the pylorus, the lesser curvature and the posterior wall in the order named. At first sight it might seem that there was considerable discrepancy between the two sets of figures. William Mayo ('07), however, found no such discrepancy. He

stated: "The topography of gastric ulcer and of gastric cancer is the same. Eighty per cent of gastric cancers originate in the pyloric end of the stomach." It will be seen on table 2 that if the percentages given for cancer and for ulcer, respectively, at the lesser curvature, the posterior wall and the pylorus are added up, the respective results will be practically identical, being eighty-seven per cent for ulcers and seventy-seven per cent for cancer. Since the various divisions of the stomach, as given in table 2, are more or less arbitrary at best, the added percentages, as given above, are probably truer indices of conditions as they are, and they correspond with each other surprisingly well.

The great majority of writers place the question distinctly in the field of pathology. But the pathological rules whereby a certain ulcer is to be adjudged simple or malignant have not been definitely agreed upon. The interpretation to be placed upon inflammatory hyperplasias, misplacement of gastric glands, destruction of muscularis mucosae, destruction of the muscle coat, isolated epithelial cells buried in the scar tissue of the base of the ulcer, the existence of endarteritis obliterans and of extensive fibrosis are too broad. There is no general agreement among pathologists as to their meaning.

The pathologist has to render a verdict, but when he is asked whether or not a certain carcinoma followed a chronic ulcer or whether or not the crater is an ulcerating carcinoma, then indeed, is he asked to give a difficult decision. He is accustomed to be guided by the membrina propria. Simple lesions are limited to the mucosal side, and only malignant lesions are supposed to break through. And yet chronic ulcers commonly break through, not only the membrina propria but also the muscular coat, and down to and through the serous coat.

Furthermore, a diffuse round-cell carcinoma often arises in glands with intact membrina propria. A further most important confusion arises in the fact that a deep ulcer, in healing, contracts at its base, as shown by Dible ('25) and Jordan ('29). This contraction of the ulcer base distorts the tissue, and epithelial downgrowths and epithelial islands may be seen enclosed in the scar.

These epithelial downgrowths and islands form one of the main controversies of the whole question. William Mayo ('07), Wilson and MacCarty ('09), and Smithies ('13), all found high percentages of their ulcers becoming carcinoma-tous. They all classified ulcers, the bases of which showed epithelial islands and epithelial down-

growths, as malignant or pre-malignant. Ewing ('18), disagreed with these findings as did Spilsbury ('22), who stated that the Mayo criteria of isolated cells detached from the regenerating epithelium and buried in the fibrous tissue are not necessarily correct. Dible ('25) agreed strongly with Ewing and Spilsbury. Dible stated that he found such epithelial displacements in 32 per cent of his cases. He also found them in completely healed ulcers and in hour-glass constrictions due to ulcer. He thought they were due to the fact that epithelium heals faster than muscle and therefore tends to dip down into the crevices of any surface which it is covering, and he considered that they were signs of normal healing rather than a carcinomatous change.

Dible made a plea for the uniformity of pathological rules, and gave the following three rules as pointing unmistakably to the pre-existence of ulcer in a carcinoma: (1) the extent of muscular destruction, (2) the existence of extensive fibrosis, and (3) the presence of endarteritis obliterans or of vessels containing organized thrombi. He further stated that the downgrowths of epithelium that had broken through the muscularis mucosae took a good mucin stain indicative of a functional as well as a proliferative activity. These indications, as well as a stroma rich in plasma cells, he regarded as characteristic of normal healing in simple ulcer. The existence of extensive fibrosis and of endarteritis obliterans were, in his opinion, also compatible with simple ulcer.

Interesting food for thought was given by Montrose T. Burrows and Blair Bell (both cited by Horsley), who thought that the separation of the cell from its normal source of nutrition, and a stagnation of its surrounding fluids in which the by-products of the cell accumulate, might incite the dissociation of the cell from its controlling influences. The epithelial islands which Dible viewed with complete composure, Bell regarded much more seriously. He stated that the early cancer cell de-differentiates and lives by splitting glucose and not by oxidation. In this way the cell may acquire a power of independent growth and may be able to transmit this power. The downgrowths of epithelium imbedded in the fibrous tissue of the base of the healing ulcer may, due to this environment, start to split glucose and change to a malignant form. Furthermore, these changes may be limited to persons of advanced age, as was brought out by Ewing ('18), who stated that the transformation of ulcer into cancer might be limited chiefly to subjects well advanced in years.

The above theories of Burrows and Bell find confirmation in the work done by Dickens and Simer ('30) and by Dodds ('31). Dodds stated that when respiration is suppressed, it is found that the glycolysis of normal tissue rises towards the anaerobic level and that glycolysis is very much greater in malignant tissues than in the majority of normal tissues. He stated further that tumor tissue, under anaerobic conditions, will produce very large amounts of lactic acid from glucose, even up to 10 per cent or more of its weight per hour. He was certain that there is very definite damage to respiration in the malignant cell. Dickens and Simer ('30) felt much the same way. In their opinion, malignant tissue has a much lower respiratory quotient, and this defect in respiration was in connection with the oxidation of carbohydrates. This low oxidation of carbohydrates in tumors was not changed by the addition of insulin to isolated tumor tissue. It may seem from the foregoing that lactic acid in gastric contents might be a specific sign of malignancy and that it might be caused by the splitting of glucose. The tendency in England has been to consider it so. Dodds ('31), however, tested the lactic acid by polarimetric methods and found it to be the inactive variety. In other words, it was due to fermentation.

When normal tissue has become malignant, one of its characteristics that changes, is its power of absorption. Child ('15) showed that cancer cells, being young undifferentiated cells, have a greater power of absorption and will be affected by poisons before normal tissue cells. This may well explain the fact that some carcinomata ulcerate and become digested in part or in their entirety. The most difficult part to become digested seems to be the peripheral ring of tumor tissue bordering the crater and protected by the overhanging margin of mucosa.

Ewing ('18) stated in his conclusions that: "Gastric digestion may strip a primary carcinoma down to the muscularis or deeper, leaving no trace of carcinoma over most of the base but only a peripheral ring of tumor tissue which is protected by the mucosa." It seemed to be his opinion that the stomach wall is protected from the digestive juices by the mucosa, and, that when the mucosa is broken through, the digestion of the underlying tissues becomes easy. From the above it may be seen that Ewing believes firmly that a carcinoma may be digested by the gastric juices, leaving an ulcer as the end-result of the digestive process. His final conclusion was that the carcinomatous transformation of ulcer probably did not exceed 5 per cent.

His opinion found considerable substantiation in the work of Verse ('07), who carefully examined twelve cases of small carcinomata, some of them only local mucosal thickenings. One of his cases in particular, was of great interest. Numerous sections through the ulcer showed it to be nonmalignant. Yet sections through an adjacent lymphnode showed undoubted carcinoma. He stated that here was a gastric carcinoma that had already metastasized, had then ulcerated and had been subsequently entirely digested. Ewing also reported a similar case. Wilensky and Thalhimer ('18) described two such cases and mentioned several others, and Scott ('28) made the same observation. A summary of these data is given in Table three.

TABLE 3

A group of microscopically simple ulcers flanked by microscopically malignant lymph nodes.

Authors	Year	No. of Cases Reported	Microscopic Appearance of Ulcer	Microscopic Appearance of Flanking Lymph Nodes
Verse .....	1907	12	Simple	Malignant
Ewing .....	1918	1	Simple	Malignant
Wilensky and Thalhimer .....	1918	2	Simple	Malignant
Scott .....	1928	3	Simple	Malignant

The importance of the observations of this small group of writers listed in Table three is great. They define at least a certain group of ulcers as having been originally carcinomatous. The adjoining carcinomatous lymphnodes are positive proof of this. These completely digested carcinomata were all small, and hence these data seem to fit in nicely with the observations of Alvarez and MacCarty ('28), that the larger a gastric ulcer is, the more certain it is of being carcinomatous. They stated that gastric ulcers larger than a quarter are so rarely encountered that the physician with an average practice may go several years without seeing one. There was only one chance in ten, they said, that an ulcer smaller than a quarter was already cancerous. If the size is of one-half dollar, the chance of its being cancerous is two to one; while if its size is that of a dollar, it is almost certainly a cancer. It was their experience, at the Mayo Clinic, that twenty-three per cent of the resected carcinomata was within the range of size of benign ulcer.

#### CONCLUSIONS

1. A large group of writers on this subject state that chronic ulcers of the stomach may become carcinomatous. The majority give the percentage between five and fifteen per cent.

2. Several independent workers have reported a number of chronic gastric ulcers that were simple ulcers microscopically and yet were flanked by carcinomatous lymphnodes, proving conclusively that these ulcers were carcinomata from the start but were digested by the gastric juices.

3. The pathological rules upon which chronic gastric ulcer and gastric cancer are decided are too indefinite. A concise set of rules is needed. These rules should be agreed upon by pathologists generally and should determine, without question, the microscopic appearance of gastric malignancy.

4. In evaluating the importance of epithelial downgrowths and islands of epithelium from the standpoint of malignancy, due regard must be given to the fact that this aberrant epithelium is in a strange environment and its oxygen supply has been decreased. There is considerable evidence to prove that, when cells no longer live by oxidation but start to spit glucose, they are approaching malignancy. Furthermore, this tendency to spit glucose may be inherited by the daughter cells.

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## A ROMANCE OF PATERNALISM\*

WALTER F. DONALDSON, M.D.

PITTSBURGH, PENNA.

Tom Jones and Paul Smith, each aged twenty-one years, graduated together from a Pennsylvania college in June, 1918, and immediately enlisted for service in the World War. They remained in separate training camps in the United States, and were honorably discharged in improved health in December of the same year.

Jones entered a broker's office, and ten years later, at the age of thirty-two, was prosperous and in good health, except for an epididymitis, which developed in 1930 after an ardent but ill-fated affair with a woman of easy virtue. Smith entered medical college in 1919, and after the necessary five years of preparation and two additional but voluntary years of hospital training, began practice in his home town, and in 1930 was chosen to be the genito-urinary surgeon on the staff of the local general hospital.

Broker Jones consulted Dr. Smith, his former comrade in arms, regarding his infection, and Dr. Smith advised an operation, to be performed at the home town hospital, and plans were made accordingly. But an enthusiastic former comrade, with a political slant toward special benefits, hearing that Jones was hospital-bound, reminded him that a vote-seeking group of congressmen had recently successfully piloted through Federal legislation providing free hospitalization and treatment for all former soldiers, regardless of their ability to pay or the relation of their disability to their war service. So, prosperous Jones, with his impairment received in an *affaire d'amour* eleven years after his discharge from the army, was transported, at government expense, to and from a distant government hospital, while Dr. Smith chalked up another fee lost, and the local hospital another empty hospital bed, to the absolutely unfair paternalistic competition of Uncle Sam.

Who provided the cash to pay for Broker Jones' free transportation, free hospitalization, and free treatment? His former comrade Dr. Smith, his neighbors who maintain the hometown hospital, and others who pay a Federal income tax. Approximately 15,000 of the approximately 30,000 World War soldiers at present in recently built, but frequently unnecessary government hospitals, are being treated for ailments in no way related

to their army experience, and without consideration of their financial ability to pay the charges of hospitals and physicians adjacent to their places of residence.

Was Jones, during his convalescence at the hospital much in contact with other patients—the much honored and worthy beneficiaries of a grateful government? No! Those today in government hospitals surviving wounds and sickness or disease actually related to war or camp service number but 15,000, and they are often segregated from the other 15,000 at present in government hospitals, who, like Jones, are receiving free treatment for ailments in no way related to their army experience and without consideration of their ability to pay for treatment nearer home. So, in company with other country club members, who are convalescent from tonsil or appendix operations, or from an attack of gout or “nineteenth hole” neuritis, Jones whiles away a prolonged period of convalescence criticizing the wise president of the United States, who successfully obstructed the passage of legislation designed to extend the same economically unsound free hospital benefits to all the members of the families of former soldiers. Of course, Jones and the others wondered when an ungrateful government would include free clothing and free shoes, or begin to transport its indolent heroes to free hospitals built in Hawaii or Porto Rico, rather than to those only 2,000 miles away from home.

After a stay in the hospital three weeks longer than necessary had Jones been paying for it (it is difficult to find enough patients to fill the beds in many of the government hospitals), Jones returned to his home town, where for a long time he “grouched” about the quality of the free service he received from a bureau-controlled government hospital.

In the meantime, Dr. Smith having aroused the interest of his fellow Federal income-taxpayers on the board of directors of the local hospital, as well as in the county medical society, is, or should be, endeavoring to convince his congressmen and the senators from his state that the Federal government must respect certain fundamental principles of “states' rights,” and abandon its policy of providing free medical and hospital care, and financial relief for war veterans, except

\*Read before the Tristate Conference, Philadelphia, May 23, 1931.

for impairments which can reasonably be related to war service, or for the veteran who is unable to pay for treatment. Dr. Smith contends that since physicians represent the first group of citizens whose economic welfare is seriously threatened by this form of paternalism, and since they compose one of the few remaining individualistic professions, it is the duty of physicians to become politically conscious and to take the lead in fighting for recognition of "states' rights" and for discontinuance of Federal interference.

Those of us who retain knowledge of the meaning and relation of such Victorian words or terms as "pork barrel," and "rivers and harbors," to congressional raids on the Federal treasury, will no doubt agree that the large sums of Federal money spent in a congressional district to "improve" the harbor facilities of an erstwhile lackadaisical creek or river, or to erect a post-office building extravagantly large and ornate for the actual service requirements, pale into insignificance politically when compared with the patronage possibilities following upon success in landing a \$2,000,000 veterans' hospital for the "old home district." The initial investment may appear a paltry sum, but the annual budget and the political strength and patronage garnered in the influence of several hundred hospital employees in a congressional district may assure the fortunate congressman many terms in office. Therefore, the Veterans' Hospital Racket is here to stay.

Surely, those who pay taxes to the United States Government will not supinely continue to approve free medical, surgical, and hospital treatment of the disabilities of 4,500,000 veterans which originate as ordinary incidents of everyday life twelve or more years after the World War ended. Congressmen and senators who support such legislation must be rebuked at the polls, and the great majority of the veterans retaining their patriotic principles must repudiate the noisy minority who continue their raids on the public treasury.

An editorial writer in a recent issue of the *Outlook* ascribes the victory in the passage of the Johnson Bill to the "grasping element in the American Legion," and to "cheap politicians in Congress who will oblige any vigorous minority in order to be re-elected." The same writer describes the bill as: "A grab, a gouge—nothing more. Under the guise of providing for some meritorious borderline cases of disability, it opens the door for general pensions for everybody (4,500,000) who wore khaki during the World War.

"When the country adopted the War Insurance Act in 1917, it was assured that the scandals of the G. A. R. pension grab would never be repeated. When it granted the bonus, it was reassured again. The Legion itself went on record as opposed to general pensions. Yet, where are we now? Now we have a brand new method of granting money based on present-day accidents in civil life, and having nothing to do with the war."

With full knowledge of such facts, Calvin Coolidge said: "All countries on earth in all history, all put together, have not done as much for those who have fought in their behalf as our country alone has done since 1880."

It becomes hard for physicians to remember the earlier resolve to support every possible form of assistance to veterans, the victims of disease and injury resulting from war service, when we look on with righteous indignation while prosperous veterans are treated, without cost, at government hospitals, for civil life impairments such as enlarged tonsils, while vacant beds remain plentiful in home-town hospitals that are supported by the same citizens whose tax money also pays for the erection and maintenance of the already too numerous veterans' hospitals.

Apparently nothing can daunt the determination of the American Legion and other veterans' organizations in their relentless march toward bigger and better government aid for ex-soldiers. Following the recently enacted Federal legislation making available the cash bonus, will come the already-announced legislative program for immediate cash payments of all bonus certificates at their matured value. Who shall take the lead in developing resistance to this veterans' pressure, in shaming veterans out of such demands? If our younger men are taught that service to their country means that our Government thereafter much reward them, irrespective of their needs, then we are indeed undermining the very foundations of good citizenship. Veterans must develop and manifest a peace-time patriotism before the burden of pensions becomes intolerable.

Our Civil War pensions, instituted in 1879, amounted in the year 1919 to \$125,000,000, or four times as much as they were fifty years earlier. If, as was recently proposed by National Commander O'Neil of the Legion, the next Congress grants equality of pensions for veterans of all wars, then in a short time the Federal government will be paying out annually to its more than four million veterans more money than we spent while actually engaged in the World War. A Billion Dollars a Year!

Dr. Smith, while agreeing that our Federal Government should show every possible reasonable consideration to our war veterans, also emphasizes the fact that a larger proportion of physicians entered government service in 1917 and 1918 than from any other professional group. When the proposed forty-seven or more veterans' hospitals, each sustaining more salaried employees than patients, have been completed and occupied, then will "state medicine" have been thoroughly established throughout the United States, never to be displaced because of the political patronage involved. And when veterans or their relatives no longer abound, then will the free hospital service be extended to other citizens; and by 1960 the private medical practitioner and the neighbor-

hood hospital may largely have passed out of the picture.

Think it over, readers or hearers of this true story. Discuss it with your tax-paying neighbors, and with your congressmen. Any governmental policy which decreases the present-day attractiveness of medical practice to the intellectual type of mind, and causes men of ability to forsake it, is certainly against sound public policy. None can successfully deny, it is believed, that the Federal government, by the policy herein complained of, is in unfair competition with private physicians and the supporters of local hospitals who, in turn, are taxed to finance this paternalistic, bureaucratic form of medical and surgical hospital and dispensary practice.

## CLINICAL PATHOLOGICAL CONFERENCE

By E. T. BELL, M.D.

Department of Pathology, University of Minnesota  
MINNEAPOLIS, MINNESOTA

The Department of Pathology of the University of Minnesota conducts a course in clinical pathologic conferences. Cases are selected in which a thorough clinical study has been made. Many physicians have expressed interest in this type of study and therefore the Journal-Lancet is publishing a series of these conferences. The clinical data are taken from the hospital records and are given absolutely according to the data on the record. Following the clinical report a summary of the pathologic findings is given and a few comments are made on interesting features of the case.

### Autopsy—31—387.

Woman, 26, whose present illness began in September, 1926, with a dull ache in the right arm. The pain came in attacks, especially at night, and would keep her awake. In November, 1926, she noted some lumps in the right axilla. On December 1, 1926, she was unable to do her housework, largely because of pain in the left chest. A physician made a diagnosis of pleurisy at that time. First admission December 15, 1926.

Many enlarged, hard, discrete, movable lymph nodes in the right axilla and in the right infra- and supra-clavicular regions. The posterior cervical nodes were also palpable on both sides of the neck. Average diameter of the axillary nodes was about 1 cm. The spleen was not palpable. The liver edge was felt just below the costal margin. The blood pressure was 128/60. No loss of weight. Urine showed a trace of sugar; no albumin. Hemoglobin 77 per cent; erythrocytes 3,890,000; white cells 14,850; polymorphonuclears 82 per cent; lymphocytes 15 per cent; eosinophils 1 per cent; monocytes 2 per cent. Blood Wassermann negative. Biopsy of auxiliary node at this time. Temperature ranged around 101°. Patient was given X-ray therapy.

From this time until September, 1929, she was given X-ray therapy about once a month. Her general condition was fairly good. However, in September, 1929, after a course of X-ray therapy, she became quite ill

with vomiting, abdominal cramps, and diarrhea. She was confined to bed for three weeks at this time and lost about ten pounds in weight. About the end of October, 1929, she became moderately jaundiced with itching of the skin. She had repeated attacks of chills and fever at this time.

On a second admission, November 4, 1929, her temperature was 99.2°; moderate jaundice; pigmentation of the skin over the lower abdomen from previous X-ray therapy. Liver and spleen both palpable. Induration in the abdominal wall over the right rectus muscle. No lymph nodes palpable. Urine showed a trace of albumin. Blood: hemoglobin 69 per cent; anisocytosis; red blood cells 3,350,000; white cells 4,950; polymorphonuclears 68 per cent; lymphocytes 29 per cent; eosinophils 1 per cent; monocytes 2 per cent. Stools were clay colored. Icterus index 64. X-ray of the chest showed no infiltration in the lungs or mediastinum.

From this time on the patient had a low-grade fever, seldom above 101°. Toward the end of December, 1929, she began to complain of pain in the left hip; also occipital headache. The cervical lymph nodes became enlarged again. December 31, 1929, third admission, the jaundice was very slight. She was very weak and did no work; remained in bed part of the day; had nausea and diarrhea for one or two days after X-ray treatment over the abdomen. There was generalized

pigmentation of the skin, apparently resulting from X-ray treatment. There were a few enlarged nodes in the neck and in the axillae. There was an irregular tumor mass 7x7 cm. to the right of and below the umbilicus; it seemed to be deeply situated in the abdominal wall. The spleen and liver were palpable. Blood examination about the same as before. The urine was normal.

March 30, 1930, the patient became suddenly worse because of swelling and pain over the right and left lumbar region and difficulty of urination. She had chills and fever. Blood pressure 100/60. Very tender in the right lumbar region. Had to be catheterized frequently. The urine showed a trace of albumin and many casts and pus cells. The blood picture was about the same. Blood urea nitrogen was 25.2 mg. Temperature 101°. Icterus index 3. Severe pain in the back.

She was treated for cystitis and pus was drained from the tender area in the right lumbar region. An abscess developed on the back of the hand which required incision. The urine continued to show a trace of albumin. Secondary anemia persisted.

On the last admission, February 4, 1931, her condition was about the same as previously except that she was now much more emaciated and weaker. The incision in the right lumbar region still continued to drain; no signs of healing.

On February 21 she developed marked tenderness and rigidity of the lower part of the abdomen. The urine contained a moderate amount of albumin. There was severe abdominal pain and vomiting. Fever around 101°. She gradually became weaker and died March 3, 1931.

At the postmortem the body is markedly emaciated; generalized brownish pigmentation of the skin of the greater part of the body, presumably due to X-ray therapy. Large ulcerating lesion over the lumbar region. Generalized peritonitis with fecal material in the peritoneal cavity; perforation of the lower ileum (this perforation is probably due to X-ray treatment). The heart weighs 175 grams and shows no change except atrophy. There are extensive pleural adhesions. A few moderately enlarged glands in the mediastinum. The spleen weighs 250 grams and shows the appearances of Hodgkin's disease on section. Moderate enlargement of the retroperitoneal lymph nodes. The tumor in the right rectus region is a Hodgkin's infiltration. Marked diffuse amyloidosis of the liver; small amount of amyloid in the spleen and kidneys.

Microscopic examination of the various lymph nodes shows typical Hodgkin's disease.

Comment. This patient lived nearly five years after the onset of her illness. The lymph nodes were reduced by X-ray whenever they became enlarged and were not very prominent at postmortem. The intensive X-ray treatment probably caused the perforation of the ileum with resulting peritonitis. It is usually possible to control the enlargement of the lymph nodes by X-ray therapy in Hodgkin's disease, but the patient, nevertheless, dies of toxemia and emaciation.

Autopsy—31—419.

A woman of 28; the present illness apparently began in the early part of 1927 with enlargement of lymph nodes in the axillae and neck. She also had considerable itching of the skin at that time. A cervical gland was removed and examined in the spring of 1927 and she was given radium treatments after that. In the fall of 1927 she was poorly nourished and showed enlarged nodes in both sides of the neck and both axillae. The inguinal nodes were also slightly enlarged. She showed cyanosis of the lips and complained of dyspnea. The chest bulged considerably outward on the right and showed dullness and many moist rales over the upper lobe. The spleen and liver were not palpable. Scaphoid abdomen. Reflexes normal. Urine: trace of albumin. Blood pressure 110/75. Chest plate showed the heart displaced to the left; definite mediastinal mass to the right of the heart and extending above the heart. Hemoglobin 70 per cent; white blood cells 7,000. No evidence of leukemia.

She was given deep X-ray therapy over the medial, sternal, and axillary regions. The enlarged glands disappeared. The treatments were continued during 1927, 1928, and 1929, whenever a gland appeared. She was married in July, 1929. In the fall of that year enlarged left axillary nodes were noted again; these were given X-ray treatment. In June, 1930, she gave birth to a child, breech delivery. Came home from the hospital on the ninth day postpartum. On the tenth day she suddenly developed paralysis of one leg. The paralysis rapidly extended until she had a complete sensory and motor paralysis below the level of the third rib. She was admitted to hospital on June 16, 1930, at which time she had the paralysis described. The sphincters also became paralyzed. All reflexes were absent and the patient was unable to move her legs. A pericardial friction rub was heard. She was dismissed from the hospital about the end of June, 1930, and died at her home on March 10, 1931. She remained paralyzed all this time.

The postmortem showed a markedly emaciated woman with a very large gangrenous bedsore over the sacrum and coccyx. There were dense adhesions throughout both pleural cavities. Large nodules of solid fibrous appearance were found in both lungs; one of these extended into the thoracic wall. There were a few small abscesses in the lungs, also. The spleen weighed 300 grams and showed a small abscess and the appearance of acute splenitis.

The liver weighed 1,950 grams. The parenchyma was cloudy. The kidneys were cloudy. A diffuse fibrous tumorlike growth was found external to the dura at the level of the second and third thoracic vertebrae. This fibrous mass had compressed the spinal cord at this level very markedly. It did not extend through the dura but was adherent to the outer surface of this layer.

Microscopic examination of the tumor compressing the spinal cord, as well as the tumor masses in the lungs, showed typical Hodgkin's disease.

Comment. An occasional complication of Hodgkin's disease is the extension of the disease from lymph nodes through the intervertebral foramina into the spinal canal with resulting pressure on the spinal cord.

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*With neither hilarity nor gloom we stand, our backs to the dead past, that none can ever change.*

*Life is ever changing. Opportunities will come again, but they will not be quite the same.*

*Life has the quality, not only of change but of growth. We must be prepared then, for changed and greater encounters in the future.*

*We face new conditions and increasing needs, yet eagerly respond, because of the opportunities for service and growth that these afford. May it be in quality and the finer things of life.*

*With a true sense of responsibility, poise and tranquility born of confidence in the future, we step across the threshold of the changing years.*

*With outstretched arms, and a smile of pleasant anticipation, we welcome the new, and express to all our friends a sincere wish for a year of great happiness.*

ANENT "A ROMANCE OF PATER-  
NALISM"

Attention is called to an article in another part of this magazine entitled A ROMANCE OF PATERNALISM, by Dr. W. F. Donaldson, Secretary of The Medical Society of the State of Pennsylvania, which Dr. Donaldson has kindly permitted us to reprint here. He firmly believes that the facts set forth therein should in some form be brought to the attention of:

- (1) Every American Legion Post
- (2) The Trustees of every hospital (except State and Federal)
- (3) Every Congressman and United States Senator.

In each instance a copy of the action of the local county and state medical societies on the Resolution adopted by the Year 1931 House of Delegates of the American Medical Association should be included.

The Resolution referred to may be found in the *Journal of the American Medical Association* for June 20, 1931. Well worth reading also in this connection is the section entitled "World War Veterans' Legislation," in the *Journal* for May 2, 1931, and the editorial on this subject in the *Journal* for September 19, 1931.

Of yet more recent date, and also very comprehensive is the plan suggested in detail by Dr. H. H. Shoulders of Nashville, Tenn., in the *Bulletin of the American Medical Association* for October, 1931.

While in these and other discussions, reference has been made to the excessive demands of the Legion, against which demands such leading journals as the *Outlook* of New York have protested, credit now must be given both to President Hoover and to the Legion for their better accord at the recent Legion congress in Detroit.

Another unfavorable feature that has been developing in connection with this plan of compensation, free service, etc., is the tendency to try to trace back to war-time service, the beginnings

of some not very serious present trouble, with a view to establishing a certain ratio compensation. However, we presume there have been many physicians, even in our Civil War period and subsequent thereto, who have had experiences with really non-eligible persons trying to get money out of Uncle Sam and, of course, out of the taxpayers.

A. W. S.

### MEDICAL HIJACKERS

"Hijackers in Medical Work Are Assailed"—This was the head line in a local daily newspaper to a report of Dr. Allen B. Knavel's address as incoming President of the American College of Surgeons. Dr. C. Jeff Miller of New York was also quoted as having turned the "spot-light of criticism" on the profession as a cause of cost of medical service. It serves as an example of the way the medical profession is held up before the public.

While we admit it costs the patient more to be ill today, this is due, largely, to the cost of various refinements in treatment, such as hospitals for every one, special nurses when not absolutely needed, and laboratory services. The anxious family of the patient want all these things while the patient is ill, but grumble at the cost when he or she has returned home, either well, improved, or incurable. The physician does not try to ascertain whether these accessories are necessary or whether the patient can afford the luxury, but allows the feelings of the "anxious relatives" to influence his practice.

We all know of the tendency of "Group Medicine" as practiced in the Western portion of the country to "run the patient through the clinic." This is done partly to make the laboratory, physical therapy, and X-ray outfit pay their own ways and give the clinic the use of their services, the cost of which will be distributed over the whole grist of patients.

The truth is the doctor does not charge or receive any more for his personal services than he did a quarter of a century ago; his income is not any larger.

Now it would seem that a portion, at least, of the cost of medical care might be eliminated if each medical center or town having a certain number of doctors would maintain clinical laboratories, at public expense, that would furnish free to rich and poor alike at the request of any doctor such services as the patient might require. Such a clinical laboratory could be carried on as a

branch of the Public Health Bureau. There would be no incentive to the doctor to try to support a technician and laboratory for his own use, and his services would cost no more than usual. And the public would have no cause to think of the doctor as a "highway robber."

J. P. A.

### MEDICAL WRITING

The writing of medical papers is an important factor in a doctor's education. Every physician will profit himself by undertaking the labors of authorship. Osler said, "There is no more difficult art to acquire than the art of observation, and for some men it is quite as difficult to record an observation in concise and plain language."

An adequate report of an unusual case is of more value to the writer and to the reader than is any paper consisting largely of a rehash of the published literature, or of a hasty review of a series of poorly-studied cases. It is interesting that in some of the medical magazines of the nineteenth century many of the reports of cases are just as valuable pictures of a disease as are any of the modern descriptions. Sir William Osler drew attention to the report of a "Case of Schirrhous of the Pylorus of an Infant," made in 1788 by Dr. Hezekiah Beardsley before the New Haven County Medical Society, and said, "Every feature of the disease as we know it now is noted."

Subjects of interest to the profession are easily found in every practitioner's daily rounds; careful observations are a necessary part of his work; accurate notes can be made at the time with little additional effort; medical libraries may be visited in leisure hours—and every man has time to think, if he will.

In recording a case for publication, the haste that breeds carelessness should be avoided. Accurate observations stated in clear, concise, simple language and arranged in logical order will hold the attention of the reader. Painstaking revision of manuscript is the price to be paid for clear expression. Our best scientific and literary writers always make several drafts before submitting a paper for publication. Sir Clifford Allbutt says, "Slovenly writing is slovenly thinking, and obscure writing, for the most part, confused and unripe thinking." There are two small volumes every doctor will do well to have at his elbow: Allbutt's "Notes on the Composition of Scientific Papers" and "The Art and Practice of Medi-

cal Writing" by Simmons and Fishbein. The considerable experience of these authors will solve many problems.

Few of our fraternity will ever attain to the excellent workmanship of our best medical authors, but patient and conscientious effort can im-

prove our work immeasurably. Sir Clifford Allbutt gives us the kernel of the nut in this succinct sentence: "Force, lucidity, unity, simplicity, economy of expression are virtues which we may all attain; originality will be as God pleases."

H. M. N. W.

**NEWS ITEMS AND HEALTH ACTIVITIES OF  
NORTH DAKOTA STATE DEPARTMENT OF HEALTH**

A. A. Whittemore, M.D., State Health Officer, Bismarck, N. D.

Viletta Roche, Editor-in-Chief, Director of Bureau of Vital Statistics, Bismarck, N. D.

**Who's Who in Public Health in North Dakota**

Dr. Ribble is County Health Officer of La Moure County and is presented as the latest addition to Who's Who. He has just completed a program of immunization against diphtheria in which 700 children of the county have been immunized without any appropriation of county funds, through the co-operation of his fellow practitioners. Dr. Ribble was largely instrumental in procuring for his county, the services of a public health nurse who is supported by the Red Cross and County in conjunction. Besides being health officer, he has also served as coroner and president of the County Medical Association.



G. B. Ribble, M. D.,  
LaMoure, North Dakota

George B. Ribble was born at Detroit, Michigan, June 22, 1878. He was graduated from the high school at St. Peter, Minnesota, and after two years at Gustavus Adolphus College, he entered the University of Minnesota, receiving his Ph. D. degree in 1901 and his M. D. in 1904. He is a member of the Delta Tau Delta and Nu Sigma Nu Fraternities and is a very fine musician. He took his interne work at St. Luke's Hospital in St. Paul and there met Miss Georgia Neff, whom he married in 1906, having established his practice at La Moure the preceding year. Except for a brief time at Fargo, he has practiced medicine continuously at La Moure for the past 26 years. Dr. and Mrs. Ribble have three children, George, Jr., also a doctor; Helen, a teacher at the Valley City Teachers' College, and Philip, a student at the University of Minnesota.

A splendid health officer—a doctor of medicine in the highest sense of the word—we take real pleasure in presenting La Moure County's Health Officer, Dr. G. B. Ribble.

**Diphtheria Carriers**

In the control of diphtheria, as well as other carrier-borne diseases, the individual, whether he be a convalescent or not, who is determined to be a carrier of the disease, is of paramount importance. Many such individuals are unjustly submitted to, or kept under quarantine who are not carriers of virulent organisms of the disease. The virulent and avirulent strains of diphtheria bacillae have the same staining reaction and microscopical appearance and the virulent strain can only be determined by animal (guinea pig) inoculation. Inasmuch as but approximately 18 per cent of diphtheria carriers give a positive virulency reaction, it is suggested that physicians and especially health officers request our state public health laboratories for such an examination on all healthy carriers and convalescents who continue to give positive laboratory findings for diphtheria bacillae which service our laboratory system is rendering.

**Maternal Deaths**

There were 90 maternal deaths recorded with the State Health Department for 1930, an increase of 8 over 1929 and an increase in the rate of from 5.5 to 6.1. Most of these deaths occurred in March and July. The five highest causes in order of importance were: Eclampsia (28); sepsis (21); hemorrhagic (16); abortion (6) and ectopic (5). Four mothers were 18 years of age or under; 17 died in the age group 19-24; 43 were classed in the group 25-34, and 26 deaths occurred in the age group "over 35." Only one Indian woman died from maternal causes last year. Out of the 90 maternal deaths, 39 occurred in hospitals. 72 mothers were born in the United States, 11 in Russia and 7 in other countries. The maternal death rate is based on live births, that is, the rate 6.1 means 6.1 maternal deaths per 1,000 live births registered for the year. Therefore, if the maternal death rate of your county is higher than you think it should be, see that all of your births are recorded promptly. Five counties had maternal death rates over 10—too high.

**Grand Forks Goes Over the Top**

A plan of supervised milk control was approved by fifty Grand Forks dairymen and the city will adopt the Standard Milk Ordinance now in effect in over 500 cities in the United States. Valley City was the first city in North Dakota to adopt the plan

and Grand Forks is a close second. Inspection of dairy barns and pasteurization plants is required at least once a month under this plan, and four grades of milk are allowed.

The new \$250,000 water system which is to be put into service in Grand Forks this month has been inspected by the Health Department to see that the various units of the system conform to State Health service requirements.

#### Merry Christmas!

The State Department of Public Health extends its heartiest wishes for a Merry Christmas and a Happy New Year. The friendly spirit which is reflected in communications between physicians, hospitals and the Department is deeply appreciated and makes our endless work of collecting the health records of the state a satisfactory accomplishment. By this spirit of co-operation we are doing what some other states accomplish through prosecutions.

#### NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Dr. A. M. Smith will succeed Dr. H. W. Froehlich, as city physician at Thief River Falls, Minn.

Dr. T. D. Jones, formerly located at Bowdle, S. D., has moved to Aberdeen, and opened offices for general practice.

Dr. S. A. Slater, Worthington, Minn., was the guest speaker at a meeting of District Nurses held at Sioux Falls last month.

Dr. W. C. Stillwell, Mankato, Minn., has been elected president of St. Joseph's Hospital of that city with Dr. A. F. Kemp as secretary.

Dr. E. L. Claydon, Red Wing, Minn., has sailed for a sixty day tour of Europe. He is planning to spend most of his time in Russia.

An addition to the Veterans' Hospital at St. Cloud, Minn., at a cost of over \$500,000 is to be started in the early spring. It will add over 200 additional beds.

Members of the Board of Councillors of the South Dakota Medical Society held their December meeting at Huron, being the guests of the Huron Medical Society.

Dr. Hilding Berglund, head of the department of medicine in the University of Minnesota Medical School, was granted a long leave of absence by the board of regents.

Dr. Hugh S. Willson, a graduate of the University of Minnesota in 1904, and was in practice for 15 years at Minneapolis, died recently at La Jolla, California, aged 55 years.

A complete rest in bed is the best treatment in absence of vaccine or serum for influenza, according to a recent bulletin issued by the Minnesota State Medical Association.

Dr. R. H. Harrison, So. St. Paul, a resident physician of that city for over thirty years, died last month at the age of 70 years. He was a graduate of the Harvard Medical School.

Drs. S. Z. Kerlan and R. F. McHugh were rival candidates for mayor of the city of Aitkin, Minn., at the recent election, with Dr. McHugh being elected by a small majority of votes.

Dr. A. E. DeTuncq, who has been in active practice at Milbank, S. D., for nearly 15 years, died in Chicago last month, as the result of an operation. He was only 41 years of age.

Dr. J. R. E. Sievers, president of the Montana State Medical Society, is planning on several special meetings after the opening of the new year. They will be held at different cities throughout the state.

A new medical society has been organized at Tyler, Minn. Its membership will be confined to that county, and its objects are to become better acquainted and discuss problems that all are directly interested in.

Dr. Torsten Ohrbom, practicing physician at Menasha, Minn., must go to the Federal penitentiary at Leavenworth for three and one-half years for faking government morphine certificates and obtaining the dope for his own use.

Dr. Frank J. Heck, of the Mayo Clinic, was the principal speaker at the December meeting of the Northwest District Society held at Minot. Dr. Heck's subject was "Practical Points in the Treatment of Primary and Secondary Anemias."

Dr. Charles MacLachlan, superintendent of the State Sanatorium at San Haven, N. D., visited Toronto, Ont., as a personal representative of Governor George F. Shafer, to attend a meeting of the International Peace Garden Committee at the annual meeting held in that city.

The Washington (Minn.) County Medical Society held its annual meeting at Stillwater and elected the following officers: Dr. E. V. Strand, Bayport, President; Dr. D. Kalinoff, Stillwater, Vice-President; Dr. V. C. Thompson, Marine, Second Vice-President; Dr. E. S. Boleyn, Stillwater, Secretary-Treasurer.

The regular meeting of the Cass County Medical Society was held at Fargo last month. Dr. Olaf Sand, Fargo, presented a paper on "Bile Peritonitis." Following this was a demonstration of the audiometer by the Health Department as used for testing hearing among the school children and a report of the findings among 4,500 children.

Dr. B. F. Van Valkenburg, Long Prairie, Minn., was elected president of the Minnesota State Sanitary conference at its annual meeting. Dr. W. H. Valentine, Tracy, was named vice-president; Dr. A. J. Chesley, Minnesota State Board of Health, Secretary-Treasurer, and Drs. G. S. Wattam, Warren, and H. M. Workman, Tracy, were elected life members.

The 1932 meetings of the Minnesota State Medical Association and the Minnesota State Hospital Association will be held together May 23 to 25 in the St. Paul Auditorium. It will be the first time the two associations have convened together. The meeting will mark the seventy-ninth year of the medical body and the thirty-third of the hospital organization.

Dr. B. T. Bottolfson, Moorhead, Minn., physician, was re-elected president of the Clay-Becker Medical society at the annual meeting held in December. The group met for the semi-annual dinner and meeting. Dr. J. H. Heimark was re-elected secretary. A talk on "Liver Lesions" was given by Dr. M. W. Comfort of the Mayo clinic at Rochester. Physicians from Clay and Becker counties and Fargo attended.

The regular meeting of the Minnesota Academy of Medicine was held at the Town and Country Club last month with the following program: "Some Recent Observations Regarding the Nature and Treatment of Epilepsy in Children," Dr. Irving McQuarrie, Minneapolis; "The Embryology and Surgical Correction of Certain Renal Malformations," Dr. Frederic E. B. Foley, St. Paul.

Dr. John L. Rothrock, St. Paul, who has served for several years on the University of Minnesota faculty as associate professor in Obstetrics and Gynecology, has been advanced to a full professorship by the board of regents. Dr. Rothrock, recognized in the northwest as an outstanding authority in his field, has served without pay in the medical school. He has retired from active practice.

Dr. Louis W. Allard, Billings, Montana, surgeon, has been named to receive the papal decoration, Knight of the Order of St. Gregory the Great, in recognition of his work with crippled children. The decoration will be conferred at pontifical mass on January 6. Dr. Allard has devoted a number of years to caring for deformed children and as a hobby he has served as chief of staff for St. Vincent's orthopedic hospital school.

The Red River Valley (Minn.) Medical Association elected Dr. O. F. Melby of Thief River Falls president of the annual dinner and program meeting held at Crookston. Dr. H. H. Hodgson was elected Vice-President, and Dr. C. L. Oppegaard re-elected Secretary-Treasurer. Medical papers were read following the dinner hour and plans for the Northern Minnesota Medical Association meeting in Crookston during the early summer were discussed.

The Stutsman County Medical Association met at the North Dakota State Hospital, Jamestown, for their regular December session. The subject of the meeting was the treatment of syphilis by malaria and the address was given by Dr. John Regan of the hospital staff. After the meeting a lunch was served and election of officers was held. Dr. J. D. Carr was re-elected president; Dr. G. S. Carpenter, vice president, and Dr. F. C. Winn, secretary. There were about 20 physicians present.

Dr. C. P. Rice of Wahpeton, N. D., was elected President of the Richland County Medical Association at the regular meeting held last month following a turkey dinner which was served in the hospital auditorium. Dr. B. K. Kilbourne of Fargo was the principal speaker of the evening, giving a very interesting paper on "Infantile Paralysis," and demonstrated the muscle exercises which should be given following the attack in order to regain the use of the paralyzed muscles.

The annual meeting of the Camp Release Medical Society and Auxiliary was held at Granite Falls, Minn. Doctors in towns of this section belong to the medical society. The joint meeting was honored by the presence of Dr. V. L. Sogge, of Windom, president of the Minnesota State Medical Society, and Mrs. James Blake, of Hopkins, president of the State Auxiliary. Dr. G. H. Meeker, of Olivia, was named president of the Camp Release Society and Mrs. I. C. Adams, of Bird Island, was chosen president of the Auxiliary.

The annual business meeting of the Watertown District Medical Society was held at Watertown on December 8, 1931. Officers were elected as follows: President, Dr. J. H. Lockwood, Henry; Vice-President, Dr. A. E. Johnson, Watertown; Secretary-Treasurer, Dr. William Duncan, Watertown; Censors, Dr. H. Russell Brown, Watertown, 1934; Dr. A. H. Christensen, Clark, 1933; Dr. F. H. Staley, Vienna, 1932. During the meeting plans were discussed for the 51st annual session of the State Association to be held in Watertown in June, 1932.

Dr. Goldie Zimmerman, Sioux Falls, was elected president of the Sioux Valley Medical Society at the annual meeting recently held in that city. Dr. C. J. Hannon, Hartford, was elected Vice-President; Dr. C. William Forsberg, Sioux Falls, was re-elected Secretary, and Dr. E. S. Stenberg, Sioux Falls, was elected Censor. Dr. O. L. Hanson of Valley Springs was elected Delegate. The main talk of the evening was made by Dr. S. A. Slater, Worthington, Minn., who spoke on his recent tour of Europe from a medical standpoint. Dr. T. J. Billion also spoke on "Treatment of Hemorrhoids."

Dr. J. O. Threadgold, Belle Fourche, S. D., was elected president of the Black Hills Medical Society at a meeting held last month. Dr. N. E. Mattox, Lead, Vice-President, and Dr. Frieda Radush, Rapid City, was re-elected Secretary-Treasurer. Dr. J. L. Chassell, Belle Fourche, read a paper on "Rocky Mountain Spotted Fever," which was discussed by Dr. R. E. Jernstrom and Dr. F. S. Howe. Dr. N. E. Mattox read a paper on "Epidemics of Cerebro Spinal Meningitis," which was discussed by Dr. B. Jernstrom and Dr. F. L. Hummer. Dr. M. O. Pemberton reported on a case of tularaemia which was discussed by Dr. W. A. Dawley and Dr. Minty. Papers were followed by a general round-table discussion.

"Dr." A. L. Collen, who claims to be from Chicago, and who has been operating in Winona County for the past thirty days, has informed the County Attorney of Winona County that he prefers to leave rather than face a prosecution for violation of the Basic Science Law. Collen claims to be a Doctor of Chemistry. He has been calling on farmers and other people in the vicinity of Winona selling them various preparations for

stomach ailments, rheumatism and the like. When first interviewed Collen was very indignant over his being refused permission to operate in this state, his claim being that he was selling a medicinal preparation and could not be prosecuted for doing so. The Medical Board will appreciate hearing from any one who has information indicating that Collen is still operating in this state.

Dr. John Benson Brimhall, executive secretary of the Minnesota State Board of Medical Examiners from 1897 to 1901, died at his home in St. Paul, after a two months' illness. He was born in St. Paul in 1862 and was graduated from the University of Pennsylvania in 1890. The same year he opened an office in that city, becoming associated with Dr. Arthur J. Gillette, who was with him for more than 23 years.

Nineteen students at the University of South Dakota Medical School took the medical aptitude test offered by a national committee of doctors as an entrance requirement into practically all class A medical schools. The test includes scientific vocabulary, premedical information, comprehension and retention, visual memory, memory for content, and the understanding of printed material.

## SOCIETIES

### Sioux Valley Medical Meeting

The annual meeting of the Sioux Valley Medical Association will be held in Sioux City, Iowa, January 26 and 27, 1932. The headquarters will be at the Martin Hotel where all lectures, papers and dry clinics will be conducted. A comprehensive program has just been completed and includes lectures, dry clinics, papers and discussions by the following: Dr. C. A. Roeder, Associate Professor of Surgery, College of Medicine, University of Nebraska, Omaha, Neb.; Dr. Frank C. Neff, Head of Department of Pediatrics, University of Kansas Medical School, Kansas City, Mo.; Dr. Hillier L. Baker, Instructor and Surgeon at Rush Medical College, Chicago, Ill.; Dr. Walter C. Alvarez, Head of Department of Gastro Enterostomy, Mayo Clinic, Rochester, Minn.; Dr. Louis A. Buie, Associate Professor of Proctology, Mayo Clinic, Rochester, Minn.; Dr. Harry E. Mock, Associate Professor of Surgery, Northwestern University, Chicago, Ill.; Dr. Phillip Lewin, Chicago, Ill.; Dr. James G. Carr, Professor of Medicine, Northwestern University Medical School, Chicago, Ill.; Dr. Elmer L. Sevringhaus, Associate Professor of Medicine, University of Wisconsin Medical School; Professor A. J.

Carlson, Department of Physiology, University of Chicago Medical School; Dr. E. A. Doisy, University of St. Louis, St. Louis, Mo. In addition there will be exhibitions of sound motion pictures depicting surgical and obstetrical operations. There also will be a business session in connection with the annual meeting and election of officers will be held.

JOHN H. HENKIN, M.D., Secretary.

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### Fracture Symposium

On February 3 and 4, 1932, there will occur in Minneapolis a discussion of the modern treatment of fractures. This is being conducted under the joint auspices of the Minneapolis Regional Sub-Committee of the General Fractures of the American College of Surgeons and the Minneapolis Surgical Society.

On Wednesday evening, February 3, at 8 o'clock, in the Auditorium of the Hennepin County Medical Society, a symposium on the treatment of fractures will be held.

The program on Thursday, February 4, will be entirely under the direction of the Minneapolis Surgical Society in connection with its annual formal meeting. Dr. Kellogg Speed of Chicago, an outstanding authority on the subject of fractures, will be the guest speaker. At 10 o'clock, Thursday morning, Dr. Speed will conduct a fracture clinic with demonstration of cases at the Minneapolis General Hospital. At 3 P. M. he will lecture to the students of the medical school, and following the annual formal banquet in the Nicollet Hotel at 6 P. M. he will deliver an address before the society.

All members of the profession in good standing are invited to attend these meetings, including the banquet.

Reservations for the banquet must be made with the secretary, At. 5579, before Wednesday noon, February 3, 1932. Banquet tickets are \$2.00.

H. O. MCPHEETERS, M.D., Secretary-Treasurer.

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### Yankton District Medical Society

The annual meeting of the Yankton District Medical Society was held December 15, 1931.

The following officers were elected:

President—Dr. J. C. Ohlmacher.

Vice-President—Dr. Ina Moore-Freshour.

Secretary-Treasurer—Dr. J. A. Hohf.

Delegates to the State Convention—Regular: Dr. F. A. Moore, Dr. Thos. Cruickshank. Alternates: Dr. Lottie G. Bigler, Dr. F. J. Abts.

Doctor F. C. Smith's term of office on the Board of Censors expiring, Doctor H. Klima was elected to the position. The Board now consists of the following members:

Dr. G. S. Adams—Term expiring 1932.

Dr. Thos. Cruickshank—Term expiring 1933.

Dr. H. Klima—Term expiring 1934.

The scientific program consisted of the following:

Infectious Diseases of Children by Doctor Robert H. McBride, assisted by Doctor Joseph E. Dvorak, both of Sioux City, Iowa. Because of the recent epidemic of diphtheria in Yankton and Sioux City, the above Doctors' talks with lantern slides were confined wholly to the subject of diphtheria. It was a thorough going and complete dissertation of diphtheria.

Under the heading of Case Reports and Conference, Doctor F. A. Moore presented the clinical phase of an interesting case supplemented by Doctor J. C. Ohlmacher who gave the pathological.

Next was a report by Doctor F. J. Abts, giving a variety of experiences in connection with the recent diphtheria epidemic.

The attendance at this meeting was rather small, but it proved to be one of the most interesting meetings of the year.

J. A. HOHF, M.D., Secretary.

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### Sixth District Medical Society

The regular quarterly meeting of the Sixth District Medical Society was held Tuesday evening, December 15, 1931, at the Terrace Gardens of the Patterson Hotel. There were thirty-eight members and the following visitors present: Dr. A. P. Nachtwey, Dickinson, No. Dak.; Dr. L. J. Alger, McClusky, No. Dak.; Dr. L. H. Moyer and Dr. R. W. Allen, Bismarck, No. Dak.; Dr. Hubert Miller, Herreid, So. Dak., and Mr. Omett, Bismarck, No. Dak.

The following scientific program was presented:

1. Paper illustrated with lantern slides, "Tumors of the Neck." Dr. N. O. Ramstad and Dr. L. W. Larson, Bismarck.

2. Paper, "Cerebrospinal Meningitis with a Report of Twelve Cases." Dr. C. C. Smith and Dr. B. S. Nickerson, Mandan, No. Dak.

The annual election of officers was held and the following were elected:

President—Dr. O. T. Benson, Glen Ullin, N. Dak.

Vice-President—Dr. C. C. Smith, Mandan, N. Dak.

Secretary-Treasurer—Dr. L. W. Larson, Bismarck, N. Dak.

Board of Censors—Dr. P. L. Owens, Bismarck, N. Dak.; Dr. W. C. Wolverton, Linton, N. Dak.

With regard to members and the transfer of members, Dr. R. J. Stein, who was formerly at New Salem, N. Dak., has moved to Graceville, Minnesota. Dr. R. E. Graber of Bismarck, N. Dak., has moved to Stanley, Wisconsin.

Dr. E. P. Quain attended the recent meeting of the Western Surgical Society at Denver on December 4th and 5th where he presented a paper on "Non-operative Traction for Reduction of Certain Fractures."

Dr. L. O. Fox, who is in the Indian Service, has located at Fort Yates, N. Dak., and will take over the work on the reservation.

L. W. LARSON, M.D., Secretary.

## BOOK NOTICE

EXPERIMENTAL CHILD STUDY, Anderson and Goodenough. The Century Co. 1931. Part of the Century Psychology Series. Price \$30.00.

Two University professors, Florence Goodenough, Ph.D., and John E. Anderson, Ph.D., director of the Institute of Child Welfare, are co-authors of a text on methods and technique of conducting scientific study on young children which is intended for the beginning student of child development.

The authors are psychologists, well-versed in statistical methods and methods of collecting data. The book reflects the modern attitude in that it is frankly experimental rather than philosophical, and is unique in dealing entirely with methods devised for the study of the young child of preschool and early age. It contains full accounts of forty-one such experiments and serves as a guide for the gathering of data and its intelligent interpretation. In its writing, the authors have drawn heavily on the experiments and investigations conducted by the University Institute of Child Welfare, which has played an important part in the modern movement for child study. It is an excellent hand-book and guide for anyone doing research either in planning the study or in compiling of the material.

S. GOTTWERTH

The Practice of Medicine, by A. A. STEVENS, A. M., M.D. Third edition, entirely reset. 1150 pages, illustrated. Philadelphia, W. B. Saunders Co., 1931. Price: Cloth \$8.00 net.

The third edition of Stevens' Practice of Medicine is largely written on the same lines as the previous editions. It is the text book type, covering all of medicine in one volume. It is written by one man, but references to the general literature are generous and kept well up to date and are placed in foot notes. There are many new sections and much that has been rewritten.

The article on poliomyelitis mentions the use of convalescent serum and gives references to articles as late as 1929. In the article on chronic ulcerative colitis the discussion is short though fairly inclusive. Bargen's work on clinical findings is mentioned, but nothing said about his vaccines. The treatment of erysipelas by anti-toxin and by ultra violet light is mentioned. In the discussion of each disease the division of material is that made conventional and familiar in Osler's Medicine.

As a whole this is the type of book which is invaluable to students and which the practicing physician needs on his desk for rapid reference. There is, of course, no idea that it will take the place of a complete set of volumes, but as a ready reference it fills its place unusually well.

H. B. SWEETSER, JR., M.D.

## CLASSIFIED ADVERTISEMENTS

## Clinical Technician

Experienced clinical laboratory, X-ray and therapeutic technician desires position. Can do stenographic work. References. Available January first. Address box 884, care of this office.

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Experienced laboratory technician would like position in clinic, hospital or doctor's office. Experienced in X-ray and physiotherapy. Some nursing experience. Address Box 882, care of this office.

## Physician and Surgeon Wanted

Good North Dakota city of 700, no resident physician at present. Must be capable and experienced. Married man not over 40, Scandinavian preferred. No financial aid offered. Address Box 880, care of this office.

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Sublease unfurnished private office at busy intersection in Minneapolis. Share furnished waiting room with established dentist. Nothing to sell. Rent reasonable to responsible man. Address Box 881, care of this office.

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Graduate nurse and laboratory technician with six years' experience would like position in clinic or hospital laboratory. Experienced in all laboratory procedures including basal metabolism and physiotherapy. Address Box 879, care of this office.

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Excellent location with internist in outlying district of Minneapolis available for capable Rhinologist and Otolaryngologist. Write details of education, training, experience, references. Splendid opportunity. Thorough consideration and investigation invited. Address Box 883 care of this office.

## For Rent

Doctor's office occupied by prominent physician. Office elegantly equipped. Individual treatment room, laboratory, etc. Reception room is shared with dentist and other physician. A new up-to-the-minute medical building, located in one of the best business intersections of good residential district. This is an unusual proposition and must be seen to be fully appreciated. Address Box 877, care of this office.

## For Sale

Small rural hospital, all modern. Worth \$25,000.00, will sacrifice for \$16,000.00, instruments and equipment included. \$5,000.00 cash, balance terms. Address box 885, care of this office.

## For Rent

Modern physician's office for rent, joint reception room with busy dentist. Present physician going away. Located over busy drug store on busy corner of 26th and Central Aves. N. E., Minneapolis. Equipment optional; low rent for this excellent location. Call Ludwig W. Larson, Dinsmore 0522, Minneapolis.

# THE JOURNAL-~~L~~ANCET

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## IMPULSIVE BEHAVIOR IN CHILDHOOD DELINQUENCY\*

H. S. LIPPMAN, M. D.

Amherst H. Wilder Child Guidance Clinic,  
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An impulsive act is one that occurs without premeditation, in contrast to a voluntary act in which the individual knows why he behaves as he does. Conscious control and judgment are diminished and often absent in impulsive behavior. The child tends to act more impulsively than the adult. His instinctive demands are gratified, whenever possible, as soon as they present themselves; he yields to the impulse, if the result promises to be pleasant. By degrees he learns to accept social standards, and this involves, primarily, the checking of his impulses.

All children are not impulsive to the same extent. The restless, hyperactive child finds greater difficulty in inhibiting impulsive behavior than does the normal child. Those factors which are responsible for the restlessness are also responsible for his impulsive behavior. The secretion of the endocrines represents one of these factors; the reactions of the hyperthyroid individual, for example, are quite different from those of the cretin, in controlled as well as in impulsive movements. Mineral metabolism, especially that of calcium, is another factor. Fatigue, with its accompanying effect on behavior, needs more consideration. We will need to know much more about the physiology and psychology of the nervous system before we can be satisfied with our knowledge of why a child behaves impulsively.

Misbehavior resulting from impulsive action in the child is best illustrated in the post-encephalitic. In the typical case such a child appears to have few inhibitions. He will suddenly attack another child, appear to be genuinely sorry for what he has done, promise not to do this again, and almost before his promise has been made, repeat the act. Punishment does not produce the usual result; he cannot help himself. Among objective tests that reveal impulsive behavior, the Porteus Maze test is one of the best. The impulsive child suggests a route which leads into a closed space. He is blocked. He repeats the test and gets into a similar difficulty. He is unable to plan his approach, but rushes into the space without premeditation.

Recently, Bond and Appel<sup>1</sup> published a book which describes their experiences with post-encephalitic children in Philadelphia. Many of their very difficult problems became less troublesome after two or three years of careful supervision. The whole process of making these children social beings had to be gone through again, just as if they were infants. The claim has often been made that the uninhibited behavior of the encephalitic was due to the over-solicitude and protection of his parents because of the brain damage; however, such a relationship has not been found to exist, and in a personal interview with Bond in Philadelphia, he told me that he felt sure that the complicating behavior had very little to do

\*Read before the Hennepin County Medical Society, October 28, 1931.

with the treatment given the child during the acute stage of the illness.

Osnato<sup>2</sup> finds similar changes in behavior in children who have suffered from concussion. Post-mortem examinations demonstrated multiple small hemorrhages. These cases of encephalitis and trauma offer an unusually good opportunity to study the effect of organic changes upon human behavior. There has been much too little of this kind of research. Schilder<sup>3</sup> has recently published a book in which he attempts to show the relationship between abnormal behavior and organic pathology of the central nervous system. The work of Economo, which began with his observations of encephalitis, has led to the location of a sleep-center in the midbrain, the pathology of which results in the sleep abnormalities noted during and after encephalitis. The research work of Lashley and other experimental psychologists is leading the way to a better understanding of normal behavior.

Impulsive behavior occurs much more commonly in children who have never had encephalitis. There is nothing in the behavior itself which helps to determine whether or not organic pathology has taken place. In a group of such children studied at the Institute for Child Guidance, in New York City, we found that several particularly difficult behavior problems showed neurological residues which had previously been overlooked. Residual facial paralysis and sluggish pupils were frequently the only remaining findings that indicated a previous encephalitis. A more detailed history then revealed an illness diagnosed as "grippe," during which the child had been delirious, and the illness had been followed by sleep reversal.

The following cases will demonstrate impulsive behavior which is not due to organic pathology of the central nervous system. Their causes are difficult to understand and can only be determined after a painstaking study. The first case has been described by Aichhorn:

Arthur, a ten-year-old boy, has considerable difficulty with his arithmetic. In testing his multiplication, he made the following errors:  $7 \times 5 = 38$ ,  $7 \times 9 = 68$ ,  $8 \times 4 = 38$ . He was surprised when Aichhorn showed him his marked tendency to use the figure "8." They decided to work together until they could discover why number "8" had so much significance. The first incident brought out was that the boy hurt his finger while on street car No. 8, in Vienna. The finger was covered with blood. He then said that the sight of blood bothered him considerably; even

the red lines on the maps left him with an uncomfortable feeling. He finally remembered he had witnessed an accident a year or two before, in which a man riding a bicycle was struck by an automobile. As the man was hit, the bicycle swerved and made a figure "8" on the road. The man's scalp had been badly injured and his face was covered with blood. The telling of this incident was accompanied by considerable emotional excitement. His arithmetic difficulty consisting of the impulsive tendency to use "8" cleared up following the relating of this incident. But the process of solving this situation required several months. Dr. Chamberlain<sup>4</sup> has made a study of the factors responsible for such school difficulties, often of an impulsive nature, which the child cannot explain.

Aichhorn cites another very interesting case of a nine-year-old boy, Hans, whose behavior could not be understood. He was constantly getting into difficulties because of impulsive fighting and teasing which no one could explain. Such behavior was foreign to him and had begun about a week before he was seen. After several interviews he told the following story:

A school companion who sat next to him had a new knife of which he was very proud. Hans, who had always wanted such a knife, was allowed to put it in his pocket. A few minutes later, during which time Hans had gone to the washroom, the boy suddenly discovered that his knife was gone. He had forgotten that he had given it to Hans. He reported to the teacher that his knife was stolen, and because other thefts had recently taken place in this room, the pupils were searched. When Hans returned to the room, he soon learned what had taken place. He feared that his story would not be believed, and immediately returned to the washroom and threw the knife into the toilet. The knife was never found, and the incident was forgotten. Hans was not consciously disturbed by what he had done. After he had told this story to Aichhorn, he was loaned sufficient money to buy a similar knife which was placed on the boy's desk, unknown to him. Immediately following this incident, Hans' troublesome behavior disappeared. Aichhorn has explained this episode of impulsive dissocial behavior as a reaction to a deep sense of guilt and a need for punishment.

A third case is that of William, a seven-year-old Viennese boy. He frequently ran away from home. He had been punished and even tied by a rope to a fence-post in the yard. This had had no effect on him, and he continued to run away.

His parents could give no reason for this behavior. He himself said that he did not know why he felt the urge to leave his home. Observations disclosed that he frequently was found near one of the railroad stations. His home was crowded; several children, the father and mother lived in a three-room apartment and food was scarce. Three years before this, he had arrived, by way of the station which he frequently visited, from the home of his grandmother where he had been cared for as an only child. When he was told that his grandmother had died and that it would be impossible for him to go back to her, the impulsive running away disappeared.

The next case presented difficulty in diagnosis, and was seen at our Clinic: Harold is a ten-year-old boy. He has run away from home on an average of twice a month for the past year. During the three years before that time he ran away occasionally. The foster parents felt that Harold was getting as much attention and affection as the other children, and could not explain his disappearances. Interviews with the boy, who was quite sullen, failed to reveal why he ran away and why he fought attempts to return him to his home. He was removed from this foster home and placed in a correctional institution where he has been for several months. The running away has disappeared. These episodes, which were at first diagnosed as impulsive running away, turned out to be the result of a definite, conscious wish to escape from a situation which was unbearable to him. He had always felt rejected in this home, and has recently told of the well laid plans he had made to get away. This case illustrates consciously controlled behavior, which resembles impulsive behavior.

Impulsive running away, or parionomanie, is not at all uncommon. To be sure, as in the last case described, the impetus for leaving may be conscious or partly conscious. Frequently, however, despite all sincere efforts to co-operate on the part of the patient, the motive cannot be obtained.

A colored boy seen in New York asked to play outside, and when his boarding mother to whom he was very much attached, asked him to be sure and not run away, he answered, "Better not let me out."

Many more illustrations could be given. They all show similar unexplainable behavior. One more case will be added to indicate the relation to sexual factors. A fifteen-year-old girl seen at the Wagner Jauregg Clinic in Vienna behaved normally until the day before her menstruation was due. At such times she escaped from home,

wandered about aimlessly and returned following the completion of her menstrual cycle, hungry and exhausted.

A more serious form of impulsive behavior is seen in the compulsion-neurotic. These cases, fortunately, are uncommon. The child is obsessed with a need to perform certain acts though he realizes at the time that they are senseless. He frequently makes an effort to refrain from these acts, but is unable to do so. In the more involved cases there is a need to wash the hands frequently until every speck of dirt has been removed. Objects must be touched a certain number of times before they can be picked up. A boy who was seen in Vienna was late for school because it took so much time for him to tighten his clothes in such a way that there was no space between his body and his wearing apparel. He placed papers in his shoes so that he could more closely tighten the laces. His necktie and belt were so tight that he was uncomfortable. He insisted, however, that these ceremonials must take place.

To a lesser extent such behavior is noted in the normal person. The tendency for the school child to touch every post that he passes on the way to school, or to walk on the sidewalk so that he misses the cracks, has probably been indulged in at some time or other by most individuals. This becomes abnormal when the child must return a long distance to touch a post which he thinks he has missed. Unless he does this, he is left with a feeling of discomfort and often marked anxiety. The adult compulsion-neurotic may feel that if the ceremonial cannot be carried through, something terrible may happen to a person in his immediate family. The reaction may be one of panic, and completely disappears as soon as the simple act has been accomplished.

Compulsive stealing is one of the commoner forms of delinquency noted in such an individual. The kleptomaniac steals because of an impulsive urge to do so. At certain intervals, he is seized with an urge to steal something. Nothing is allowed to stand in his way. The object is taken, and soon is discarded. He is not interested in the object for its value; he is responding to a compulsion.

Healy<sup>5</sup> of the Judge Baker Foundation, discusses such children in his book on delinquency. He has found that back of such impulsiveness there is meaning. There is an immediate cause in the present mental activity, as well as a preceding cause in mental experiences further back, to which the present act is related. Detailed study of the child with compulsion symptoms frequently leads back to a situation that has occurred early

in life, and which was very painful to him. Witnessing the suicide of a parent, a serious accident, or a scene in which the father beats the mother represent such situations. It is remarkable how, after such situations are recalled to the child, the distressing behavior disappears. Unfortunately, compulsions cannot always be traced to such experiences, and the work necessary to get at them is so difficult that the method is not practical. It has been found that with simpler methods, such as the use of suggestion, the compulsion disappears only to be replaced by a new ceremonial. Attempts have been made to so fill the individual's conscious activity that he has little time for anything else. Interests have been added of a stimulating nature to displace the meaningless compulsion. Such a method can be used only in the milder cases.

Anna Freud<sup>6</sup> has described her treatment of compulsion neurotics. It is time-consuming and laborious, but the results are far more promising than those obtained by the use of any other method. Freud's contribution to the neuroses<sup>7</sup> led to the understanding of the deep unconscious factors involved. The future will say how such cases are best to be treated. Child guidance clinics are using the various treatments in the hope of finding an effective remedy.

Before closing, I shall present one more case recently seen. A ten-year-old boy was brought to the Clinic because of the following behavior: He threatened to kill his foster parents if they crossed him. When he became angry he threw

whatever object he had in his hand. He threw a butcher knife at one of the other children of the family and barely missed her. On another occasion he threw an object that shattered a window. He frequently struck children of the neighborhood without warning.

Physical examination showed syphilis of the nervous system. Lumbar puncture showed a paretic gold curve. The diagnosis of paresis was made, and the behavior was explained as being most likely due to organic changes of the nervous system. In his interviews he frequently referred to his brother whom he loved very much. Formerly the two boys had lived together, but because of difficulties our patient had been removed to his present boarding home. The boy begged to be allowed to be with his brother. This was arranged and the difficult behavior entirely disappeared. He still has his paresis, but the immediate cause for his impulsive rage has been cleared up.

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## FOREIGN BODIES IN THE AIR PASSAGES OF INFANTS\*

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Our president was good enough to give me a great deal of latitude in choosing what particular phase of chest radiography I would talk on. After mature consideration I chose the subject of foreign bodies. I selected this subject for several reasons. First; because in the last few years we have seen several hundred such cases. Second; because relatively very little has been written on a subject of such tremendous importance. Third; because the diagnosis is so extremely easy if the plates are properly made.

Some physician, I have forgotten who, in discussing the aspiration of an organic foreign body into the lung of a child, and its immediate localization and removal by bronchoscopy remarked: "I know of no other condition in medicine where perfect health, impending death, and complete recovery can follow in such rapid sequence."

The symptomology will vary greatly depending on the type of foreign body which is aspirated. The metallic foreign bodies and those others of such a nature as to show directly on the X-ray film usually do not produce marked symptoms. The child usually chokes, gets slightly cyanotic and then coughs. There is usually a period of dyspnoea for an hour or so, followed by a disappearance of all untoward symptoms. Several days later, fever and elevated pulse rate appear, accompanied by cough and dyspnoea.

The foreign bodies which are all opaque to the X-ray in varying degrees present no difficulty in diagnosis. Any X-ray plate showing good detail will show the foreign body.

There is only one important exception to this rule. When a foreign body of a low degree of opacity, such as the rubber from a lead pencil, partially occludes a bronchus, the secretions are retained in that portion of the lung. A dense consolidation of the lung results. This consolidation is often dense enough to mask the foreign body. If such a condition is found, a second plate should be made and the normal exposure time doubled or trebled. The resulting plate will blot out normal lung detail but will show the foreign body clearly.

This type of foreign body rarely gets a chance

to become chronic with resulting complications. The medical profession all have access to X-ray machines, and it is quite the exception when a child is brought in to us with such a foreign body undiagnosed.

Types of foreign bodies which are quite generally missed, and which often cause death within a few hours, are the non-opaque articles. These, in the order of their frequency in our experience, have been peanuts, beans, peas, corn kernels, cherry pits, almonds, pecans, brazil nuts, watermelon seed and cocconut meat.

The symptoms shown by the child following the aspiration of such a foreign body vary greatly. Occasionally such a foreign body is as well-tolerated as an opaque one. However, in the majority of such cases the symptoms are immediate and alarming. The foreign protein contained in these nuts, seeds and fruit kernels produces a condition closely akin to anaphylactic shock. The child rapidly becomes dyspnoeic and cyanotic.

The pulse is extremely rapid and there is a pronounced rattle and wheeze noted with respiration. The temperature is usually moderately high and occurs soon after the aspiration. We saw one child with a temperature of 103 forty-five minutes after the aspiration of a salted almond. The temperature was normal within two hours after bronchoscopic removal of the nut.

Why some of these children tolerate such foreign bodies with only moderate discomfort, and why others die within a few hours is not understood any more clearly than are the other phases of protein sensitization.

We have the following rule in the X-ray departments of all our hospitals and in our office. When a child presents itself for X-ray examination for a suspected foreign body in the air passages, or when routing chest plates are negative in a child presenting shortness of breath or wheezing or rattling in the chest, the following technique should be followed out in subsequent plates.

## TECHNIQUE

Use a wooden or aluminum cassette holder. Place the child flat on his back. Have two assistants to help; one can hold the shoulders flat with her thumbs and the other can hold the pelvis

\*Read before the Great Northern Railway Surgeon's Association at Glacier Park, Montana, June 30th, 1931.

flat on the plate, thus preventing any rotation of the patient. The exposures should be made preferably in one-twentieth of a second and never slower than one-tenth of a second. Make six to eight plates and make exposures with an extension switch in order that the operator may watch the respirations.

Make one exposure at the height of inspiration and the remainder of the plates, as nearly as possible at the end of expiration. When the plates are developed, the different phases of inspiration can be determined by the height of the diaphragm shadows. Observe both sides of the diaphragm and draw your deductions from one that presents the greater excursion. All the plates can then be discarded except two, one on full inspiration and the one that shows the greatest degree of expiration.

#### WHAT IS SHOWN ON THE PLATES

A metallic foreign body will, of course, cast a shadow on the plate, so we need not worry about the secondary changes, which in this case are usually absent.

Non-opaque foreign bodies are recognized by their preventing air from entering or leaving the affected lung or lobe of a lung. If the foreign body entirely occludes a bronchus, that lung or portion of lung, rapidly becomes airless and a condition, atelectasis, occurs. If, however, the foreign body allows air to enter the lung, but by a ball-valve action prevents its leaving, we have a condition spoken of as obstructive emphysema. When the foreign body only partially occludes the bronchus and allows some air to enter and leave, we sooner or later get a condition of drowned lung due to retained secretions in the lung.

Drowned lung is practically always produced by metallic or rubber objects which will cast a shadow on the plate.

So, from a standpoint of indirect changes in the lung, we have only to consider non-opaque foreign bodies which produce either atelectasis or obstructive emphysema. By far, the greater number of these have produced an obstructive emphysema rather than an atelectasis. The bean is the usual exception. A bean swells as soon as it is acted upon by the secretions of the bronchus, and by this swelling completely occludes the bronchus and soon renders that lung completely airless or atelectic.

#### OBSTRUCTIVE EMPHYSEMA

This condition results in the vast majority of cases in which a nut or a piece of fruit or grain

kernel is inhaled into the bronchus of a lung. The plate made on inspiration shows little or no change. The plate made, however, at the height of expiration shows a most striking change. The foreign body acts as a ball-valve, allowing air to enter the lung but interfering with its leaving. Consequently, a much higher air content is noted on the affected side. The heart is markedly displaced toward the unaffected side. The diaphragm on the affected side does not rise to its normal level and flattens out, losing its normal curvature.

The only other conditions which can produce such findings in children are tuberculous granulation tissue growing in the main bronchus, or occasionally a plug of mucous plugging a bronchus.

And now for the foreign bodies which produce atelectasis. The affected lung or lobe is airless and the affected portion takes on a smooth opaque appearance like that of a lobar pneumonia. The heart is drawn towards the affected side. The plate made on inspiration best shows this cardiac displacement. In children, I know of but one other condition that can produce like findings, and that is a purulent bronchitis, where a plug of mucous completely blocks a bronchus.

#### TRACHEA

Foreign bodies of a non-opaque character give no constant finding when in the trachea. Theoretically, a change in size of the heart in its transverse diameter is noted between the inspiratory and expiratory plates. This finding has not been constant in our cases of foreign bodies in the trachea.

The importance of the early recognition and extraction of foreign bodies from the lung cannot be over-estimated. If the individual does not die from the immediate effects, a long chain of inevitable complications such as pneumonia, bronchiectasis, lung abscess, empyema and pneumo-thorax are in store for the patient. Practically all of these can be prevented by the early recognition and removal of the foreign bodies.

In closing, let me stress these few points. 1. Most non-opaque foreign bodies, particularly nuts or grain kernels, cause obstructive emphysema. 2. These can only be detected on plates made at the end of expiration. 3. Keep on making plates until you get one made on complete expiration. This is most easily done by standing by the child and making the exposures with an extension switch. 4. I know of no single procedure which is worth more to the individual than the early recognition of a foreign body in the lung.

## THE TREATMENT OF ABDOMINAL INJURIES\*

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The treatment of abdominal injuries demands careful examination, early diagnosis and prompt decision as to the course of action. It is often necessary to have a somewhat more radical point of view in the treatment of this class of injuries than is customary in the treatment of ordinary injuries. The reasons for this are obvious. If injury to the abdominal viscera occurs, and the damage is promptly repaired, the patient may have an excellent chance to recover, whereas waiting till the following day to decide the nature and extent of the injury may deprive the patient of his chance to live.

Acute injuries to the abdomen are usually considered under two classifications; those caused by penetrating wounds and those caused without an open wound. Penetrating wounds are, of course, caused most often by gunshot and stab wounds. Difficult as the problem may be, it is not difficult to decide on the course of action in these cases as it is a general rule that in this class of cases the abdomen should always be opened soon after the injury, even though the patient's general condition seems so good as to rule out the probability of intra-abdominal injury. This is a general rule because any of the abdominal viscera may be injured, or even perforated, with relatively little to be found on physical examination during the first few hours, and, too, the patient's favorable appearance may be very deceiving. If the bowel is penetrated this will almost certainly be followed by peritonitis unless the injury is accurately and carefully repaired. It is much better to open the abdomen and find no evidence of injury than to fail to open the abdomen, if there has been injury to any of the viscera.

In considering wounds of the abdomen caused by non-penetrating trauma, we find there is not necessarily external evidence of injury to the abdomen. In some of these cases it may be very difficult to decide upon the safest procedure for the patient. No one likes the idea of an unnecessary laparotomy. That is conceded by everyone. Yet, here again it is much better to open an abdomen and find no evidence of injury than to fail to repair a divided bowel until it is too late,

because of a too conservative attitude. Someone has said that in about a third of this class of cases the diagnosis is obvious. In another third the diagnosis is questionable and in the remainder no one can tell without opening the abdomen whether or not there is intra-abdominal injury.

The abdominal viscera are, in general, of two classes. First, the solid, or parenchymatous, these being the liver, spleen, pancreas and kidneys, and second, the hollow viscera, the stomach, intestines, ureters, bladder and blood vessels. The danger of injury to the parenchymatous organs is mainly that of hemorrhage following ruptures. In the hollow organs there is danger of both hemorrhage and infection.

When a patient who has just received an injury to his abdomen by falling from a height, from being forcibly struck in the abdomen with some solid or blunt object, from being kicked or struck with a board, a club or someone's knee, or from an automobile accident, and complains of pain in the abdomen, the attending physician is confronted with a real problem. Many times these abdominal injuries are complicated by injuries to other parts of the body, perhaps fractures. This may render the problem still more difficult. I believe a good general rule to follow is first to obtain a history, as accurate as possible, with a description of the accident, trying to get a mental picture of exactly what happened and bearing in mind the length of time which has elapsed. One should also learn if there has been hemoptysis, hematemesis or other vomiting, the length of time since the last urination and defecation, and the location, extent and character of the pain.

Then a careful and complete physical examination should be made not only for abdominal injury but also for injury to other parts of the body. It is also important to bear in mind, when one's attention is directed mainly to the possibility of skull fracture or some other bone injury, that abdominal injury may also be present. I have seen cases in which the most striking part of the picture is a skull fracture, and it is impossible to decide whether or not abdominal injury is present. I have seen autopsies done on these patients and have been surprised, several times, to find an intra-abdominal injury that was not diagnosed or

\*Read before meeting of the Hennepin County Medical Society, November 18, 1931.

perhaps even thought probable. Sometimes this error is made because the possibility of abdominal injury does not occur to us on account of the severity of the other injury. An X-ray examination may aid. A flat film of the abdomen with the patient upright is best, but if this is not practical, he can be on his back with the film held on one side while the exposure made in a lateral direction. This can be done promptly, with a portable machine if necessary, and with no loss of valuable time.

The injury to the abdominal wall may be superficial, deep or penetrating. It is important to determine whether or not the wound has penetrated the abdominal wall. Another condition which may make the diagnosis difficult is sprain of the abdominal muscles, with resulting pain, tenderness and rigidity. If there is accompanying shock, it may be impossible to tell whether or not there is intra-abdominal injury. I believe a good plan to follow in that case is to put the patient to bed and treat him for shock with external heat and perhaps a very mild sedative. Then obtain a careful record and mental picture of all signs and symptoms, watch the patient and examine him again in about fifteen minutes, paying particular attention to the pulse-rate, rigidity and amount of tenderness. If the pulse-rate continues to increase when a patient has been kept quietly in bed with adequate treatment for shock for two hours, it speaks quite strongly for the presence of intra-abdominal injury, and particularly hemorrhage.

If the patient is not watched constantly, he should be examined at intervals of about fifteen minutes during the first hour, thus the surgeon is much more sure of his diagnosis than if he decides on his first observation. This is particularly true if he is inclined to believe that no intra-abdominal injury is present. I wish to emphasize the value of observing the pulse-rate, as in most injuries that are not serious the pulse rate does not tend to increase and, in fact, usually slows up in two hours after the time the patient is in bed with heat and ordinary treatment for shock. It cannot be said that this is an absolute rule, but it helps, and I believe fewer serious mistakes are made if an abdomen is opened when there is a history of abdominal injury, and pain and tenderness are present, and the pulse-rate tends to increase. If the bowel is ruptured, and there is a delay of as much as twelve hours from the time of the accident to the operation, the chance for recovery is quite remote. It seems to be true that the longer the time that elapses between the injury and the operation, the greater the mortality.

Of the solid or parenchymatous organs, the

one most frequently ruptured is the liver. This may result from indirect force, such as falling from a height and lighting on the feet or buttocks, when the liver may be torn loose from the structures which normally support it. There also may be rupture by direct injury, wherein the biggest danger is that of hemorrhage, and the bleeding may be very profuse. In extensive wounds to the liver the patient may lose enormous quantities of blood in a relatively short time. However, in a great many cases the injury to the liver is not so extensive, the bleeding is slow, and the patient's life may be saved if the liver is sewed even several hours after the accident. In some cases the laceration of the liver may be extensive, irregular, and of such a character as to make it impossible to repair the damage by applying a suture. Tamponing such wounds with gauze may be a very useful procedure.

The spleen is perhaps the organ next most frequently ruptured; this, also, is a very vascular organ, and bleeding may be very rapid. If the spleen is enlarged or diseased, it is, of course, more apt to be injured by trauma to the abdomen. Cases are described where an enlarged spleen is ruptured by even slight injury to the abdomen. If the damage to the spleen is not too extensive, applying a suture may control the hemorrhage. Splenectomy is often necessary, and should be done without hesitation when the spleen has been badly lacerated or injured.

The pancreas is not so commonly injured, but it is not as infrequent as we might perhaps think. I will cite a case which I saw at autopsy. This man had been in an automobile accident on September 16, 1931. He was driving, and for some reason his car ran into a telephone pole. He was thrown violently against the steering wheel, receiving a severe blow in the epigastrium. After the accident he walked about twenty blocks to his home. He vomited two or three times, the vomitus consisting of the food taken at the evening meal. There was no blood. The physician called, found him lying in bed complaining of some pain in the epigastrium and examined him carefully. There were bruises about the face, and the abdomen showed contusion in the upper portion and was markedly rigid. The patient was not in shock, but he was advised to go to the hospital and to secure the services of a surgeon. He refused to do this, and a surgeon was called to his home.

The patient again vomited once or twice; he did not rest well, and groaned a good deal, but when asked if he had pain, he answered usually in the negative. The abdomen was greatly distended at times, although this distension could be

reduced with enemas. On September 27th, eleven days after the injury, he was found to have a weak and irregular pulse, and the internist was called to see the patient on account of a supposed heart lesion. At that time the patient was removed to a hospital. He appeared to be very sick, and his general condition was much worse. He was examined carefully including X-ray examination, and his blood showed hemoglobin 75 per cent rbc, four million; leukocytes 60,000; pmn's 97 per cent; lymphocytes three per cent. He died October 2. An autopsy was performed, and when the peritoneal cavity was opened it was found to contain about 5,000 cc. of a thin reddish fluid with a large amount of fat necrosis. The pancreas was torn completely in two at the neck, so that the head and the body were separated by a distance of about two centimeters. There was no other change in other parts of the pancreas. This case is cited to remind us that such things do occur and should be born in mind. Other cases of rupture of the pancreas by more or less similar trauma have been reported in the literature.

Rupture of the gall bladder rarely occurs unless it accompanies injury to the liver. Here the danger is from a peritonitis caused by the presence of the bile in the peritoneal cavity. This, while serious, is not so rapidly developing nor so uniformly fatal as rupture of the gastrointestinal tract. The other parenchymatous organs; namely, the kidneys, are frequently injured. Here the diagnosis can more easily be made. Blood in the urine, passed voluntarily or obtained through a catheter from the bladder, means trauma to the urinary tract, and if there is pain and tenderness and, especially if a mass can be palpated in the region of the kidney, and the muscles over the kidney are spastic and deep pressure is painful, these findings are quite certain to mean a rupture of the kidney.

If one could be certain that there were no other injury within the abdomen, and the general condition was fairly good, it would probably be justifiable to watch the patient for a while and not to be so prompt in operating. It is more permissible to treat kidney injuries expectantly than injuries to other parenchymatous organs. If the urine continues to be bloody, and there is severe pain of the renal colic type, it usually means that blood clots are being passed down the ureter. It is often good judgement to wait a few days with these kidney injuries. Sometimes an extravasation of the urine may occur around the kidney, but this is unusual.

Most surgeons feel that ureteral catheterization is contra-indicated in the presence of acute injury. Cystoscopy, with ureteral catheterization

of the opposite side, may be done for the purpose of determining its function. The function of the uninjured kidney may influence the surgeon's judgement in deciding what shall be done on the injured side. If operation is decided upon for any reason, and the kidney exposed, I believe the tendency is, now-adays, to be more conservative than was formerly the custom. If the pelvis of the kidney is torn, and the cortex is completely fractured, nephrectomy is probably indicated, since repair of the kidney will be almost impossible, and the kidney is likely to be functionless anyway. For less than complete fractures of the kidney, especially if the pelvis is not torn, an attempt should be made to save the organ by suturing it together. Usually these ruptures of the kidney are retroperitoneal.

When one considers the hollow organs—the gastro-intestinal tract and bladder, the dangers are hemorrhage and the added risk of infection. Rupture of the stomach may occur from severe blows on the abdomen or be a part of a crushing injury. Rupture of the small or large bowel may occur from similar causes, and not infrequently does occur from blows on the abdomen.

The case illustrates this in which a man working at a buzz saw, was injured when the board flew up and struck him in the abdomen, causing a complete division of the small bowel as it was crushed against the spine. The bowel may be so divided even without external evidence of injury on the skin, and a patient so injured usually complains of severe pain in the abdomen, is apt to be in shock and will usually have some increase in his pulse-rate immediately.

In this class of patients I believe it is very important to examine carefully, and, if one is undecided whether to open the abdomen or not, to watch and pay particular attention to the pulse-rate as well as physical signs of tenderness and muscle spasm. In cases of reasonable doubt, open the abdomen and do so promptly because the patient's only chance of living depends on the surgeon's recognizing and repairing the injury to the bowel promptly. If such a patient is allowed to go twelve hours or more with a divided bowel, he has very little chance of recovery.

Bladder injuries are most apt to occur when the bladder is filled with urine. They may be intraperitoneal or extraperitoneal. The most common site of intraperitoneal rupture is said to be in front, between the fundus and symphysis. The next most common site is on the posterolateral surface. These injuries, if not caused by penetrating wounds, usually occur as a complication to a fractured pelvis. Here the signs are blood in the urine, pain and tenderness in the

bladder region, and, usually, symptoms and signs of shock.

When a definite quantity of water or other liquid is introduced into the bladder and immediately withdrawn with a catheter, if less can be recovered than was injected this means a rupture of the bladder. Cases are described wherein a larger quantity is recovered, due to the fact that the catheter is passed on through a rupture in the bladder wall into the peritoneal cavity, sometimes allowing an enormous quantity of fluid to be drawn off. Another valuable aid in diagnosis in this type of case is to inject a small amount of air into the bladder and take an X-ray picture. If rupture of the bladder is present air can be noted in the peritoneal cavity.

Tearing of the mesentery occurs sometimes independently from bowel injury and sometimes is associated with it. It is stated that if the mesentery is torn so that it is separated from the intestine for as much as a centimeter-and-a-half, gangrene of the gut will result. Injuries to the large blood vessels by perforation or crushing injury are apt to be so rapidly fatal that surgical treatment cannot be instituted.

Sometimes extensive retroperitoneal hemorrhage may occur with the intra-abdominal injury. About two years ago I was called upon to treat a young lady who had been in an automobile accident which gave her numerous contusions and bruises and also considerable pain in the abdomen. This happened about ninety miles out in the country. She was given first aid and hurried to a local hospital. I saw her shortly after she arrived. There was an almost board-like rigidity of the abdomen. There was no evidence of fracture anywhere in the body. Catheterization of the bladder showed no evidence of blood, and the same amount of fluid injected was recovered. Consultation was obtained, and immediate operation was decided upon on the basis of the probability of intra-abdominal injury. When the abdomen was opened, there was no fluid or evidence of soiling of the peritoneal cavity, but there was a very extensive retroperitoneal hemorrhage. There was only one place on the entire intestinal tract where there was any evidence of injury, and this appeared to be a contusion, about a centimeter in diameter. When this area was touched with a gauze sponge there was a very slight staining of the sponge with blood. The abdomen was closed without drainage, no treatment being given to any of the viscera.

Transfusions were given to the patient, and she made a splendid rally, as far as her general condition was concerned, for about twenty-four hours. Then she became rapidly worse and died

about forty hours after her injury. An autopsy was done at which it was found that there was the extensive retroperitoneal hemorrhage which had been seen at operation, and a gas bacillus infection, evidence of which was seen in all the serous cavities of the body. It was the opinion of the pathologist, as well as my own, that there was injury enough to the bowel to allow the escape of the gas bacillus from the bowel without a demonstrable solution of its continuity.

Another class of injury, which we will mention in passing, is that caused by inflation of the bowel through the rectum. A number of these cases have been reported where someone, in a playful mood, directs a stream of compressed air in or towards the rectum, causing an inflation of the colon. The public does not appreciate the seriousness of this injury, and the fact that the bowel can be ruptured by what seems like a relatively small amount of pressure. I saw a patient in whom this had happened. A workman was bending over tying his shoe and another workman came up from behind with an air hose and applied the stream of air to the stool upon which he was sitting. The air rushed into the rectum, distended and ruptured the bowel, and the man died of a peritonitis although he was operated upon quite promptly after the injury.

The purpose of this paper is to emphasize the necessity of making a reasonably prompt decision upon the course of action when one is called upon to treat an individual who has received an injury to the abdomen, and also to emphasize the importance of watching your patient for an hour or two if in doubt whether to open the abdomen or not, paying particular attention to the pulse-rate as well as to local physical signs of tenderness, rigidity, and muscle spasm. An X-ray examination of the abdomen, as described above, may be done with profit where there is a suspected perforation of the gastro-intestinal tract, if it can be done promptly, with the patient upright or the head and shoulders elevated to determine the presence or absence of gas under the diaphragm. If the patient cannot be raised, it is of value to take an X-ray picture with the patient lying flat on his back, the film being held vertically at one side of the abdomen and the exposure made in a lateral direction to show the presence or absence of collection of air or gas in the highest part of the abdomen; namely under the anterior abdominal wall. One should be much less chagrined to open an abdomen and find that there is no evidence of intra-abdominal injury, than to fail to open an abdomen in which the intestine has been divided, or in which hemorrhage has occurred from a ruptured liver or spleen, or other serious damage has been done.

## THE GENESIS OF SOCIAL INSURANCE

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Social Insurance is the hybrid offspring of impracticable sentimentalism and political expediency. It is an epidemic disease first observed in Germany about fifty years ago which has gradually spread and infected a considerable number of the nations of the earth and now has arrived at our very doors. Unless we succeed in establishing a rigorous quarantine of enlightened public opinion, it will surely gain a foothold in this country in the not distant future.

Social Insurance consists of the following subdivisions or parts: Compulsory health insurance, old age pensions, widows' and orphans' pensions, and unemployment pensions or doles. In none of the countries were they all adopted at the same time. Germany adopted compulsory health insurance in 1883, and all of the other forms since that time. Austria adopted compulsory health insurance in 1888; Hungary, in 1891. England adopted old age pensions first and compulsory health insurance in 1911, and the others subsequently. In this country some of the states have adopted old age pensions and some widows' and orphans' pensions, but so far none have adopted compulsory health insurance, for which negative blessing let us raise our voices in thanksgiving.

When the scientific physician is confronted with the problems presented by a new patient, he meets the situation in the following manner: he obtains a complete family and personal history in order to ascertain if possible the causes which have brought about the condition; by his physical examination and laboratory investigations he finds out what variations from the normal have taken place; after all this he is in a position to advise and institute the proper treatment. Let us follow the same course in the study of this problem.

During the late seventies a number of German parlor socialists conceived the idea that the state make itself responsible for the medical care of its workers. The sentiment in favor of compulsory health insurance grew rapidly among the workers, and Bismarck, although expressing serious doubts as to the soundness of such a measure, yet feeling that something had to be done in order to appease the clamor of the proletariat and the alarming growth of socialism, adopted social insur-

ance as a government measure, had a bill drafted and enacted into law.

In England, National Insurance, as it is called there, had a slightly different setting but substantially the same background. In 1910, David Lloyd George in order to strengthen himself politically decided the time for such legislation was opportune. Not being able to speak German, he gathered about himself several interpreters, hid himself to Germany and after interviewing the well paid heads of the German system, and after having been wined and dined and lionized for two weeks or so, he returned to England very enthusiastic about the whole project, and a law drafted, and later secured its passage. In the recent parliamentary election the Liberty party, of which Lloyd George has been the head for many years, elected just four members to Parliament or less than one per cent of the whole number. So while Lloyd George may have saved his political skin by National Insurance in 1911, he certainly lost his hide by it in 1931.

Practically every reform movement attracts to itself a considerable number of well meaning, emotionally impressionable, impractical, irresponsible, very vociferous individuals, and very often a group, usually the very ones who manage the propaganda and who hope to gain some pecuniary benefit from it. Social Insurance is no exception to this general rule.

Some of the common characteristics of reformers is that they want a new law passed for every human ill, and when the law is enacted, they either sit back waiting for the millennium to arrive or they rush off looking for new evils to correct by new laws forgetting to see to it that the law just passed is being properly enforced, and forgetting at all times that all laws must depend for their enforcement not upon supermen but upon men often of less than average intelligence and integrity, upon politicians and their henchmen, who are quick to see how these usually unsound and loosely drawn laws can be converted to their own advantage.

(The above is what is actually happening in some of the countries where such laws are in operation as future installments will show.)

## GAUGING TOOTH HEALTH\*

ELMER S. BEST, D. D. S.

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*This is the first of a series of articles written by Dr. Best for the Journal-Lancet on dental disorders which are closely allied with the general health of the individual, and are of especial interest to the physician.*

It is a matter of common knowledge to every medical practitioner that no part of the body is completely isolated from the whole, but that every part is intimately related, and draws nourishment from the same system. Until recently, dentists treated each tooth as an isolated unit separating its individual problem from that of every other tooth and divorcing it entirely from systemic affiliations. But today the dentist realizes the important relationship that the individual tooth has to the efficient and healthful functioning of the dental apparatus and also the influence it exerts on the whole body. The teeth are united inseparably with the rest of the human mechanism, and are subject to the same nutritional and other influences which constitute the life phenomena of the individual. In fact the teeth are an important index in evaluating the general well-being.

Dental caries, the major dental problem, with its baneful sequela, apical infection, has been found to exert a profound influence on bodily health, and, conversely, caries is largely due to systemic disturbance brought about by dietary imbalance. In the future caries may prove as valuable a clinical symptom to the internist as chills and fever are to the diagnosis of malaria. At the present time much experimental evidence concerning dental caries is being correlated, and important deductions made so that we are enabled to apply much of the present statistical knowledge in a clinical manner. In fact, the clinician can scarcely disregard the field of stomatology in diagnosing and treating a given case.

The failure to apply stomatological information has been due not so much to ignorance or lack of appreciation of the need for it, as inability to lay hands upon something tangible. Then, too, the "mechanical complex" has entered the picture in too many cases and increased the problem tre-

mendously. Consequently, any method whereby we can gauge the dental status of an individual in a concise manner will be a decided step forward in aiding clinical medicine. Such a method has been formulated by Charles F. Bodecker and Henry W. C. Bodecker in devising a practical index of the varying susceptibility to dental caries in man.

This index reveals the present condition of the patients' dental organs and is known as the Life Caries Index. It is obtained by adding the decayed or restored areas of all the teeth except the lower anteriors, upper and lower cuspids and third molar teeth. The sum of the susceptible areas, except the excluded teeth above, equals one hundred, therefore if there are twenty carious or restored areas, the Life Caries Index is 20 per cent which represents the degree of dental destruction. This index is a guide in determining the oral manifestations of the physical health of the individual. Consequently it may serve as a valuable addition to the history of a given case.

Although the degree of dental destruction is important, the rapidity of the active process of decay is far more important. Therefore, the Caries-Susceptibility Index is ascertained. This is arrived at on a comparative basis. Suppose the Life Caries Index was 20 per cent a year ago and at the present time it is 24 per cent. The Caries-Susceptibility Index will be 4 per cent for the year. This has the added advantage of being diagnostic; it shows the general trend of bodily health as manifested in the mouth.

An additional advantage of this method is that it enables one to determine the Relative Age Caries Index, also that for certain groups or vocations. Thus it is determined that caries is most active between the ages of eight and eighteen, and usually comes to a standstill at twenty-five years of age. Furthermore, certain groups and vocations are more or less healthy than others from this standpoint. We all understand that weight charts are not inflexible and neither is the Caries Index, nevertheless, both are a great aid in determining the health status of an individual.

The Life Caries Index idea may have far-

\*From "A Practical Index of the Varying Susceptibility to Dental Caries in Man."—Dental Cosmos, Vol. LXXIII, July, 1931, pp. 707-716. By Charles F. Bodecker, D. D. S., F. A. C. D., New York, N. Y., Professor of Oral Histology and Embryology, Columbia University Dental School and Henry W. C. Bodecker, B. S., M. D., D. D. S., Med. Dent., Berlin, Germany. (Members of the Commonwealth Fund Committee for the Study of the Cause of Dental Caries.)

reaching results. Certainly this is one definite instance in which the dental profession may aid the medical profession. It is only fair to the patients who place their future health and happiness in our hands, that a closer co-operation be

maintained between these closely-allied professions. It is my observation that patients who become interested in their mouth health quickly become interested in their general health.

## CLINICAL PATHOLOGICAL CONFERENCE

By E. T. BELL, M.D.

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The Department of Pathology of the University of Minnesota conducts a course in clinical pathologic conferences. Cases are selected in which a thorough clinical study has been made. Many physicians have expressed interest in this type of study and therefore the Journal-Lancet is publishing a series of these conferences. The clinical data are taken from the hospital records and are given absolutely according to the data on the record. Following the clinical report a summary of the pathologic findings is given and a few comments are made on interesting features of the case.

### Autopsy—31—1042.

A man, 25 years of age, was admitted June 9, 1931. Slightly over two years ago he began to feel weak and noticed fever. He consulted a physician who told him he thought he had tuberculosis of the kidneys because he had red blood cells in the urine. After about two months of observation the temperature became normal and remained so for a few weeks when it again rose. At this time his physician did not think he had tuberculosis of the kidneys but some other condition. The temperature remained elevated except for one remission about a year ago, when the patient was free of fever for about nine months. During this period he gained in weight and strength. Six months ago he again suffered a relapse, began to have fever, felt weak, and noticed a small painless swelling in the right maxillary triangle. This was the first time he had noticed any swelling. He went to a dentist and had an X-ray. The dentist found no dental lesion.

He then came to the dispensary and was admitted for a biopsy study of a gland in November, 1930. From that time he had enlarged glands in the axillary and inguinal regions. These decreased in size markedly with X-ray therapy. For about four months he felt strong, gained weight, and was free from fever. About three weeks before admission he again began to have fever and felt weak. He gradually went down hill; had diarrhea and abdominal distension. There was marked pallor of the skin and a cough. The cough was nonproductive. This last description was quite characteristic of the patient's course during each relapse; that is, he would have fever, weakness, abdominal distension, diarrhea, and pronounced secondary anemia, while during a remission he would gain strength and the secondary anemia would become less marked. The family history was negative.

Examination showed a poorly nourished white man with marked pallor. The neck showed firm palpable lymph nodes which were not very large and not tender. There were lymph nodes in the axilla and inguinal regions. The bases of both lungs were dull to percussion posteriorly; respirations short and rapid; apices showed nothing of note. The heart was negative. The abdomen was distended. The spleen was easily palpable. There was dullness in both flanks which moved with move-

ments of the patient. Slight pitting edema of the sacrum and ankles.

Blood on admission: hemoglobin 35 per cent; erythrocytes 2,030,000; 42 per cent polymorphonuclear leucocytes, 53 per cent lymphocytes, 3 per cent monocytes, and 2 per cent eosinophils. Temperature 101°; pulse 120.

The patient was transfused on June 9 and June 11. During this time there were numerous chest findings, such as dullness, rales, and bronchial breathing, which led the clinicians to believe that there was a bronchopneumonia present. On June 13 these findings changed and cleared up. On June 17 purpuric spots were noticed on the back. The heart rate was rapid. The blood pressure was 88/58 and jaundice was noted. The jaundice rapidly progressed so that at the time of death, one day later, the patient was heavily jaundiced. The temperature varied from 105° to 99°; it was usually around 103°. The hemoglobin on June 16 was 45 per cent; red cells 2,250,000. The urine was negative on one occasion. X-ray of the chest on June 11 showed increased density in the left base, possibly due to pneumonia; some upper mediastinal widening on the right, probably due to glands. The patient died June 18, 1931.

Postmortem report. Marked emaciation; jaundice ++; 300 cc. of bile-stained ascitic fluid. Liver border 3.5 cm. below the costal margin in the right mid-clavicular line. Spleen 2 cm. below the costal margin. The left pleural cavity contains about 500 cc. of clear, bile-stained, serous fluid. The heart weighs 225 grams; no disease. Marked enlargement of the bronchial lymph nodes.

The liver weighs 2,435 grams. Numerous yellowish white nodules, 1 mm. to 5 mm. in diameter, are scattered throughout the liver substance; they are rather uniformly distributed; most of them are quite small but one measures 7 cm. in diameter. No evidence of anatomic obstruction of the common bile duct. The spleen weighs 988 grams; numerous small yellowish nodules on section. The kidneys show no nodules on section. The retroperitoneal lymph nodes are all markedly enlarged and many of them show necrotic centers on section.

Microscopic diagnosis: Hodgkin's disease.

Comment. There is marked infiltration of the liver

and spleen in this case with nodules of neoplastic appearance in the liver; the extensive involvement of the liver presumably explains the high degree of jaundice.

#### Autopsy—30—1978.

The case is that of a white man, aged 51, who was admitted to hospital December 3, 1930. He first complained of tiring nine years ago. Six years ago he developed left inguinal hernia; was definitely weak, losing weight, and was drowsy. He had noted occasional attacks of vomiting. Four years ago he first noted urgency of urination. One year ago he began to have attacks of stiffness and soreness in the back and shoulders, associated with generalized headaches. These attacks came on every few weeks. The weakness of which he complained earlier steadily increased. Occasionally he was dizzy. At times he would fall asleep at the table but was easily aroused. Three months ago he developed severe throbbing, aching sensation in the occipital region, especially in the daytime. Two months ago he was forced to go to bed because of weakness, dizziness, occipital headaches, nausea and vomiting (not projectile). He also had anorexia and loss of weight.

Physical examination showed a poorly nourished white man who answered questions slowly and moved slowly. Pupils reacted normally. There was tenderness in the occipital region and down the neck. The neck was slightly stiff and he moved it carefully and slowly. The heart showed many extra systoles. A firm movable tender mass was present in the left upper quadrant of the abdomen. This mass moved very little with respiration.

Laboratory examination. Hemoglobin 72 per cent; red blood cells 3,660,000; white cells 6,900. Urine was negative. Blood and spinal fluid Wassermanns were negative. The spinal fluid was under pressure of 250 mm. of water; on compression of the jugular vein the Subsequently dilation of the pupils was noted and there was nystagmus when the patient looked to the right. X-ray of the gastrointestinal tract showed round filling defects in the stomach with slight retention at the end of four hours. X-ray of the chest showed round dense shadows in the lungs.

The diagnosis in this case was a retroperitoneal tumor which was compressing the stomach and had produced metastases in the lungs and probably also in the brain. Death December 31, 1930.

Post-mortem report. The peritoneal cavity shows no free fluid. A large tumor of the left kidney is found, occupying the middle and upper portion; the dimensions of the tumor are 16x11x9 cm.; it compresses the stomach and produced the deformity noted by the roentgenologist. The tumor is the typical carcinoma of the cortex (so-called hypernephroma). There is a deformity of the pelvis of this kidney which might have been recognized with a pyelogram. The lungs show seven or eight metastatic nodules, varying from two to four cm. in diameter. The heart shows no disease. The spleen and liver show no disease. There are metastatic tumors in the brain; one of these 2x4 cm. is in the right cerebellar hemisphere; another 5x7 cm. is in the right temporal lobe. There is distension of the third and both lateral ventricles, due to pressure of the tumors.

Diagnosis. Primary carcinoma of the cortex of the left kidney (hypernephroma) with metastases to the lungs and brain.

#### Autopsy—31—868.

A man, 67 years of age, was admitted June 15, 1930.

In 1924 he first noticed enlargement of the posterior auricular nodes. The nodes were hard and discrete and about 1 cm. in diameter. At the same time he noticed that he became tired and weak rather easily. In 1925 his weight had decreased from 200 pounds to 170 pounds. His general condition was about the same. In 1926 he first noticed enlargement of the inguinal lymph nodes. These became larger than those in the posterior auricular regions. In 1927 he first noticed frequency of urination. In July, 1927, he first consulted a physician.

In June, 1930, a biopsy was made of a left inguinal node. At this time he had generalized lymphadenopathy. The spleen could not be felt. On June 15 his weight was 140 pounds. There was pronounced weakness. He had had no X-ray treatment. There had been no fever, chills, itching of the skin, or night sweats. He complained of aching all over the body. There was generalized adenopathy and he thought that the nodes were enlarging more rapidly recently. No dizziness, convulsions, headaches, or ocular disturbances. He had urinary frequency and burning but no hematuria or pyuria. Blood pressure 144/84. Temperature 98°; pulse 84. Nearly all the peripheral lymph nodes were notably enlarged. The liver was palpable several centimeters below the costal margin. The spleen was palpable. Pitting edema of both legs. The prostate was large and fairly firm. There was also a mass in the right lateral rectal wall. Urine negative. Wassermann negative.

October 15, 1930, the urine showed a trace of albumin. Hemoglobin 76 per cent; red blood cells 3,800,000; white cells 9,750; polymorphonuclears 32 per cent; lymphocytes 67 per cent; eosinophils 1 per cent. Temperature 98°. X-ray of the chest showed only slight widening of the hilus shadows. October 29 urea nitrogen was 20.5 mg. November 5 blood contained a few immature lymphocytes; total count 9,250. November 21 X-ray treatments were begun.

May 1, 1931, patient complained of severe pain in the lumbar region, radiating to the left thigh and the epigastrium. He also had nausea and vomiting. There was urinary frequency; profuse sweating; no chills; no cough; temperature 99.2°. Blood pressure 142/88. Weight 130 pounds; marked emaciation. Liver and spleen palpable. Generalized adenopathy; no edema. Urine: trace of albumin. Leucocytes 6,650; polymorphonuclears 48 per cent; lymphocytes 48 per cent; eosinophils 4 per cent. He complained chiefly of pain in the back. X-ray of the spine suggested hypertrophic arthritis. He failed slowly and died May 16, 1931.

Postmortem report. Marked emaciation. Enlargement of lymph nodes throughout body, including the mediastinal and retroperitoneal. Spleen weighs 350 grams; enlarged whitish nodules about the hilus. The liver weighs 1,850 grams; numerous grayish nodules on section. Similar small grayish nodules are found in the kidneys and along the course of the left ureter. Benign hypertrophy of the prostate.

Microscopic examination shows aleukemia.

Comment. Aleukemia bears a close clinical resemblance to Hodgkin's disease. The biopsy suggested leukemia, since there was no evidence of fibrosis of the lymph node. The immature lymphocytes found in the blood also suggested leukemia. The organ infiltrations found at postmortem are of leukemic type. The distinction between leukemia and Hodgkin's is, however, not very sharp.

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### THE COST OF MEDICAL CARE

For several years the magazines, lay and medical, have contained frequent articles upon various phases of the cost of medical care. The articles in lay magazines have been more numerous than those in professional journals, and regarding them at least, we agree that some are wise and some are foolish.

A few years ago there appeared a thought-provoking book, "American Medicine and the People's Health," a sociological study of the problem by Dr. Harry H. Moore. About the same time there was launched the five-year program of the Committee on the Cost of Medical Care. The committee was large and consisted of many prominent men and women; it was headed by Dr. Ray Lyman Wilbur, President of Stanford University, an ex-president of the American Medical Association, and now secretary of the Interior. The research was directed by Dr. Harry H. Moore. It was financed by several of the large foundations, and enjoyed the co-operation of such agencies as the American Medical Association; The U. S. Public Health Service and the Metropolitan Life Insurance Company.

The committee suggested as it began its work, that it would probably not be able to arrive at definite conclusions, but that it could only secure data and point to certain trends. It has issued many reports. Now approaching the end of the five-year period, it has made arrangements for carrying on part of its investigations, and it has made suggestions regarding the continuation of certain other studies. Space will not permit an analysis of any of the articles, or a consideration

of any of the reports of the Committee. It is to be hoped, however, that all medical men are keeping in touch with at least the main features of these discussions, whether they like them or not.

We must conclude that changes are ahead of us. How extensive the changes will be; whether they will come rapidly or slowly and whether they will be for the best interests of scientific medicine or of the public, to say nothing of the profession, do not yet appear. Much will depend upon the statesmanship of the leaders, not only in medicine, but also in sociology, economics and politics.

We must conclude also that there is much for both layman and medical man to think about immediately. The doctor, by training and experience a conservative, would say that the layman must learn how better to anticipate and provide for medical care; that he must think more of budgeting, insurance, economy and sales resistance; that as a nation we have probably gone too far in many ways in our attitude of letting the Government do it.

This is all very true, but it is still not the complete answer. It is probably supposed, and with more truth in many particulars than we like to admit, that much hospital construction and equipment is unnecessarily elaborate and expensive, that charges for some hospital services, at least, are too high; the same is thought of charges for some surgical services, and for some examinations and other services rendered by clinics or groups. It is always said that both the very poor and the well to do, get more and better medical service than those of moderate means. It is also rather generally thought that the pure pose of medical ethics is simply the protection of the profession. It is well known that some doctors do not cooperate cheerfully with legitimate and necessary public health measures. These and many other things require careful thought on the part of the profession.

H. E. F.

## NORTH AND SOUTH DAKOTA BASIC SCIENCE LAWS

It is believed that it is none too early to begin formulating plans looking to the development of a program of legislation in which the medical profession should take an active interest. While it is true that the states of North and South Dakota do not convene in legislative session for another year, it will probably be found that much time-consuming, preliminary work will be necessary and that it is none too early to suggest that the legislative committees of the medical associations of each of the states should become active.

Perhaps the major portion of the program should be to stress the necessity of the medical profession itself becoming informed, in due season, on all matters of medical legislation, and that the membership of organized medicine in the states should first be approached on this matter of education. This should be followed by contact with the group of medical men who are not affiliated with any of our societies, South Dakota being represented by 45 per cent and North Dakota by 20 per cent. This is a large and influential group and should have organization contact. Many of these men should be induced to join their local societies, thereby strengthening their own prestige and influence in their local communities, and in turn lending their influence and support to organized medicine throughout the states in the eyes of the general public. Others of this group who cannot be brought in, must be approached by personal contact.

The initial move should come from the component societies for the purpose of creating interest and dispelling the apparent lack of information in advance of the attempt to enact any medical measures into law. Organized medicine is in need of this education. The discussion should also include the necessity for the spirit of co-operation which is essential and vital in legislative matters.

With this in view, it is again suggested that each county and district society of the states should devote at least one regular meeting to the discussion of purely legislative matters and featuring, particularly, the basic science laws already operating in Connecticut, Wisconsin, Minnesota, Nebraska, District of Columbia and Arkansas. These meetings should bring out the defects, real or apparent, so far as can be determined, in the laws already enacted and operating in the states mentioned. It is believed that in this manner a Basic Science Bill might be evolved that will be workable and proof against successful attack from any angle. To carry out the full purpose

of the plan, it would seem desirable that the local societies should approach those not affiliated through committees appointed for the purpose. These committees, by personal contact or by correspondence, should present clearly and frankly the consensus of opinion and solicit their co-operation. These men outside the association should not be neglected. There are those among them who will likely be approached by our representatives on any legislation pertaining to medicine, hence the need for getting the proper information to this group.

The program should also center attention on candidates for election to the coming legislature. The candidates should be interviewed before election, and their activities scrutinized after they have taken their seats. In other words, we should keep in closer touch with our legislative activities. In justice, however, to our representatives, it should be said that they are in the main open-minded men and quite generally anxious to seek information on both sides of a measure before taking action. If mistakes have been made, which time later reveals, they are usually mistakes of judgment and not of the heart.

There is no doubt but that confusion must develop in the mind of a legislator when considering a measure, due to the fact that he is immediately confronted with opposing ideas and opinions, and when these opposing views come from the ranks of the profession itself, the best intentioned measure in the world will meet with failure.

This has been the experience of medicine in the past and it would seem that it is subject to correction, but only through intelligent action. By informing itself on legislative matters in advance, and by complete co-operation, the medical profession should be able to forestall all vicious bills that may come up, and aid materially in enacting into law those measures that are of vital interest to all the people of the state.

The states of North and South Dakota, adjacent to and with Minnesota and Nebraska, which already have in successful operation basic science laws, should form a unified block of forward-looking medicine. North and South Dakota should take simultaneous action with a well-defined program, as suggested, worked out in advance, which will result in a bill that can be confidently presented to their respective legislatures a year hence with the entire medical profession of the respective states back of it. S. M. H.

## LOWER DEATH RATE FOR 1931

The report of Dr. Louis I. Dublin, statistician of the Metropolitan Life Insurance company is

of interest to every physician. He states that the death rate among the industrial policy holders of that company for 1931 will either be the lowest on record or approximately equal to that of 1930 which was the lowest previously recorded. This lowered death rate among the large number of policy holders of this company should give one an idea of the death rate of the country as a whole. Certainly if the low death rate holds good for the general population of the country in the face of economic depression and widespread unemployment it is something upon which physicians can look with just pride. If on the other hand there is a higher death rate among the population as a whole we would do well to ask ourselves the cause and make every effort possible to remove it.

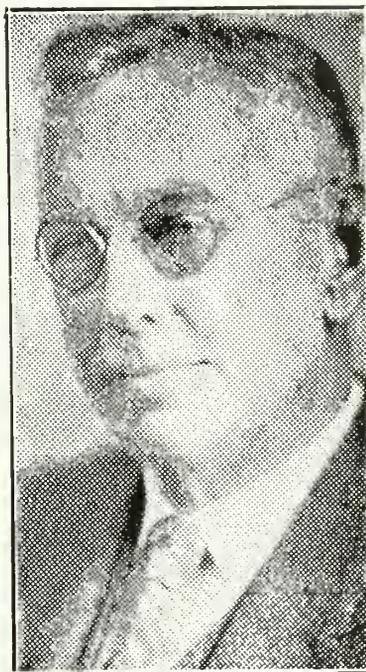
Medicine has undergone many changes during the last half century which has brought a lowered death rate. Greater efforts will be made in the future to lower it further and physicians should be the leaders in bringing this about. There are a few (a very few) who oppose any and all movements for better health and a lower death rate on the ground that it is State Medicine. These are stumbling blocks in the way of progress and are a reflection on the profession. Progressive physicians welcome anything and will aid in any way they can to promote better health and a lower death rate. They realize that in doing so they fulfill the needs and requirements of the public. Not to do so leaves the door open for other forms of medicine, be it state medicine, industrial medicine or medicine in some other form. If the physician is not willing and eager to give the best possible to prevent death and promote better health someone else will do it. Our duty is to be the leaders in showing the way of progress for better health and a lower death rate. If we measure up to it there is no need to fear any other form of medicine in this country. S. A. S.

#### HENRY LONGSTREET TAYLOR, M.D.

Henry Longstreet Taylor was born in Pennsylvania in 1857. After having completed preparatory work, he entered Haverford College and graduated in 1878. The year Koch presented his work on the discovery of the tubercle bacillus, Dr. Taylor graduated from the medical department of the Ohio University at Cincinnati. About the time of his graduation he developed malarial fever. In those days certain places were looked upon as health resorts for this disease, such as Fort Snelling, Minnesota, and Ashville, North Carolina. Dr. Taylor spent considerable time between 1882 and 1888 in Ashville. Having become a specialist in nose and throat work and be-

ing a malaria patient at the same time, he came in contact with many persons who had gone to Ashville for their health, some suffering from other diseases, such as tuberculosis with laryngeal complications.

In 1888, he made a visit to St. Paul, Minnesota, but did not return to practice medicine there until 1893. He was not satisfied to devote his



Henry Longstreet Taylor

entire time to office work, but almost immediately began to display his ability as an educator. He became deeply interested in the Northwest Lancet the same year he began practice. He was elected secretary of the staff and continued in that capacity until 1897. Indeed he used the pages of the Lancet in the institution of his educational campaign against tuberculosis and published his first article under the title of "The Necessity of Special Institutes for the Consumptive Poor" in 1893. His interest in medical education continued and he drew up plans for a library in his County Medical Society. In 1897 he became librarian of the Ramsey County Medical Society at which time he resigned his secretaryship of the Northwest Lancet. In 1899 he took an active part in the organization of the St. Paul Medical Journal and was its managing editor until it was taken over by Minnesota Medicine in 1917. For five years he was a member of the Board of Editors of Minnesota Medicine. In 1916 he was influential in starting the Minnesota Public Health Association Journal which later became the North-

west Health Journal and is now known as Everybody's Health. He had much to do with the development of this journal which now has a circulation of approximately 50,000 per month.

Dr. Taylor's interest in medical education never waned. He was Associate Professor of Medicine at the University of Minnesota for many years. In recent years, he established and maintained two scholarships in the Graduate School. In 1928, his Alma Mater, Haverford College, conferred upon him the degree of Doctor of Laws. At this ceremony, President Comfort said, "Haverford College wishes to bestow upon you as some acknowledgment of the public service you have rendered during your long career the honor of the degree of Doctor of Laws."

From 1882 to 1888 he spent considerable time at Ashville where he came in contact with many persons suffering from tuberculosis. The interest which he developed in tuberculosis at that time increased as the years passed. When Dr. Taylor began to practice medicine in Minnesota, the climatic conditions of that state were thought to be surpassed by none in the country in the treatment of tuberculosis. Henry David Thoreau had been here and in search of health had taken a steamboat trip on the Minnesota River to Redwood with Governor Ramsey. E. L. Trudeau had also been here for his health. Thus no small number of the residents of St. Paul had tuberculosis. About 1899 Dr. Taylor made an arrangement at the Ramsey County Poor Farm to care for a few tuberculosis patients in tents. So great was the need for institutional care of indigent tuberculosis patients that in 1901 he introduced a bill into the State Legislature providing for the establishment of a State Sanatorium. The same year, the Governor of the state appointed him as member of a committee to investigate the need of such an institution. He was able to convince the legislature so that, in 1903, \$25,000 was appropriated and Dr. Taylor was appointed to a permanent State Advisory Commission. As the plans for the State Sanatorium were developing slowly, Dr. Taylor opened a tuberculosis department in the Luther Hospital. Two years later, in 1905, he opened a private sanatorium in Pine City, Minnesota, which has become widely known throughout the country as the Pokegama Sanatorium. It was the first permanent institution established in the State of Minnesota for the treatment of tuberculous patients. No institution in this country excels Pokegama Sanatorium from the standpoint of excellence of treatment administered to patients.

Dr. Taylor realized his vision of a State Sana-

torium in 1907, when that institution near Walker, Minnesota, opened its doors. For nearly twenty-five years he took an active part in the development of this institution. After the State Sanatorium had been opened, Dr. Taylor saw the need of other sanatoriums for the indigent consumptives in the State, so in 1912, after having advocated the building of such institutions, he was made a member of a State Committee to draw up a bill to induce counties to construct and maintain sanatoriums for tuberculosis. During the next year he conducted a legislative campaign which resulted in the present county sanatorium law with the appropriation of \$5,000. He was instrumental in establishing the Ramsey County Tuberculosis Pavilion at the Ancker Hospital and for years he directed the medical work which was always of the highest class. When the Ramsey County Children's Preventorium was established, Dr. Taylor served as president for five years. He has been medical director of this institution since it first opened its doors to patients. He was firmly convinced that childhood is the best period in life to strike tuberculosis; therefore, he devoted a tremendous amount of time to the work among the children at the Ramsey County Preventorium. The Medical Staff of the Lymanhurst School for Tuberculosis Children found in him a loyal friend. Many times he was consulted regarding their work. Many times he participated in the programs of the Lymanhurst Medical Staff.

Dr. Taylor saw the need for public health education and took an active part in the organization of the Association for the Prevention and Relief of Tuberculosis in 1906, which later became known as the Minnesota Public Health Association. He was made a member of the Board of Directors and in subsequent years held practically all of the offices of the organization. It was his vision and his guidance of others which brought this organization from a small beginning to a high place among State Tuberculosis Associations in this country. From 1906 to 1912, he not only gave of his money and time but also supplied the services of his resident physician at Pokegama Sanatorium to aid in public work.

Dr. Taylor's activities were continually attracting attention through the nation, so much so, in fact, that in 1925 he was elected Vice-President of the National Tuberculosis Association, and in 1927 there came to him the greatest honor which the National Tuberculosis Association can bestow upon one of its members, namely, the election to the Presidency of that organization.

He was a member of the following organizations: The American Medical Association; National Tuberculosis Association; American Sanatorium Association; Climatological Society; Minnesota State Medical Society; Minnesota Trudeau Medical Society; Minnesota Academy of Medicine; Minnesota Public Health Association; Ramsey County Medical Society; Ramsey County Public Health Association.

The following is a brief list of some of his recent publications: A Message from the National Tuberculosis Association; Relapse in Pulmonary Tuberculosis; Prevention is Better than Cure; Are We Asleep at the Switch?; When to Suspect Tuberculosis; The Case for the Sanatorium; Minnesota as a Health Resort; The Tuberculosis Crusade in Minnesota.

Dr. Taylor lived in advance of his time. His vision was so keen that he was always seeing approximately a quarter of a century ahead. In other words, it required about that long for the medical profession and the public to put into practice his teachings. He was not only a man of vision, he also had that rare ability to organize for the perpetuation of projects which he first visualized and later realized. He was always a friend of the students and recent graduates in medicine. He encouraged young men in order that the good works in which he was interested might be carried on. He also possessed that rare quality of being able to change his mind. He was never so fixed in his opinions but that he could see an opposite point of view provided sufficient evidence were presented. This quality he retained until his death on January 2, 1932.

As one looks over the sketch of his life, one is impressed with the numerous excellent qualities which he possessed; indeed all of the qualities of the ideal physician and educator.

J. A. M.

#### ABSTRACT

##### The Treatment of Cutaneous Burns

ALTON OCHSNER

*International Surgical Digest. Volume II, Number 6. June, 1931.*

This is an excellent summary of an important subject and should be read carefully by all physicians, who may be called upon to treat burns.

"It is important to divide burns into two types; first, those in which there is incomplete destruction of the

skin so that epithelization may occur from islands in the burned area with little or no scar, and; second, those in which the skin and hair follicles are completely destroyed so that healing occurs only from the periphery of the wound resulting in considerable cicatrization."

One of the important local changes in an extensive burn is a marked edema of the skin and subcutaneous tissues. There are, also, important systemic changes including acute glomerulitis, inflammation associated with destruction of lymph glands, hyperemia and hemorrhage in the parenchyma of the adrenals, blood concentration and diminished blood chlorides.

Clinically there are three stages: first, the stage of shock; second, the stage of toxæmia, and, third, the stage of repair. Treatment must first combat shock by keeping the patient absolutely quiet and by replenishing the body fluids. Generous doses of morphine should be administered and salt solution given intravenously in large quantities.

When shock is not a prominent feature debridement of the wound, under anaesthesia can be done to advantage. In any case the surrounding skin should be cleansed, the burned area gently washed with salt solution and loose necrotic material removed mechanically, care being taken to guard against causing the patient any pain.

The tannic acid treatment has decreased the number of deaths due to toxæmia. A two and one-half to five per cent aqueous solution of tannic acid, solution either as a spray every fifteen minutes, or by the use of compresses saturated with the solution, is applied until the burned surface is turned a mahogany brown. When this treatment is used, however, there must be careful observation, as when infection occurs beneath the crust, free drainage is necessary. This is obtained by removing the crust and treating the wound with wet dressings of 1-5000 acriflavine or normal saline.

Systemic treatment demands large quantities of fluids, normal saline being especially valuable to counteract the loss of blood chlorides. If there is considerable vomiting intravenous administration of hypertonic saline solution (500 c.c. of 3% solution) is advocated.

Transfusions are valuable when secondary anaemia develops.

In some cases there is an initial hyperglycaemia followed by a marked hypoglycemia. The latter condition has been treated by the administration of glucose with fluids and adrenalin in large and frequent doses. However, this treatment should be given only when careful blood sugar determination is possible.

In deep and extensive burns, the wound should be prepared for skin grafting in order to diminish the resulting scar.

H. M. N. WYNNE, M. D.

## PROCEEDINGS MINNEAPOLIS CLINICAL CLUB

Meeting of November 12, 1931

The regular monthly meeting of the Minneapolis Clinical Club was held in the Lounge of the Medical Arts Building on Thursday evening, November 12, 1931. The meeting was called to order at 7 o'clock by the Vice-President, Dr. A. H. Beard, in the absence of the President.

There were fifteen active members, six senior members and one visitor present.

The report of the Executive Council meeting held at 5 p. m. was given, and minutes of the October meeting were read and approved.

Upon recommendation of the Council, Dr. R. E. Scammon, Dean of Medical Sciences at the University of Minnesota, was elected to honorary membership in the Clinical Club.

Upon ballot the following men were elected to active membership in the Club—

Dr. J. K. Anderson.....	Proctology
Dr. Archibald E. Cardle.....	Internal Medicine
Dr. William P. Herbst.....	Urology
Dr. R. E. Swanson.....	Obstetrics & Gynecology

The following scientific program was presented.

Dr. D. D. TURNACLIFF reported two cases; one on amebiasis of the skin, and the second on nickel dermatitis.

Case 1. Through the courtesy of Dr. Shillington of the Northern Pacific Hospital staff, I have been able to observe a destructive skin lesion which is clinically identical with the cases previously described as amebiasis of the skin. The circumstances were unusual, inasmuch as the lesion began while the patient was in the hospital and was observed from the time it was a subcutaneous nodule up to the time it became an ulcer 14 by 18 cm. in size. Dressings had been applied throughout this period so there was no secondary invasion; as a matter of fact, nobody has been able to get any growth whatsoever from the secretion.

The patient entered the hospital July 28, 1931, with a history of dysentery since June, 1931. On August 5, 1931, ameba histolytica were found in the stools and Yatrín was administered—9 pills daily. On August 13, 1931, a subcutaneous, purple-colored nodule was noted below the right breast, which spread peripherally. This was opened as a possible early carbuncle on August 15, 1931. No pus was obtained.

On August 20, 1931, the lesion spread subcutaneously, ulcerating in the center with no drainage to speak of. On August 25, 1931, the ulcer was 8x10 cm. in size.

I saw the lesion at this time; it was an ulcer with a dry base of muscle sheath. There was no granulating tissue; only a serous discharge. The border was elevated and undermined with an overhanging edge of necrotic skin with pus oozing from beneath it. Around the ulcer there was a zone of induration three-quarters of an inch wide; next to the ulcer the skin had a peculiar bluish or purplish tint, gradually changing to a deep red and then to normal skin. The lesion was painful to touch. The epidermis was not involved except secondarily, the chief disturbance being below the surface.

Another similar ulcer was developing above the right scapula. The central necrotic material was still present, but differed from a carbuncle in that the skin necrosed early, apparently not from pressure but from destruction of the blood supply.

Yatrín had been used (9 pills a day), and the amebae disappeared from the stools. The skin lesion was progressing, so emetin was used hypodermically and was administered from August 27 to August 31, with no improvement. On September 4, the chest lesion (14x18 cm.) was spreading rapidly, as was also the shoulder lesion (7x5 cm.).

On September 5, the border of the ulcer was excised one and one-half inch beyond the edge with the cautery knife, and down to the muscle sheath, and 95 per cent phenol was used on the base of the ulcers.

There was no further activity of the infection, and the ulcer was covered with multiple skin grafts which completely epithelialized by September 17, 1931. On this same day dysentery began again and part of the new epithelium came away, but there were no signs of return of the skin infection.

The patient was practically afebrile except for the period of August 30 to September 6, 1931. The W. B. C. was 9,500. All cultures from the lesion showed no growth, and stained sections did not show any bacteria. Examination for amebae in pus and sections will have to be listed as ques-

tionable or negative, as the experienced men did not find them and the local physician feels that he did find them. In cases reported previously the ameba disappeared from the pus when emetin was used, and inasmuch as Yatrin was used before the examinations were made, it is probable that this might have inhibited their growth.

In American literature four cases are reported of skin lesions of identical nature, in which the amebae were found before emetin was used—all in patients who had amebic dysentery. One case, reported by Engman of St. Louis in 1919, was superimposed on a generalized impetigo contagiosa. Hamberger, in 1925, reported a case of fistula in the right loin and ulcer surrounding it. Two others by Engman, in 1931, were post-operative sinuses.

I have taken the liberty of presenting this case without positive laboratory findings because of the identical nature of the lesions with those described in previously reported cases with positive findings, and because I do not know of any skin condition which produces the type of activity present in this lesion.

The characteristics of the lesions are its destruction of the corium only (not involving the muscle beneath), its extension along the corium and secondary necrosis of the epidermis.

From observation of this case, it appears that the organism causing this lesion prospers or causes lysis in the fat tissue of the corium, and it might be possible that elimination of fats from the intestinal tract would help the intestinal infection.

#### DISCUSSION

DR. C. A. BOREEN: I have nothing to add to the discussion but would like to ask Dr. Turnacliiff if amebae were found in the stools? I don't think there is any question about the diagnosis.

DR. TURNACLIFF: Yes, they were found before Yatrin was used.

DR. W. A. FANSLER: I think the preparation mentioned in treating gonorrhoea is a combination of Yatrin and casein, but what effect it has in intestinal amebiasis I am not sure. Yatrin is used in pill form and also as a solution instilled into the bowel. The effect is both local and systemic.

Case 2. The patient, a female, aged twenty-five, with no previous history of any skin trouble or sensitization reactions, purchased glasses made of white gold. Dermatitis developed back of the ears and the optician covered this area of the bows with celluloid. Later a dermatitis developed around the eyes and over the temples and the optician very ingenuously arranged the frames so none of the metal touched the skin except two

small screws through the celluloid on the supports on the nose.

Shortly after this a dermatitis developed on the skin under the areas where nickel-plated garter fasteners touched the skin. The patient did not realize what the causative factors were and continued wearing the glasses and garters with a mild dermatitis around the eyes and under the garters, for two months. An area of dermatitis developed in the flexor of each elbow, and she became pruritic over the whole body. When the metal was removed from contact with the skin, the dermatitis cleared up.

Apparently this patient was developing a generalized allergic reaction to the continued contact of nickel against the skin. She is presented because of this feature and the fact that she reacted to the nickel-plated garter fasteners. Up to date I have seen only cases which reacted to white gold, which is an alloy of gold and nickel.

#### DISCUSSION

DR. A. H. BEARD: I would like to ask if the girl had been wearing the same garters before she got the glasses?

DR. TURNACLIFF: Yes, but the white gold started the sensitization process, and she was apparently headed toward a generalized sensitization dermatitis, such as you see from horsehair, pollens, and things of that type.

DR. H. BRIGHT DORNBLASER reported the following case of tuberculous perinephritis.

This case, No. 6155, is of a young woman, twenty-three years old, divorced, who was first seen on February 25, 1930. She came in complaining of constant backache.

Her father is 60 years old and has diabetes; her mother is forty-eight, living and well; she has three sisters and three brothers living and well. One brother died at the age of fifteen, after catching a cold in an athletic game. The patient has always been well except that she had measles and mumps in childhood, and "flu" in 1918. She has headaches when she is nervous.

Her eyes, ears, nose and throat are negative. She has lost 18 pounds this last year, due to dieting. Her appetite is very good; she does not suffer from nausea or vomiting, but she does have some gas after meals. She has never had any hematemesis. Her bowels move every day with the help of a laxative which she has to take twice a week. Her stools are negative. She voids about five times a day and not at night. She has no dysuria, hematuria or incontinence. Her periods began when she was thirteen years of age and have recurred regularly every thirty days. They last for about four days, are scanty in

amount, dark in color, and do not contain any clots. She has cramps every other month. She has not had any intermenstrual bleeding and the date of her last period was February 1, 1930.

She was married four-and-a-half months; is divorced now. She was pregnant about four-and-a-half months, and said she fell down stairs (?), causing a miscarriage. She feels nervous from the trouble she had with her husband, and is melancholy and cries easily.

She dates the present illness from the time she had trouble with her husband and got a separation. She has lost her pep, can't sleep well, and she feels tired in the morning even though she tries to be in bed twelve hours each night. She was a saleswoman for five years, and during that time she felt peppy and had no trouble. After she had the flu she had backache and this has been growing worse.

The patient is well-developed and well-nourished. Her skin and mucous membranes are of good color. Her eyes, ears, nose and throat, and teeth are negative. There is no glandular enlargement. The thorax is of good size and shape, and the heart and lungs are negative. Her abdomen is negative except for tenderness in the right flank.

Pelvic examination shows outlet is op., marital, no discharge. Bartholin's glands are not felt. The cervix is conical, it has a small transverse tear, and the canal is closed and points down and back. The uterus is in the anterior position and of normal size, shape and consistency. The adnexa are negative. There is some tenderness in the left tube.

The examination of her back shows some tenderness, especially on the right side in the sacroiliac region. The tenderness seems to radiate downward and outward from the posterior superior spine.

Her weight is 124½ pounds; temperature 98.4°; pulse 80; respiration 21; and blood pressure 108/54. Urinalysis of a voided specimen shows it to be straw-color, cloudy, alkaline, albumin negative, and sugar negative. Her blood findings are as follows: r.b.c. 3,820,000; w.b.c. 8,230; hemoglobin 70 per cent; blood Wassermann negative.

Impression: I do not think there is anything in the pelvis to account for her backache. Her blood showed that she needed a tonic, which she was given, and she was told if she continued to have discomfort she should be referred to an orthopedist. Dr. R. G. Allison reported at this time that the X-rays of her spine are negative. On March 12, she was sent to an orthopedist who

told her that her posture was not right and that she should take some exercises.

The patient was not seen again for six months. When she returned in September she said she had consulted another gynecologist who had her get a sacroiliac belt. She wore this for a time without relief. She then developed some gastrointestinal symptoms and went to a gastro-enterologist for examination. In the course of his studies, X-rays were taken which showed the cecum and the ascending colon displaced to the left. The X-ray report was as follows: "Normal stomach and cap. No evidence of abnormality of the gastro-intestinal tract. Definite tumor mass, right lower quadrant, which is displacing the cecum and ascending colon sharply to the left. The right kidney is sharply outlined and this mass is definitely not kidney."

Pelvic examination at this time showed the uterus to be pulled up on the right side, and the ovary on that side could not be felt, though the tube could be palpated. On the left side the tube and ovary were normal. On the strength of these findings it was thought that the ovary on the right side was fastened up high and was pulling the uterus up on this side. She was advised to go to a hospital and have it removed. She did so, and on October 3, when her abdomen was opened through a midline incision, it showed the "left ovary bleeding from the last Graafian follicle. The right ovary was glued down behind the broad ligament. Uterus normal. Appendix was buried in adhesions behind the cecum; cecum was pushed over into midline of the abdomen by a mass which lay on the right ileopsoas muscle." No ovarian cyst was found. It was hard to tell where the mass was which had been palpated through the abdomen. With the abdomen open, there was a discussion whether or not there was a tumor mass felt on the right side where the X-ray showed the cecum to be pushed over. A needle was therefore inserted, above and lateral to the right anterior superior spine of the ilium, and 500 cc. of purulent material removed. The patient's convalescence from the operation was uneventful.

From this data we thought we certainly were dealing with a psoas abscess secondary to tuberculosis of the spine, and we therefore waited until the patient was out of the hospital to have some more X-rays taken.

On November 12, she was again X-rayed and nothing was found in the spine. We thought possibly something was overlooked, so she was again X-rayed on November 17, with the same

result. X-ray reports are as follows: "Anteroposterior and lateral plates were made covering the entire dorsal spine, and a special lateral plate was made covering the third lumbar vertebra. There is no evidence of pathology in the dorsal spine. There is some erosion of the anterior surface of the third lumbar vertebra. This, however, is due to pressure from a soft tissue mass. Conclusions: We are unable to detect any evi-

dence of Pott's disease involving the dorsal, lumbar spine or sacroiliacs. When the abscess in the right flank is again drained, I would advise the injection of a sodium iodide suspension in the hope of tracing this sinus to a spine origin."

Because of the fact that the patient was having a great deal more pain as the abscess was filling again, and the roentgenologist had advised the injection of some opaque material into the sinus,



FIG. 1

FIG. 2

FIG. 3

FIG. 4

Figures 1 and 2. Normal spine, anteroposterior and lateral views.

Figure 3. Cecum and ascending colon pushed to the left by tumor mass.

Figure 4. Abscess in right flank over the iliopsoas muscle producing pressure erosion on the third lumbar vertebrae.



FIG. 5

FIG. 6

FIG. 7

Figures 5 and 6. Anteroposterior and lateral plates showing injection of abscess cavity with sodium bromide solution which shows there is no connection between the abscess and the vertebral column.

Figure 7. Pressure erosion over second, third and fourth lumbar vertebrae.

she was sent to a hospital where, on November 19, the sac was aspirated and about 300 cc. of the same kind of pea-soup pus evacuated. A 20 per cent sodium bromide solution in gum tragacanth was introduced through the aspirating needle into the abscess cavity. A smear of this pus was stained by Gram's method and showed very numerous pus cells, but no bacteria were seen and no tubercle bacilli were found in the acid-fast stain. A guinea pig was inoculated with the pus and died of tuberculosis six weeks later. The X-ray made of the region, following the injection of the sodium bromid solution, showed no evidence of any connection with the vertebrae.

Following this aspiration and injection, the patient had quite a stormy time. Her temperature went up to 103.6° on several occasions, and she had repeated chills. She was extremely nauseated and vomited a great deal, and her skin became very darkly pigmented. This made us think that possibly the abscess was primary in the adrenal, and that we were dealing with an atypical Addison's disease. She had a moderate degree of anemia, was quite asthenic, had marked irritability of her stomach as evidenced by the nausea and vomiting, and had bronzing of her skin. Her heart action was very good. Pigmentation was on the skin only, both on the exposed and covered surfaces, but there was none in the mucous membrane of the mouth, nor were there any patches on the mucous membrane of the vagina. The patient never had any feebleness or irregularity of her heart action, and never any attacks of vertigo or syncope. She stayed in the hospital until December 5, when she was discharged in fairly good condition.

The abscess refilled quite rapidly and she was advised to have it aspirated again. On December tenth she entered a hospital where 900 cc. of the same material were removed, and on the twelfth a complete cystoscopic examination was made. A catheterized specimen of urine from the left kidney was light amber in color, clear, neutral, specific gravity 1010, albumin 1+, sugar negative, casts negative, epithelium occasional, pus cells 1—2, red cells 25—35. On the right there was not sufficient quantity to test the specific gravity. There was a trace of albumin, no sugar, no casts, and only occasional epithelial cells. There were 2—4 pus cells, and 20—30 red blood cells. An intravenous P. S. P. was done and the readings after one-half hour showed 1.25 per cent right, and 1.5 per cent on the left; with overflow 9 per cent, making a total of 11.75 per cent. Check reading on the total amount of urine showed 12 per cent output. The specimens from the right

and left sides were centrifuged for a half hour and smears made from the sediment. Acid-fast stains from this material were negative for tubercle bacilli. Cultures of the urine on broth and agar were negative for both the right and left sides. On the next day a check on the P. S. P. was made by giving an intramuscular injection, and this showed the output for the first hour 30 per cent and the second hour 17½ per cent, making a total of 47½ per cent excretion.

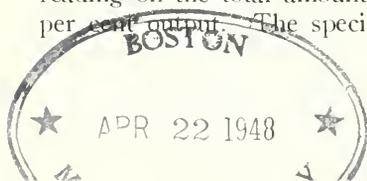
Pyelograms made during the cystoscopic examination showed a normal condition on both sides. The report was as follows: "Pyelogram was made of both kidneys. Neither of the sides is enlarged or deformed. The left kidney presents an entirely normal appearance. The right calyx presents a fuzzy appearance. This is apparently due to a slight over-distension."

The patient left the hospital after four days, feeling quite well. The cavity filled up again very rapidly, and she re-entered the hospital on January 16, 1931, and had the cavity aspirated again. 500 cc. of the same material were evacuated. She was discharged from the hospital the next day.

She was seen again on January 23, and said she was feeling well. She was advised to take some ultra-violet ray treatments, and this she has been doing very faithfully. X-rays of her spine on this date showed erosion of the second, third and fourth lumbar spines from pressure of an abscess cavity outside the spine.

The report is as follows: "Stereoscopic antero-posterior and lateral plates of the lumbar spine. Antero-posterior and lateral plates of the dorsal spine were made. These show the shadow of a large abscess lying just to the right of the second, third, and fourth lumbar vertebrae, particularly the third. There is a spur of new bone extending out from the anterior margin of the third lumbar vertebra, and to a lesser extent the anterior and superior margins of the fourth lumbar vertebra. The normal lordotic curve has been partially destroyed, and there is a tendency toward kyphosis in the upper lumbar spine. The bones of the dorsal spine show a normal condition. Conclusions: There is definite evidence of erosion in the anterior portion of the bodies of the second, third, and fourth lumbar vertebrae, particularly the third. This has the appearance of a pressure erosion from the abscess without. There is a slight degree of kyphosis involving the upper lumbar vertebrae."

On December 31, 1930, the patient brought us a 24-hour specimen of urine, the sediment of which was used to inoculate a guinea pig. The



report from the laboratory on Feb. 13 said that the autopsy showed all organs free from tuberculosis.

On Feb. 25, she made an office visit, at which time she seemed to be very much better. The abscess sac was not filling up very rapidly, and she was advised to let it alone until it contained more fluid. At this time her blood pressure was 116/78. Her red blood count was 3,610,000, and hemoglobin 80 per cent. The pigmentation of her skin was very much decreased and she said she was feeling quite like herself. Her appetite was good and she was sleeping twelve hours every night.

She was again seen on March 3, 1931, and was advised not to have the cavity aspirated. April second was the last time she was in the office. At that time she had increased a good deal in weight, was feeling well, her appetite was good, and her blood showed r.b.c. 4,350,000; w.b.c. 10,250; hemoglobin 85 per cent.

The questions still unsettled are: (1) How did she get her infection? (2) Where was the primary infection? (3) Is one animal inoculation enough on which to base a diagnosis of tuberculosis?

#### DISCUSSION

DR. S. R. MAXEINER: I remember a case we had a few years ago at Government Hospital, number 68, which was rayed and re-rayed. That man had a psoas abscess which was aspirated repeatedly. It was two or three years before we found the focus of infection. He had tuberculosis of the vertebra, and the abscess was a typical psoas abscess, the source of which could not be located for about three years.

DR. H. M. N. WYNNE: I examined a patient in 1923 who had a similar lesion. She was thirty-six years of age, married and the mother of three children. A few weeks before, she began having pain in her back which continued and gradually grew worse until, at the time I saw her, she was incapacitated and had lost fifteen pounds in weight.

I found a cystic mass in the left abdomen which I believed to be retroperitoneal. I thought that she had Pott's disease, but X-ray films showed no involvement of the bone. She returned to the clinic where she had been treated before I examined her. Cystoscopic examination and pyelograms were said to show no evidence of disease of the urinary organs. She later went to another clinic where an exploratory laparotomy was performed and a retroperitoneal cold abscess found and aspirated. Her husband was told there was no involvement of the bone.

(Note.) I have just talked to this lady over the telephone. She tells me that she wore a back brace for three months and has been very well for the past seven years, weighs 180 pounds now and does all of her own work for a family of six children.

DR. A. H. BEARD: Was the blood pressure low at any time?

DR. DORNBLASER: No, not especially. We thought of Addison's disease because of the pigmentation that developed.

DR. BEARD: The nausea and vomiting did not develop at the same time as the pigmentation, did they?

DR. DORNBLASER: Yes, they did.

DR. J. M. HAYES: Were there any lymph nodes palpable anywhere?

DR. DORNBLASER: No, there were none.

DR. MACNIDER WETHERBY (by invitation) discussed the subject of Arthritis and showed numerous lantern slide charts of results of treatment being carried out at the University Dispensary.

H. BRIGHT DORNBLASER, M. D., Secretary.

#### TREATMENT OF WOUNDS

JAMES M. HAYES, M. D.  
Minneapolis, Minn.

Perhaps no other period in medical history afforded more exhaustive and detailed study of wounds than did that of the World War. Our recent observation of wounds presenting at the out-patient department of the University Hospital does not lead us to believe that the valuable knowledge gained during this period is taken advantage of to any great extent at the present time.

When we consider the loss of time due to improper treatment of minor wounds it arouses us to the realization that this is a field of therapy that should receive more attention.

No definite set of rules can be established to cover the treatment of all wounds. Only by close observation of the wound from time to time can the method of treatment be well advised. Every wound passes through a number of stages in the process of healing and usually requires changes of treatment as the character of the wound changes.

Originally wounds differ vastly in their character and consequently in the method of treatment. Practically all wounds except those made by aseptic surgery should be treated as infected wounds from the outset. Cleanly incised, punctured, lacerated and contused, or wounds in which considerable epithelium has been brushed or burned away all call for vastly different treatment.

The cleanly incised wound if treated immediately may be very readily made sterile by a superficial application of some antiseptic such as iodine, mercurochrome, alcohol or calomel powder. If the wound has not received immediate attention then the infection may have penetrated more deeply into the tissues and a superficial, temporary antiseptic is not adequate.

The puncture wound such as caused by a nail or other blunt point should always be treated as a deeply infected wound. The superficial application of any antiseptic gives only a false assurance of protection. The blunt point carries the infection deep into the tissues and as the instrument is withdrawn the tissue closes as a trap door behind, thus protecting the bacteria from temporary superficial antiseptics.

In the lacerated or contused wound the bacteris are usually ground or forced into the tissues and thus protected much the same as in the puncture wound.

NEWS ITEMS
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{ We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession. }

Dr. B. H. Sprague has returned from Los Angeles and is again in active practice at Huron, S. D.

Dr. Lennox Danielson has become associated with his father in general practice at Litchfield, Minn.

Dr. T. M. Morrow, Scobey, Mont., has moved to Plattville, Wis., and opened offices for general practice.

Dr. Chas. W. Froats, St. Paul, has been added to the staff of the Bratrud Clinic at Thief River Falls, Minn.

Dr. W. J. Stock, formerly in practice at Waconia, Minn., died last month at the Ft. Snelling Veteran Hospital.

Pierre, S. D., will have a \$375,000 Federal Indian Sanitarium located in that city in the early spring of 1932.

Dr. M. L. Samms, medical officer of the U. S. Veterans' Hospital at Fargo, has been transferred to Cincinnati, Ohio.

The Powell Hospital located at Sisseton, S. D., is again open for patients, having recently been remodeled and redecorated.

Dr. D. C. Frise, Minneapolis, died from a sudden attack of heart disease on January 10th. Dr. Frise was 45 years of age and a graduate of the Northwestern Medical College.

Dr. A. C. Dean, Hot Springs and Miss Grace J. Hansen, Huron, S. D., were recently married at Omaha, Neb. They will continue to reside at Hot Springs.

Dr. Frank Myers, Green Springs, Ohio, passed away on January 1st, at the age of 33 years. Dr. Myers was a former resident of Minneapolis and a brother of Dr. J. A. Myers.

The Brigham Hospital, Watkins, Minn., has been opened again with Dr. F. T. Brigham, a practicing physician for the past 25 years in charge.

Dr. R. H. Ray, Garrison, N. D., entertained the members of the McLean County Medical Society at their regular December meeting. No important business was transacted.

Dr. Kee Wakefield, Minneapolis, celebrated his 89th birthday recently. Dr. Wakefield has been a resident physician since 1856 and is well known in all sections of Minnesota.

Dr. W. A. Bates, president of the South Dakota State Medical Society, has named Dr. M. C. Johnson, Aberdeen, as a member of the Editorial Board of the Journal-Lancet.

Dr. George J. Hathaway was elected chief of staff of St. Mary's Hospital, Duluth, succeeding Dr. Charles W. Giesen. Dr. H. A. Sincock has been named Vice-President and Dr. E. A. Myers, Secretary.

Dr. Thomas B. Hartzell, Minneapolis, is in Washington, attending a conference of special committees called by Surgeon General U. S. Cummings, for a research on questions pertaining to public health.

The Sioux Valley Medical Society will hold their annual meeting at Sioux City, Iowa, on January 26 and 27th. An interesting program has been arranged and a large attendance will be present.

Dr. J. W. Dickey, Ft. Pierre, S. D., died on December 31st after a short illness. Dr. Dickey had been a resident of North Dakota for over forty years and was prominent in church and charity work. He was 83 years of age.

Dr. J. A. Myers, chairman of the board of editors of the Journal-Lancet, was one of the principal speakers at the annual meeting of the American Students Health Association, held in New York City, last month.

Dr. Leonard G. Rowntree, professor of medicine at the University of Minnesota and senior consultant in medicine and director of clinical investigations at the Mayo clinic for many years,

has been chosen medical director of the Philadelphia Institute of Medical Research.

Fargo's United States Veterans hospital has the third largest percentage turnover in patients of any in the country, according to reports to C. T. Hoverson, regional veterans bureau manager. During 1931, the hospital has admitted and treated 596 patients.

Dr. O. F. Melby of Thief River Falls, was elected President of the Red River Valley Medical Association, which held its annual dinner and meeting at Crookston last month. Dr. H. H. Hodgson, Crookston, was named Vice-President and Dr. C. L. Oppegaard, Crookston, Secretary-Treasurer.

Dr. H. J. Herman, aged 63 years, who has practiced medicine in Day county for 40 years, died at Webster, S. D., last month. He commenced the practice of medicine in Waubay and 28 years ago moved to Webster. He was superintendent of the county health board for many years.

Dr. John C. Smith, Thompson, N. D., a 76 year old pioneer physician of that town, who had practiced medicine in that vicinity since 1887, passed away last month. Born December 26, 1855, at Southmont, Ontario. Graduated in 1887 from the Toronto University medical school and moved immediately to Thompson.

Dr. B. T. Bottolfson, Moorhead, was re-elected president of the Clay-Becker Medical Society at the annual meeting and dinner, December 16th. Dr. J. H. Heimark, Moorhead, was re-elected Secretary. Dr. M. W. Comfort, Rochester, a member of the Mayo Clinic, addressed the 35 physicians from Clay and Becker counties, and Fargo, on "Liver Lessons."

At the January meeting of the Sioux Falls Medical Society the following program was presented: Dr. J. C. Ohlmacher of the University Medical School, Vermilion, gave a talk on "Some Fundamentals and Distinctive Pathology of Cardiovascular Disease," and Dr. J. B. Gregg, Sioux Falls, spoke on "Foreign Bodies in the Lungs."

Dr. E. S. McMahon has been chosen president of the Silver Bow, Montana Medical association. Other officers of the association are: Dr. W. A. Reichle, vice president; Dr. A. W. Morse, treasurer; Dr. C. R. Canty, treasurer; Dr. S. V. Wilking, Dr. Lee W. Smith, Dr. W. A. Reichle, Dr. D. K. Worden and Dr. E. S. McMahon, trustees. The new officials plan a busy season for the association during the coming year.

Dr. Robert Mowry Bell, graduate of the University of Minnesota, and holder of an M. D. degree from Harvard and of a Ph. D. degree from Leipzig University, Germany, died at his home in Crystal Bay. He had been ill several months. Dr. Bell was 71 years old. He came to Minneapolis from Sewickley, Pa., in 1875, for some years he taught at Princeton University and at Clark College. He retired because of ill health, and had been living at Lake Minnetonka for 18 years.

Dr. M. R. Williams, Cannon Falls, was elected President of the Goodhue County, Minn., Medical Society at the annual meeting held last month. He succeeds Dr. Donald Clayton, Red Wing. Dr. G. O. Fortney, Zumbrota, was elected Vice-President; Dr. L. A. Steffens, Red Wing; re-elected Secretary-Treasurer; Dr. M. W. Smith, Red Wing, elected a delegate to the state society's meeting and Dr. M. H. Cremer, Red Wing, named censor. The doctors decided to secure more motion picture films for post-graduate work here, adding to the supply secured during the past year.

"The annual meeting of the Cass County Medical Society was held at Fargo, Tuesday evening, December 29th. The program consisted of an annual address by the President, Dr. Frank I. Darrow, Fargo, on a "Review of Recent Advancements in Medical Science" and a paper on "Nephrosis," by Dr. A. C. Fortney, St. Paul. The following officers were elected for 1932: President, Dr. A. C. Morris, Fargo; Vice-President, E. M. Watson, Fargo; Secretary-Treasurer, Dr. B. K. Kilbourne, Fargo; Dr. R. E. Weible, Fargo; Board of Censors: Dr. Frank I. Darrow, Fargo; Dr. T. H. Lewis, Fargo, and Dr. W. F. Baillie, Fargo, were elected delegates to the State Medical Society."

Dr. Boyd T. Williams, who for 20 years has maintained a cancer sanitarium in Minneapolis, was sentenced to pay a fine of \$1,000 or to serve one year in the Workhouse in Minneapolis by the Judge of the District Court of Hennepin County. Williams paid the fine. Defendant had been under arrest for sometime following the filing of a complaint against him by Mr. Brist representing the State Board of Medical Examiners. Williams was charged with practicing healing without a Basic Science Certificate. When Williams was brought before the Court to receive his sentence he informed the Court that he had closed his place and had removed his sanitarium to Hudson, Wisconsin, which fact has been verified by the State Board of Medical Examiners. This is the third time that Williams has been convicted of violating the Medical Laws of this State since the enactment of the Basic Science Law in 1927.

### BOOK NOTICE

RECENT ADVANCES IN THE STUDY OF RHEUMATISM, Poynton, F. J., M.D., and Bernard Schlesinger, M.D. P. Blakiston's Son & Co., Philadelphia, 1931. 313 pages. Price \$3.50.

A monograph on "Recent Advances in Rheumatism" is of great value at this time because of the intense interest in this subject. Through the stimulation of the American Committee for the Control of Rheumatism there has resulted a remarkable renewed interest in all phases of this subject. Various universities and research institutions throughout the country are carrying on research in the field of rheumatic fever and chronic arthritis. I know of no subject so complicated and contradictory as this one, and no one is more capable of reviewing the recent progress in rheumatism than Dr. Poynton. It will be remembered that Dr. Poynton, many years ago, called attention to the relationship of streptococcae to rheumatism. He has repeatedly upheld his original impression, and it must be a source of great satisfaction to him to notice more and more convincing evidence to substantiate his original idea.

This monograph of only three hundred and thirteen pages, making up a volume easily carried in one's pocket, is a most complete and unusually sane review of the entire subject. The authors are deserving of a great deal of credit for having picked out the important facts from the tremendous amount of recent literature on the subject.

The book is divided into three parts: Part I. on Nomenclature and the Industrial Aspect of Rheumatism. Attention is called to the misleading and confusing terminology and the possibility that all types of Rheumatic Infection from Acute Rheumatic Fever to Osteo-Arthritis may be simply different manifestations of the same process, the main difference resulting from varying age responses to the same disease. Various statistics from Europe and America reveal the great loss of time and suffering from rheumatism, as well as tremendous loss of money due to the resulting disability. Part II. comprising the greater part of the volume, is a complete discussion of Rheumatic Fever. One is impressed with the great amount of work done on this subject by American workers. The subject is discussed from every possible point of view. Considerable progress has been made on the pathology of acute rheumatism and chorea, indicating that rheumatic fever is not merely a disease involving the joints, cardiac valves, and brain tissue, but that the entire body is involved in the process.

Slow but steady progress is revealed in the bacteriological approach to the subject. All the more recent work is thoroughly and clearly discussed. Much of this work is still controversial, but there appears to be consensus of opinion that the streptococcus is probably the casual organism. The numerous statistical resumé's are considered. The newer theory of Allergy in its relation to acute rheumatism is simply and clearly discussed, and should be of help to anyone approaching this subject for the first time. All types of treatment are considered, including vaccine and nonspecific therapy, as well as the latest treatment of chorea with nirvanol. Convalescent care of patients with rheumatic fever is considered in detail and will answer many questions in regard to the use of long-continued bed-rest for children with active rheumatism.

Under vaccine therapy, the authors question the advisability of widespread use of stock material, and point out the fact that all workers using vaccine, whether stock or autogenous, stress the point that minute doses must be used, as when larger doses are utilized the patient becomes hypersensitive. This is interesting in view of Clawson's recent work on animals which verifies this opinion. Apparently the use of autogenous vaccination in rheumatic fever had not come to the attention of the authors when this book went to print. Many of the questions raised by the authors are answered in the work done recently by Clawson.

Part III. concerns study of the chronic arthritides. Here again the authors have produced a most excellent and complete resumé of the subject. It calls to mind the fact that Poynton has repeatedly stated that one group of investigators should study the whole field of rheumatism and that the work should not be divided into sections. It is only in this manner that a correct perspective can be obtained of the whole subject. The similarity between the various aspects of rheumatic fever

and the chronic arthrides is stressed. Under treatment no mention is made of intravenous use of vaccine. A chapter on Spa treatment and surgical procedures in chronic arthritis completes the volume.

Dr. Poynton and Dr. Schlesinger have given us a most valuable, timely and complete resumé of a subject that they are most capable of discussing. The book is more than a resumé; it is a conservative and able discussion of the whole subject.

M. J. SHAPIRO, M.D.

GEHIRNPRÄPARATION, MITTELS ZERFASERUNG, by Dr. J. Wilhelm Hultkrantz, published by Julius Springer, Berlin, 1929.

This is a pamphlet of thirty-five pages with forty-four illustrations describing a method for studying brains microscopically. This method apparently has been improvised for students in neurology. The author suggests that the brain to be studied should be fixed in formalin for from two to four days; washed in water and then placed in Kaiserling's fluid for two or more weeks. It is then soaked in 95 per cent alcohol for from twenty-one to twenty-four hours and placed in a solution containing two parts glycerine, one part potassium acetate and ten parts water. The author believes that by this method the brain is well preserved, and it can be easily dissected. With diagrams and illustrations he clearly shows the method of procedure in dissecting the brain so that all important structures are easily approached and clearly defined.

N. J. BERKOWITZ, M.D.

SURGICAL CLINICS OF NORTH AMERICA. Number 4, Volume XI, August, 1931. Number 5, Volume XI, October, 1931. W. B. Saunders Company, Philadelphia, Pa.

These are the regular issues of this publication. The first is the Mayo Clinic number and contains a wide variety of material ably presented. Of especially timely interest is the contribution of Learmonth and Kernohan on Epidermoid Cyst of the Brain, with detailed report of three cases.

The second issue is the Pacific Coast Surgical Association number, with valuable contributions from clinicians in California, Oregon and Washington.

Both of these numbers are well up to the high standard established by this periodical, which appears every other month throughout the year. It is an important and practical channel of contact for those desiring to keep informed of the advances in surgery throughout the country.

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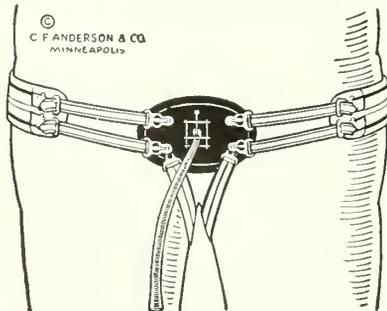
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## MISCELLANY

### SUBSEQUENT COURSE OF FORTY PATIENTS WITH ACUTE "DRY" PLEURISY

MARSHALL N. FULTON, Providence, R. I., and RICHARD G. HAHN, Boston (*Journal A. M. A.*, Dec. 26, 1931), review the records of 639 patients with pleurisy. One hundred and forty-nine of these were acceptable as instances of acute dry pleurisy. The subsequent history of forty of the latter during a period averaging seven years has been obtained by correspondence or examination. In four of the patients pulmonary tuberculosis developed, in three of them within one year after the acute pleurisy. The remaining thirty-six are in good health. The authors believe that while one should appreciate the likelihood that an acute dry pleurisy may be an early manifestation of tuberculous infection, their study suggests that pulmonary tuberculosis is apt to develop in fewer of the cases than has been taught previously.

### ONYCHOLYSIS: AN INDUSTRIAL DERMATOSIS

H. J. TEMPLETON, Oakland, Calif. (*Journal A. M. A.*, Dec. 26, 1931), reports five cases of onycholysis. The patients were new employees, apparently healthy, who developed black spots under their fingernails within

forty-eight hours after beginning work washing paste from labeled bottles. Within a few days the nails loosened from the nailbeds at these areas. The process was without symptoms. The nails regrew in from four to six months. Investigations revealed no specific industrial irritants at fault. The author believes that the disorder was precipitated by maceration of the tissues by prolonged immersion in water plus, possibly, the mechanical insult to the tips of the fingernails from picking at resistant pieces of paste. But back of all of this, in his opinion, was some personal factor which made the nails separate from the nailbeds more easily than would those of normal individuals.

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From a study of 600 cases of goiter, ARNOLD S. JACKSON, Madison, Wis. (*Journal A. M. A.*, Dec. 26, 1931), draws the following conclusions: The blood picture in hyperthyroidism does not vary essentially from that in the normal person. The differential blood count in hyperthyroidism is not of diagnostic and prognostic significance. There is not a definite relationship between the blood picture and the basal metabolic rate. The lymphocyte count is not varied by an increase or a decrease in metabolism. The blood count is not influenced by the severity of the disease, considering metabolism and weight loss as paramount factors. A secondary anemia is not typical of hyperthyroidism. A leukopenia is not characteristic of hyperthyroidism. Sex and age do not influence the blood picture in toxic goiter. In spite of clinical improvement, no appreciable change was observed in the blood count following the use of iodine in hyperthyroidism. The only appreciable change in the differential blood count in goiter was observed following thyroidectomy for exophthalmic goiter. An increase in the polymorphonuclear count and a decrease in the lymphocyte count occurred. The author does not believe that the blood picture in hyperthyroidism is of any practical clinical importance.

MENINGITIS CAUSED BY FRIEDLÄNDER'S  
BACILLUS

According to KARL ROTHSCHILD, New Brunswick, N. J. (*Journal A. M. A.*, Dec. 26, 1931), cases of meningitis caused by *Bacillus mucosus-capsulatus* (Friedländer's bacillus) are usually fatal. Only three cases in which the patient recovered have been reported; in all these the diagnosis is not satisfactorily confirmed. The author presents a case in which Friedländer's meningitis was associated with a subdural abscess, following mastoiditis. The same micro-organism was found in cultures of the abscess and of the spinal fluid. By bacteriologic tests the micro-organism was identified as *Bacillus mucosus-capsulatus* (Friedländer's bacillus), with the characteristics of the most frequent type of this group. The patient recovered completely, representing the first case with recovery reported in the American literature and the first nonfatal case in general in which definite bacteriologic tests were made. A survey of the literature is also presented.

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## The Medical School of the University of Minnesota

RICHARD E. SCAMMON, Ph.D.

*Dean of Medical Sciences, University of Minnesota  
Minneapolis, Minn.*

**T**HE Medical School of the University of Minnesota was established nearly fifty years ago through the consolidation under university control, of several pre-existing medical colleges in the Twin Cities. Since that time it has formed an integral part of the university.

The school occupies a beautiful stretch of high placed ground, covering approximately seven acres, extending from Washington Avenue, the chief highway between Minneapolis and Saint Paul, to the cliffs overlooking the Mississippi River. Here its grounds become continuous with those of the Minneapolis Park Board so that there is a broad stretch of rolling woodland and meadow to the banks of the river. This fortunate location was secured through the efforts of the alumni and other public-minded citizens some twenty years ago. To the west, separated by a narrow street, are the buildings of the conjoint sciences of Botany and Zoology.

Figure 1 (as shown in Dr. Litzenberg's article on page 70 in this issue) is an architect's drawing of a bird's-eye view of the Medical, Dental and Nursing buildings as they will appear when the structures now under construction, or authorized, are completed. It may be regarded as a fair representation of physical structure of our school as it will appear in the spring of 1933. The buildings are divided into two great main units, the laboratory-dentistry group, forming a shallow quadrangle facing north to Washington Avenue, and a larger and more extended hospital

quadrangle continuing north from the cliffs overlooking the river. It is hoped that these two quadrangles may be joined in the future by covered passageways.

The construction is highly uniform, a modified Georgian, with rather severe lines fitted well to the purpose of the school and to concept of simple and direct accomplishment that forms its ideal. The new Nurses' Home, for which the plans are drawn, is colonial. All of these buildings are fire-proof and are of ferroconcrete construction, faced with tapestry brick and trimmed with Bedford limestone.

The laboratory-dentistry group is made up of three buildings which, after closing a single small gap will constitute a continuous structure. Millard Hall (Figure 2), the unit to the east, is used for a variety of purposes. The building consists of a basement, mainly above ground, three main floors and a large roof house. Most of its space is occupied by the various physiologic sciences—physiology, biochemistry, pharmacology, and bacteriology. Minor areas are occupied by certain divisions of the State Department of Health, by the administrative offices of the Medical School and Nursing School, and a few laboratories for several clinical departments. The roof house of this building is used as animal quarters.

The School of Dentistry, which occupies the central position in this group, is now in the process of completion. It will be occupied by the School of Dentistry, and will have lecture rooms



FIG. 2—MILLARD HALL

common to both medical and dental schools and the administrative offices moved from Millard Hall. The roof house will form an addition to the animal quarters in Millard Hall. It is hoped that with the shifting of certain units to this new building, it will be possible to provide quiet and comfortable study quarters for students in Millard Hall.

The Institute of Anatomy (Figure 3), the third and most western element in this group, is an L-shaped structure. It consists of a sub-basement containing storage space and refrigerating machinery, a basement, three main floors and a temporary roof house. The basement is used largely for service purposes, including certain special laboratories, a photographic shop, workshop, wax-modeling rooms and the like. The first main floor is occupied by the Department of Pathology, the second and third floors are devoted to the several divisions of the Science of Anatomy, and the roof house is used as animal quarters and a skeleton room.

The Hospital quadrangle is described in a separate article by the Hospital Superintendent, Mr. Paul H. Fesler. It may be added that this group of structures contains the offices of the various clinical departments, the student health service, the X-ray department, several lecture

rooms and a few laboratories for clinical investigation. The last addition to these laboratories is a small but well-equipped chemical laboratory for the Department of Pediatrics. The new nurses' home that will adjoin the hospital and be connected with it by a tunnel will provide housing for approximately 275 people and will include proper reception and recreation rooms.

The school is, I think, relatively well equipped for teaching and research. Perhaps its most notable lack, as is the case with most American schools, is the absence of an adequate teaching museum.

The University of Minnesota has been fortunate in its medical library. Due to the efforts of Dr. Henry Nachtreib and Dr. Conway Mac-Millan, the printed material in the fundamental sciences was accumulated a number of years ago at prices that are but a fraction of the present values. Several years ago a policy was inaugurated of systematically adding the various clinical journals. This program has been generously supported by the central administration of the university. In general, it is the policy of the institution to build up, first, the sets of periodicals, second, the monographs in the various branches of medical knowledge and third, to provide text books. As a result, the medical library is probably the best one between Chicago and the Pacific Coast. Four hundred and seventy-five current medical periodicals are carried at the present time. The library is housed in special quarters along with the collections of books in biology and dentistry and is available to members of the profession as well as to the student body and faculty.

The pre-clinical branches are organized in five departments: anatomy, pathology, physiology and biochemistry, pharmacology and bacteriology. The clinical departments are medicine, surgery, pediatrics, obstetrics and gynecology, and ophthalmology and oto-laryngology. Radiology, now divided between the hospital organization, the Cancer Institute and the Department of Medicine, is as yet without formal departmental organization, although in practice this subject has essentially a departmental status. Dermatology and neurology are divisions in the Department of Medicine and urology and orthopedics are included with surgery.

The Department of Preventive Medicine and Public Health forms a link between the clinical and pre-clinical subjects. It is housed in the division of the Hospital devoted to the Student Health Service. Practically all teachers of the pre-clinical departments are full-time members of

the university faculty, and the majority of heads of the clinical departments are also full-time faculty members. Most of the clinical departments have also one or more full-time clinical associates. However, the school deems itself fortunate in having upon its faculty a large number of clinicians engaged in active practice who relate the more academic phases of medicine to the art of medicine in private practice. The devotion of these members of the faculty, few of whom receive compensation in proportion to their services, is gratefully appreciated.

The organization of the school, though somewhat unique and on paper comparatively complex, is in fact simple and direct. There are two deans, a Dean of the Medical School who is responsible for curricula, student affairs and programs, admissions and examinations, and a Dean of Medical Science, concerned with general policies, faculty, finance and the relations of the medical school to conjoint branches in the university. Both are responsible to the President of the University and to the Board of Regents. The Dean of the Medical School is assisted in his duties by a member of the faculty dealing with student admissions, a medical school examiner, and a student work committee. There is an Executive Faculty, with a smaller advisory committee, and also a General Faculty consisting of all the members of the teaching staff above the rank of assistant.

Approximately one hundred students are admitted to the medical school each fall. A supplementary number averaging about forty enter in the winter when the laboratories are free to accommodate an additional group of men. Students are admitted only after completion of at least two full years of college work, including specified courses in physics, chemistry, foreign languages and biology. They must have evidenced a specified standard of scholarship in this pre-medical work. Citizens of Minnesota are always given preference and although a few students from outside are accepted, this is never done until the children of the state are provided for. The number of students has increased greatly in the past decade and the future policy of the school regarding admissions is under discussion.

The medical course consists of four years of regular work leading to the degree of Bachelor of Medicine, and a fifth year in an approved hospital, or a fifth year in advanced laboratory work, is required before the degree of Doctor of Medicine is conferred. The selection of interns is under the charge of Dr. Jennings C. Litzenberg,



FIG. 3.—EAST FRONT AND ENTRANCE TO THE INSTITUTE OF ANATOMY

to whose diligence and attention the success of the intern year is due. In a general way, the first two years are devoted to the laboratory pre-clinical subjects and the last two years to intensive clinical study. A few preliminary clinical subjects are included in the sophomore year.

Final examinations are held at the end of each year. These are under the charge of a special examination committee. Dr. A. T. Rasmussen, working with appropriate committees, prepares and reads all examinations with great care. Examinations are read "blind," i.e., the examiner does not know the name of the student whose paper he is reading. A most valuable feature of these examinations is a review period of one or two weeks preceding them. In this interval the student has an opportunity to organize and consolidate his knowledge. The annual comprehensive examination system which has now been in effect about two years is, in the opinion of the majority of the staff, one of the most significant educational advances that the school has made in recent years.

Clinical instruction is given, not only in the University of Minnesota General Hospital, but also in the Minneapolis General Hospital, the Glen Lake Sanatorium of Hennepin County and the Ancker Hospital of Ramsey County and the City of Saint Paul. The school maintains several full-time members of the faculty in the first-named institution. The wealth of clinical material, as well as its special character, available in these institutions and the instruction rendered by their staffs form a most valuable and appreciated adjuncts to the school's facilities. Without these opportunities and the cordial relations of the administrators and the staffs of these hospitals, the clinical departments of the school would be sorely crippled.



LABORATORY FOR TOPOGRAPHIC ANATOMY



ANATOMY AMPHITHEATRE

Many of the special features of the school's activities are described in accompanying papers, but a few may be briefly mentioned. They include the wealth of fresh autopsy material made available through the school's large autopsy service (about 2,100 necropsies in the year 1931), the great opportunity for the study and treatment of cancer provided in the Cancer Institute, supported largely through the Citizens' Aid Society and Mrs. George Chase Christian, the preliminary clinical demonstrations for first-year and second-year students, and the clinical staff meeting, conducted by Dr. William O'Brien, and the numerous seminars and clinical conferences held in the several departments. Equally important

is the close relation that the school has always held with the remainder of the university. The advantages of the general University Library, the opportunities of consultation with scholars in other branches of science, and the use of other department laboratory facilities at the university cannot be over-estimated. Perhaps no other university medical school has a closer relation with conjoint branches of the university, and I am sure no medical school profits more from them. And finally, one should call attention to the increasingly close relationship between the school and the body of practitioners of the state which forms the basis and measure of the success of any state institution.



MEDICAL LIBRARY, UNIVERSITY OF MINNESOTA

## The School of Medicine of the University of North Dakota

H. E. FRENCH, M.D.

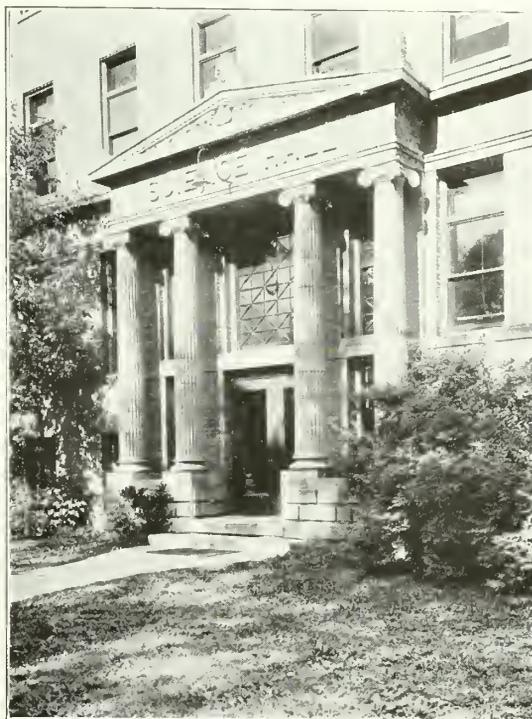
*Dean School of Medicine, University of North Dakota,  
Grand Forks, N. D.*

SINCE North Dakota was one of the states that came into its development rather late, it escaped the period of "wildcat medical schools" which characterized medical education in the United States throughout much of the Nineteenth Century. Tradition has it, however, that at least two abortive attempts were made to start a medical school in the state. One of these efforts should probably not be spoken of as traditional, since the territorial legislature in 1887 appropriated one thousand dollars to provide for a Medical College at the university. The organization of the college on paper, and the appointment of a dean, seem to be the only steps taken. The other effort seems to have been only a technical organization in another part of the state in order that a group of medical men might more easily secure and make use of certain anatomical material.

The school as it now exists was organized in 1905 and "opened its doors for the matriculation of students on September twenty-sixth" of that year.

Back of its organization was a feeling of obligation on the part of the men at the university, the members of the medical profession, and other leaders in the state. The obligation was for the state, through its university, to do its share in this important field, both for the youth of the state who were desirous of preparing themselves for medical service, and for the people who are the final beneficiaries. The first bulletin announcing the new school of medicine stated that "over fifty young men and women have been compelled to leave their own commonwealth in order to secure even the first and second years of medical training." It went on to indicate the cost to these young people in terms of fees and other expenses of that day.

In addition to this feeling of obligation, and to any possible feeling of ambition, it can be said that the early years of the present century saw the beginnings of the upheaval that was soon to make the remarkable changes in medical education which are familiar to all. It was not that everything in the old order had been bad, but that the group of sciences, which together represent scientific medicine, had developed to such an extent



SCIENCE HALL, UNIVERSITY OF  
NORTH DAKOTA

that the older organization, a multiplicity of poorly-equipped proprietary schools, was no longer adequate.

One of the early requirements in the attempt to secure better training of doctors was that four years of time, forty-five months, between matriculation and graduation must be spent in a recognized medical school. In general the requirement was good, and it was designed to correct certain evils of the time. But before this many of the best candidates for medicine were men who had spent from two to four or more years in some college or university, often doing advanced work in chemistry and biology, including bacteriology, embryology and histology, and who then secured advanced standing in these subjects in some medical school, and sometimes completed the required curriculum in less than the standard four years. This, at its best, involved much better training in the subjects in question than could be

found in many of the medical schools, but it was contrary to the requirement. Hence there was an argument at once for the two-year school.

Moreover leaders in education, both general and medical, had come to realize that the principles of education are the same everywhere, and that the laboratory medical sciences could not be handled well without budgets and organizations comparable to those of other laboratory departments in the universities. The urge was strong, therefore, for medical schools to secure university affiliations; for these affiliations to become more serious than many then were; for universities to take vigorous hold of the laboratory medical sciences; and for the smaller universities, which could not conduct a complete school, to organize and provide for at least the laboratory courses of the medical curriculum.

Perhaps the most striking object lesson, at least to the universities of the Middle West, was the University of Chicago, which after its affiliation with Rush Medical College, began in 1899 to offer the first two years of medicine on its campus several miles from the clinical departments.

At any rate, at a time when many medical schools were consolidating or going out of existence, and while many schools were experimenting with divided campuses, North Dakota was one of nine new two-year, or half-schools, to be launched within a few years of each other. The group was joined by three others which had abandoned clinical work, and later by a few others temporarily, or during the process of becoming established; the last-mentioned and a few others have since established clinical departments; one attempted to do so and receded. There are now ten two-year schools; no school of this kind has failed to continue.

It might be wondered, since the demand was slight and the beginnings so small, if the university might not better have kept out of the field of medical education. The writer is quite convinced that it is neither necessary nor desirable for every university to attempt to do everything that some other university does. Spheres of influence might well be much better recognized. But he is also convinced that scientific medicine is so important to all of the people, that most of the state universities should undertake to do their share by offering instruction and research in the laboratory sciences—at least. In reply to the argument of small beginnings, it should be pointed out that the same might be said of most, if not all, schools

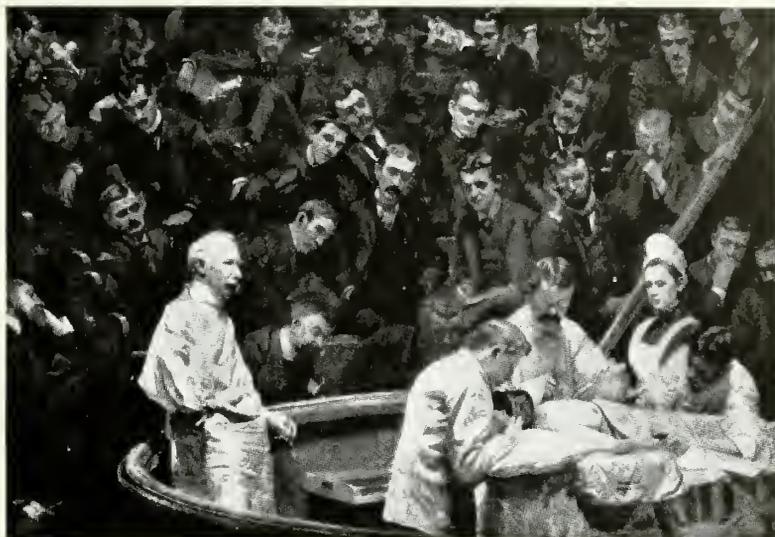
and colleges of every kind and of all other institutions.

The School of Medicine was organized by Dr. M. A. Brannon, at that time professor of biology in the university. He became the first dean, and served in that capacity for six years; he was later transferred to the deanship of the College of Liberal Arts, and is now chancellor of the University of Montana. Though not a graduate of medicine himself, he had a very clear conception of what is required of the doctor, and of the requirements for his training. Most of the changes that have been made from time to time in the requirements for admission and in the curriculum have been matters of detail, or such as have been dictated by the efforts at standardization which began to operate about the time he left the school.

With Dean Brannon's name in the faculty of the "Medical College," University Catalogue of 1905, are the names of President Merrifield and of many of the general faculty of the university. For purpose of organization, the suggested pre-medical Liberal Arts courses and the proposed courses in medicine proper were considered as one curriculum. Incidentally, it was not until the Catalogue of 1918 was issued that the names of instructors giving premedical courses, but not courses strictly medical, were omitted from the list of the faculty of the School of Medicine. But never has the essential unity of the curriculum been overlooked. In the first list of faculty members are also the names of Drs. H. M. Wheeler, John D. Taylor, and August Eggers, practitioners of Grand Forks. Anatomy and physiology were offered by Dr. A. L. McDonald, an alumnus of the university, a recent graduate of Johns Hopkins University Medical School, and at that time a young practitioner in Grand Forks. Dr. McDonald has practiced his profession in Duluth for many years. Embryology and bacteriology were given by Dean Brannon, and histology by Miss Kildahl, an instructor in his department.

Dr. J. E. Hetherington, who later received his M.D. degree from Jefferson Medical College, and who has been practicing in Grand Forks for many years, and is now the instructor in physical diagnosis, seems to have been the first student to matriculate in the new school. Others whose names appear as students in the year 1905-06 are Dr. Thos. B. Lude and Dr. Thos. Ziskin, now of Minneapolis.

Dr. Sverre Oftedal, who graduated in 1909, was the first to receive the "Certificate in Medicine," evidently completing what the early catalogues called the "long courses." Dr. Oftedal practiced



DR. AGNEW'S CLINIC  
*Photograph by Metropolitan Museum*

in Fargo for many years and has recently moved to California.

Earlier students of the university, as well as all of the older practitioners of the state, will remember Dr. G. F. Ruediger who came to the school in 1907. Dr. Ruediger was professor of bacteriology and pathology for many years, and was the organizer of the State Public Health Laboratory. He now resides in Pasadena, California, unfortunately in poor health. Other members of the faculty who came about the same time were Dr. R. T. Young, for many years professor of biology who conducted the work in embryology and histology, and Dr. Geo. H. Caldwell in the combined departments of physiology, pharmacology and physiological chemistry.

The writer came to the school in 1911, at the time Dean Brannon was transferred to the College of Liberal Arts, and Dr. McDonald left the university and Grand Forks for practice in Duluth. He found a faculty pretty well indicated above. He found also a group of twelve medical students proper, divided between the two classes, about twenty premedical students, and the traditions of the students of the years before, by that time taking clinical work in other schools or beginning practice. The work of the school, except for the introductory clinical courses, was all done on the third and the attic floors of Science Hall; the third floor also housed the State Public Health Laboratory.

Space will not permit even the naming of all of the students who have begun their medical training here, great as is the temptation to do so.

Many, however, have already established themselves in enviable positions of service and income. In the same way the changes in the faculty, unfortunately too many and due to the low salary scale, cannot be noted.

The numbers of students entering from year to year, graduating, and finally going on to other schools, grew steadily, except for a slight falling off in the war years, until about 1925. Admissions, total enrollments, and numbers completing two years of medicine in a few typical years are as follows:

Year	1st Year Admissions	Total Enrollments	Graduates
1911-12	6	12	5
1915-16	13	23	8
1921-22	22	42	18
1925-26	26	48	17
1929-30	29	60	30
1931-32	28	55	..

The figures above simply give an impression. They have been taken from university catalogues. It has frequently happened, however, that at the close of a year some student was also a candidate for the M.S. degree, or that some student, not quite through, would complete his work and receive his diploma later; in neither case would his name appear in the lists from which the last column above was made; corrected figures for this column would sometimes be from one to three greater.

Since 1925 the school has attempted to limit its first year admissions to 30. Two or three times it has been crowded above this figure; when the number of admissions has been less it means

that accepted candidates have failed to come. Somewhat fewer are to be expected in the second year. As a general rule no transfer students are accepted. The policy of limiting the admissions as above gives a group in each class that can be handled as one section, and that quite fully occupies the room and equipment. So far, at least, it has taken care of all well-qualified applicants from the state—at least if they have made themselves known early—and sometimes for a very few others.

In selecting students, next to residents of the state, preference is given to applicants from western states and territories in which there are no medical schools, and to residents of the neighboring counties of Minnesota, and sometimes to others, if they have been enrolled in one of the North Dakota schools for their premedical work. It is interesting to note that for several years the school has received annually from two hundred to four hundred applications for admission which could not be considered at all. These applications are from non-residents who usually represent one of two groups; those attracted by the nominal fees, and those unable to secure, or fearful of not securing, admission elsewhere.

While the work of the school has remained in Science Hall, the growth in numbers has required it to occupy the second floor in addition to the space it had twenty years ago. Physiological Chemistry has been offered in the Chemistry Building for many years. The Medical Library has been moved to the University Library.

The minimum entrance requirements for admission to the school remain essentially as they have been for over twenty years, and are well known. It is interesting to note that students, as a part of the changing conditions of the times, are voluntarily taking considerably more premedical work before presenting themselves for medical entrance. Out of one hundred and fifty new admissions, covering the total first-year matriculations for the last five years, fifty-six had the B.A. or the B.S. degree; another fifty-six had three or more years (ninety or more semester hours) of college work; thirty-eight had something less than three years; and only ten had but little or nothing above the minimum—between sixty and seventy semester hours.

As is well known, all students of the school must transfer to some other medical school in order to complete their clinical work if they are to continue in medicine. There are no affiliations; that is, no school stands able and willing by any formal agreement to accept with junior standing

students who have completed the curriculum offered here. But to date no student who has graduated in the two-year course at North Dakota has failed to find an opportunity to go on, nor has any lost credit or time. If the student group were to be canvassed at any time, it would be found that three-fourths or more hope to finish at one of the Chicago schools, a few are ambitious to go to Harvard, Pennsylvania, or other particular schools and a very few have little or no preference. It has always worked out that just about half of each transferring class are accepted at Rush and Northwestern; the others are widely scattered. The schools that have now from one to fifteen or twenty North Dakota students still doing their third and fourth years work are: Colorado, Northwestern, Rush, Indiana, Kansas, Louisville, Johns Hopkins, Harvard, Tufts, Minnesota, St. Louis, Creighton, Nebraska, Oregon, Pennsylvania, Jefferson, and Vanderbilt.

In general there has never been any difficulty in placing the men whose grades rank them in the upper two-thirds of the class. While the placement of a few men in the lower one-third is usually slow, as said above, no student who has finished the work in North Dakota has failed to secure admission with advanced standing elsewhere. In the same way, only one such student has failed to complete the course in some other school. So far as is known not one who has graduated in medicine has failed before a State Board.

The tabulation that follows is from a recent letter from Dean Ernest Irons of Rush. It shows at a glance something of the work and relative standings or grades of ten students who transferred to Rush in 1930. Names are omitted.

Name	Average First Two Years Work Done at N. D., (Averages Determined by Admissions Committee of Rush From Transcripts.)	Average to Date at Rush. (Work of Third Year.)	
_____	B	C	2.96
_____	B+	B—	3.73
_____	B	B+	4.65
_____	B—	B	3.81
_____	B	B	3.91
_____	B+	B	4.06
_____	B—	B	3.76
_____	C	C	2.67
_____	B	A—	4.77
_____	C+	B	3.91

This is only one typical report; it needs no comment.

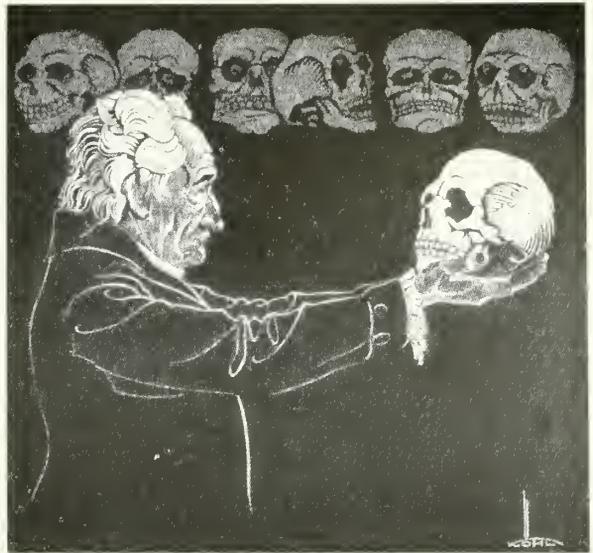
As another example of what the students of the

school can do, it might be said that seven of the graduates of last year voluntarily took Part I of the National Board Examination in June. Six passed the part completely, four with averages of 81.5 to 84.5; one made what the Board calls a partial failure, in that he did not make the required average of 75 and must write on certain subjects again. Moreover, the group that wrote is a representative section of the class, containing one or more from each of the three scholarship thirds; it did not contain the two members of the class with the highest averages.

The question is sometimes asked if the graduates come back to North Dakota for practice. A glance at the records shows that there are at least forty practitioners in the state who took their first two years of medicine at the university, a very satisfactory showing; there are about ten others in the neighboring counties of Minnesota. Still others have practiced for variable lengths of time in the state, but have moved away. In addition to the facts that the school is still comparatively young and its graduating classes small, there are two other difficulties in the way of a very large alumni group locating nearby; the student must go out of the state to finish his training, and there must be at least three years between the time he has finished the work offered here and the time he is ready to think of a location. For sentimental and political reasons it is satisfactory for a school to point to a large alumni group in its territory, but to give the point very much weight would be quite as foolish as to maintain seriously the very opposite point of view.

Teachers of the laboratory sciences should be interested in investigation, and the men of the school have always had their research problems. They have been handicapped by lack of facilities and heavy teaching schedules, but several have been called to better paid positions because of their ability in research, and several promising research men have been developed among the students. The department of physiology under Dr. Talbert, has for several years received a grant from the National Research Council to enable it to carry out certain important investigations.

Unlike many of the medical schools of the country, North Dakota has not shared in the generous, almost extravagant, expenditures for buildings and equipment that have been so common for the last fifteen years. It is one of the schools that has had to carry on with very modest provisions in every way. Its support has been from the state, which has had many calls for every dollar it has had to spend. Aside from a prize offered by the



GOETHE WITH SKULL.

By R. Kohl from 'The New Woodcut'

Grand Forks District Medical Society, another prize offered for a few years by Dr. J. H. Moore of Grand Forks, and a few gifts of books and apparatus, it has received nothing from private sources.

Not having the work of the clinical years, a school lacks little, if anything, that enables it to do work in the laboratory sciences. It escapes many of the problems of the larger schools; it must meet others the same as they. It has a problem of its own in placement, or outlet for its students, at once a handicap and a challenge to good work.

What of the future of the school? Will there continue to be a place for any two-year school? Will it ever be a complete school? It will not do to prophesy, but a few considerations may be discussed briefly.

As a two-year school its continued existence will obviously depend upon about three conditions: first, support in at least the present measure; second, its continuing to prepare students in the work it undertakes in such a way that they will merit favorable consideration by the larger clinical schools; third, the organization and conditions in those schools remaining such that they are able to accept transfer students. It would seem that the work is so important that the state would not let it cease. So far as an outlet is concerned, the conditions seem to be as favorable now as they have ever been; in fact they are better than has been feared at various times. Just what future developments may be cannot be foretold.

The writer should be glad to see the school develop clinical departments, even if it were still

necessary to have some of the work supplemented in larger clinical centers. If adequate provisions could be made, a somewhat larger part of the whole curriculum could be offered to the decided advantage, not only of students, but of the profession and of the people of the state. It would require money, but not at all the lavish expenditures that have been made in many places. At present it seems out of the question.

It may be that the opposite argument is correct, and that so far as we can now foresee the future of the state, North Dakota should not look forward to having a complete medical school. Possibly the work of the first two years, well provided for, is the reasonable share to expect from a state of the wealth, population, and social conditions of North Dakota. Even if the state were able, or if private sources could be found, to build and equip an ideal plant for a complete school, with the population conditions that will probably prevail in North Dakota for many years to come, there would most likely be an inadequate amount of clinical material in several important branches; obstetrics, emergency surgery, the acute infectious diseases, and an out-patient department. Moreover, political ideas of geography should probably not be stressed so much as they are. Minneapolis and St. Paul belong to Minnesota politically; economically, and in perhaps every other way, they belong to a much wider terri-

tory. The wealth and population of Chicago depend upon much more than the state of Illinois. Larger cities than North Dakota will probably have for many years to come, not only possess the abundance of clinical material but they have the wealth that can more easily provide for its hospitalization and use. Possibly this is "sour grapes," since the prospects for a complete school are no nearer now than they were twenty years ago. It simply means that the problem is difficult at best.

If and when the state is able to take any further steps in providing hospitalization for the tuberculous, for crippled children, for psychiatric cases, or for any condition in which the primary consideration is not custodial care, it should locate and plan such institutions as may be needed with reference to the possible development of the School of Medicine. Many states much larger than North Dakota have found such planning not only economical but desirable from every point of view. Mistakes have been made elsewhere, and many states are now engaged in programs of correction. Such planning and locating of hospitals can be no mistake, even if there is never to be any further development of the school. When it does seem necessary or desirable for the school to undertake a larger function, certain planning that the state should have done will mean much to all parties concerned.



ENTRANCE TO CAMPUS, UNIVERSITY OF NORTH DAKOTA

## The School of Medicine of the University of South Dakota\*

*Edited by J. C. OHLMACHER, M.D.*

*Vermilion, S. D.*

THE School of Medicine was established and began work in the Fall of 1907. Under the able management of Christian Peter Lommen, its first Dean, and with the advice and consistent friendship of Drs. F. A. Spafford and Thomas Cruickshank, the courses were outlined and the standards placed at that high level of attainment which has characterized the entire history of the institution. Dr. F. A. Spafford was at that time a member of the Board of Regents, and was always a sincere friend, not of the Medical School alone, but of the entire university.

While the fall of 1907 is given as the date of the official opening of the School of Medicine, still its introduction on the campus was the result of a gradual growth rather than an innovation. During the preceding years several of the courses given in the first two years in all medical schools had been given at the University of South Dakota, and it was only necessary to add certain other courses in order to qualify as a two-year medical school. The courses already given were chemistry, histology, embryology and physiology, and to these were added courses in anatomy, bacteriology, pathology, materia medica and pharmacology, and the course in physiology was somewhat amplified. Only one new teacher, Dr. H. E. French, was added to the faculty at this time. A second teacher, Dr. Thomas Cruickshank, was added in 1908, and a third, Dr. Mortimer Herzberg, in 1909. During the many years preceding installation of the Medical School, students from our university had been admitted to such leading medical schools as Rush and Northwestern University with advanced standing in chemistry, histology and embryology.

The first faculty of the School of Medicine consisted of C. P. Lommen, Dean and Professor of histology and embryology; A. N. Cook, Professor of chemistry; A. L. Haines, Instructor in chemistry; Dr. H. E. French, Professor of anatomy and physiology; and O. O. Stoland, Instructor in physiology. To provide for a course in materia medica Dr. Thomas Cruickshank was added in

1908, and in 1909 Dr. Mortimer Herzberg took over the departments of bacteriology and pathology and became the first director of the State Health Laboratory.

Christian Peter Lommen, until his death on July 8, 1926, faithfully and efficiently served the school as its Dean and professor of histology and embryology. Under his supervision it developed and prospered, and its work became recognized by all of the medical schools of the country. It was inspected by committees representing both the American Medical Association and the Association of American Medical Colleges and placed in class "A," under a grading system which classified medical schools into "A," "B" and "C" groups. Dean Lommen was beloved by all who knew him for his high ideals, friendly and sympathetic attitude, and scholarly attainments, and his passing was a blow to medical education in South Dakota.

A joint achievement of Dean Lommen and Dr. Spafford was the establishment and location of the State Health Laboratory on the campus of the university. The farsightedness of these two men relative to the State Health Laboratory has resulted beneficially to both the people of the state and to the School of Medicine. Large sums of money have been saved yearly through combining the functions and laboratories of the State Board of Health with those of the department of bacteriology and pathology, and the people of the state have been assured that the personnel in this laboratory would be chosen for purely scientific reasons. The Medical School has profited by its close association with the health problems of the state, brought to it by the laboratory, and many of the materials sent to the laboratory for diagnostic purposes have been of use to the students in the department of bacteriology and pathology.

Dr. Harley E. French for four years ably conducted the departments of anatomy and physiology, and in the spring of 1911 resigned to become the Dean of the Medical School of the University of North Dakota. For a period of one year the department of anatomy was conducted by Acting Prof. C. F. McClintic, at present professor in charge of anatomy at the University of Detroit at Detroit, Michigan, and since the fall of 1912, Dr. G. R. Albertson had been in charge

\*This whole manuscript, with but a few minor additions and changes, was prepared for the educational number of the Journal-Lancet by Dr. G. R. Albertson sometime before his death, and it is only at the request of Dr. J. A. Myers, chairman of the Board of Editors of the Journal-Lancet that Dr. Ohlmacher becomes identified with its publication. (J. C. O.)



THE ANCIENT PROFESSOR OF MEDICINE

of the department. Upon the death of Dean Lommen, histology and embryology were added to the department of anatomy, and Dr. Albertson became the Dean of the School of Medicine, which position he most ably filled up to the time of his sudden death on November 3, 1931.

Dr. Mortimer Herzberg, a man of great organizing ability, came to the university in the fall of 1909 as director of the State Health Laboratory and professor of bacteriology and pathology. Under his direction both the State Health Laboratory and the department of bacteriology and pathology grew in size and importance and it was with great regret that, in the spring of 1917, his resignation was received. After an interval of one-half year, during which time Dr. B. R. LeRoy was in charge, the position held by Dr. Herzberg was filled by Dr. J. C. Ohlmacher, who is continuing in a very satisfactory manner the work begun by Dr. Herzberg.

In the early history of the school the department of physiology was under the supervision of Dr. Harley E. French. Following the departure of Dr. French, this department passed successively through the hands of Mr. Earl M. Young, Mr. H. O. Lussy, Dr. O. O. Stoland, Dr. M. H. Rees, at present dean of the Medical School of the University of Colorado, Dr. E. J. Van Liere,

Mr. R. W. Girard, and Dr. Helen Bourquin. Since the fall of 1928 Dr. H. V. Atkinson has been in charge of the department. In the fall of 1913 biochemistry was removed from the department of chemistry and placed in the department of physiology, where it remained until the spring of 1922, at which time it was returned to the department of chemistry.

The course in physical chemistry, formerly conducted by Dr. Arthur M. Pardee, has been incorporated with the course in biochemistry now being given by Dr. Edwin H. Shaw, Jr., with additional credit being given in this course.

To keep abreast of the modern trends in medical education, courses in physical diagnosis and surgery, obstetrics and medicine have been added to the curriculum since the beginning of the school. These courses are conducted by Doctors S. M. Hohf, Edwin L. Perkins and William Jepson, respectively. A course in clinical pathology is being instituted this year (1931-32) under the direction of Dr. J. C. Ohlmacher.

An increasing number of autopsies are provided each year through the hearty co-operation of the authorities of the State Hospital for the Insane and the Sacred Heart Hospital of Yankton. Furthermore, a great abundance of histo-pathological material and considerable gross material are now provided the department of pathology through arrangements recently made between the director of the State Health Laboratory and several of the largest hospitals in South Dakota.

For the past several years it has been necessary to limit the enrollment in the School of Medicine to the teaching capacity of the faculty and to the quarters and equipment available. The school has fared very well in the matter of quarters. Several years ago the State Health Laboratory and the department of bacteriology and pathology were moved to new and commodious quarters in the new chemistry building, and in 1925 the space originally occupied by the University Museum was remodeled and turned over to the department of anatomy. The department of physiology at this time also came into possession of a large additional room adjacent to the old quarters. The school is in possession of all necessary equipment and more is being added from time to time as funds become available.

The history of our graduates presents several items of interest, and we have yet to learn of one who has not succeeded in his chosen work. Many have achieved local fame, and to some has come national and even international reputations. Dr. Henry Hanson, who had his early training here

before the establishment of the Medical School, but who was accepted at another medical school with advanced standing, has earned an international reputation because of his work in the control of yellow fever. In fact, Dr. Hanson is one of the outstanding authorities in the world on yellow fever. Dr. L. A. Fletcher, of the class of 1913, was for some time the personal physician to the late Major General Leonard Wood, Governor General of the Philippines. Dr. D. A. Mills, of the class of 1917, has achieved an international reputation by his work on the control of hemorrhage through the use of a serum which he developed in the laboratories of the University of Cincinnati School of Medicine. After holding a position in the department of internal medicine of the Rockefeller School of Medicine in China, Dr. Mills again returned to this country to accept a professorship in internal medicine in the University of Cincinnati. Dr. Alton B. Ochsner of the class of 1918, after a very thorough training

which ultimately took him to the medical centers of Europe, returned to this country and, after a year as assistant professor of surgery at the University of Wisconsin, accepted the professorship of surgery at Tulane University.

About 15 per cent of the students who have completed the two years of medical work here have returned and located for practice in South Dakota.

Several scholarships have been founded for students in the School of Medicine. These scholarships are given on the basis of scholarship, need and character. While only the first two years of medical work are at present being conducted in South Dakota, our students affect a material saving each year from the average cost of medical education for these two years, and it was the hope of the late Dean Albertson, that, in the not too distant future, the full four-year course of medicine might be instituted in South Dakota.



THE OPHTHALMOLOGIST

From Georg Bartisch, *Ophthalmodouleia or Augendienst*,  
Dresden, 1583.

# The Development of the Medical School of the University of Minnesota During the Last Decade

JENNINGS C. LITZENBERG, M.D.

*Professor and Chief, Obstetrics and Gynecology of the Medical School,  
University of Minnesota  
Minneapolis, Minn.*



MEDICAL, DENTAL, AND NURSING BUILDINGS AS THEY WILL APPEAR IN 1933

*From architect's drawing.*

**T**HE development of the medical school of this university, from its earliest history, has kept abreast of the times—sometimes even setting the pace of medical education in the country. The progress of medical education, from the pioneer private medical school to the modern school of medicine in a university, is as great as the progress in transportation from the covered wagon to the automobile. Identical forces have determined both—the constant effort to improve last year's model. It is impossible to understand the developments of the last ten years without some knowledge of the occurrences of the three previous decades, for accomplishments of these later years are, in reality, the fruition of efforts which began with the birth of the school.

## *The Founding of the Medical School*

A history will not be attempted. Dr. Richard Olding Beard has done that in his two excellent addresses, bringing the history of the school up to 1921. The writer is indebted to him for most of the historical data in this paper. There are certain pertinent facts, however, which it is necessary to recall because each of them made succeeding events possible and marked the progress toward the modern medical school.

So necessary has each step been to the success of the next, that it would almost seem that all had been planned by some orderly mind from the beginning, therefore each succeeding generation of the faculty must have been animated by the

same ideals—the constant improvement of medical education.

This spirit was manifest at the very beginning when, in February, 1888, representatives from the private medical schools, the St. Paul Medical College and the Minnesota Hospital College, of Minneapolis, appeared before the Board of Regents of the university, offering to surrender their charters and properties (temporarily) and petitioned the Board to organize a College of Medicine and Surgery. A short time later the Minneapolis College of Homeopathic Medicine and Surgery requested to be included.

The Regents organized the Department of Medicine, which included the Colleges of Medicine and Surgery, the Homeopathic College of Medicine and Surgery, Dentistry and Pharmacy. Dr. Perry H. Millard, of St. Paul, was made Dean.

To Dr. Millard, the moving spirit, and to those pioneer teachers who with unselfishness, wisdom and patriotism, laid the foundation for university control of medical education, the state owes everlasting gratitude. In Millard Hall is a tablet commemorating Dr. Millard's services; a companion tablet should be placed in memory of his co-founders of the medical school.

#### *The First Buildings*

Actually making the medical school an integral part of the university occurred in 1893, when old Millard Hall, on the main campus which is now the College of Pharmacy, was occupied. For the five years after the organization of the College of Medicine, it occupied the small building of the Minnesota Hospital College, opposite St. Barnabas hospital and was conducted not much differently than the private schools which preceded it. With the occupation of old Millard Hall, development of the medical school really began.

#### *The First Full-time Teachers*

Up to this time all teaching, even the laboratory branches, was done by general practitioners, devoted, forward-looking men, who foresaw the necessity for full-time teachers in the medical sciences. In the late eighties and early nineties the first full-time men began teaching in the medical school. Dr. Charles Bell, Professor of chemistry and toxicology, was the first full-time man, coming in the late eighties. Dr. Bell died in 1903. Dr. Thomas G. Lee came in 1891 as instructor in histology, bacteriology and urinalysis. The following year he was made professor of histology, embryology, bacteriology and clinical microscopy. His many duties were grad-

ually reduced, as other full-time men were brought in. He was the first research worker in a medical school, which is now noted for its contributions to science. In 1908 he was made director of the Department of Anatomy and at the reorganization, in 1912, professor of comparative anatomy. Dr. Lee remained a valuable and loved member of the faculty until his retirement, at the age limit, in 1929. The esteem and affection of his colleagues, alumni and friends was attested at a testimonial dinner, commemorating his retirement in 1929, when he was toasted as the first research worker, builder, wise counsellor and our good friend "Tommy" Lee.

Thus was laid the foundation of the present strong departments in the basic sciences, of which every Minnesota man is proud.

In 1895 Dr. Frank F. Wesbrook came as full-time professor of pathology and bacteriology. Dr. Charles A. Erdmann, in Anatomy, had always given more time to the university than to his private practice and went on full time in 1910.

#### *Building Expansion—First Period*

Building expansion has occurred in two periods; the first on the old main campus and the second on the new medical campus. The first building, in addition to old Millard Hall, was the long low wooden laboratory, dubbed by the students "The Bowling Alley."

In 1895 the old laboratory of medical sciences was built, which housed pathology, bacteriology, histology and embryology for ten years, until in 1905 the Institute of Pathology and Public Health was built. This ended the first period of building expansion. The old building then was occupied by the dental college, which had been in old Millard Hall. Dentistry is soon to vacate this building for the new building of the Medical Sciences, now being built between the new Millard Hall and the Institute of Anatomy.

#### *Increased Requirements for Graduation*

Ever mindful of the expanding responsibilities of medical practice, the builders of the medical school have, from the beginning, increased the requirements for graduation by lengthening the medical course and demanding better preparation for entrance, especially in the fundamental sciences. It is interesting to note the steps in this progress and how the constant effort to "improve last year's model" has actuated each change.

When the medical school opened, the course was three years of six months each, which in 1890 was increased to eight months and in 1901 to

nine months. In 1894 the course was lengthened to four years.

The increase of entrance requirements at first were minimal, gradually increasing, until 1900, when entrance demands were made the same as to all other departments of the university. However, better preparation was encouraged as far back as 1898, when a seven-year course was offered, leading to the degrees of Bachelor of Arts and Doctor of Medicine. In 1903 a six-year course was announced, leading to Bachelor of Science and Doctor of Medicine; at first this was optional, but in 1908 two years of college work was made compulsory.

The end of the second decade of the medical school marked the final unification of medical education under university auspices, by the absorption of the Medical School of Hamline University.

#### *Building Expansion—Second Period*

The dream of a teaching hospital of its own on the campus had become a nightmare during the long wait since 1905, when the Elliot bequest was made for that purpose. In 1909 a glimmer of hope flickered before our eyes when three of the old frame dwellings on the new campus were opened for hospitalization of patients, with the high-sounding name "THE UNIVERSITY HOSPITALS."

But dreams do come true!

In September, 1911, the Elliot Memorial hospital was opened.

The next year, 1912, the new Millard Hall and the Institute of Anatomy were occupied.

#### *Internal Development*

The school was now well housed, so the university authorities turned more attention to internal development. The first step was re-organization of the faculty, initiated by President Vincent, who facetiously remarked that: "The faculty of the medical school is limited only by the physicians listed in the telephone directory." The seriously avowed purpose was to reduce the faculty to a more workable body by having fewer teachers, each giving more time, and to secure greater productivity in research. All members of the faculty resigned and a new faculty was selected chiefly from the old faculty by a committee appointed by President Vincent and headed by Dean Wesbrook. Two chiefs were brought from other institutions: Dr. C. M. Jackson, from the University of Missouri, as professor of anatomy and Dr. A. D. Hirschfelder, from Johns Hopkins, as professor of pharmacology.

Whatever heartaches were created, some of them inevitable, some of them unnecessary; whatever mistakes were made, and there were a few serious ones, the fact remains that the "reorganization" marked the beginning of new and rapid improvements in the school.

At the beginning of the next school year, September, 1913, when Dean Wesbrook resigned to become President of the University of British Columbia, Dr. E. P. Lyon was called from the University of St. Louis, as Dean and professor of physiology.

Dean Lyon faced a difficult task indeed, what with the wounds of reorganization still tender and the duties of guiding a school undertaking a "new order of things." His were not ideas of revolution; he had no belief that he had been called to make a poor school a good one, but rather to help improve a school already strong. He felt that one of the urgent needs was greater productivity, more contributions to knowledge. We have here the keynote of his advocacy of more and better full-time men.

In 1914 Dr. Frank C. Todd fathered the idea of Teaching Fellowships, which Dean Lyon and all chiefs of departments enthusiastically supported. The establishment of three-year fellowships in the medical school was the beginning of graduate work in medicine. The Mayo Foundation proposal for graduate work at Rochester was adopted by the medical school faculty in 1915.

Another means of strengthening the teaching was suggested by Dean Lyon, in 1914, who proposed a revamping of the curriculum by reduction of lecture hours, increase of clinical teaching, the introduction of certain hours reserved for electives and a reduction of the total number of curriculum hours. The year 1915 witnessed a further improvement in clinical teaching by the removal of the dispensary from the old "Seven Corners" location to more commodious quarters in Millard Hall on the campus.

This decade was characterized by the building expansion, the strengthening of the teaching in all departments, particularly of the personnel in the basic sciences, and the marked increase in research, and by internal development.

"Then came the war."

The depletion of the faculty and student body by the formation of Base Hospital No. 26 made the period of the conflict very difficult for the medical school, but we, like the English, finally "muddled through."

*The Medical School Since the War*

We can appreciate the post-war developments in the medical school better if we look at them in the light of foregoing events, as a part of the whole, as a result of what would almost appear to be a preconceived plan. Such steady, step-by-step progress during three decades could not occur, were men during all these thirty years not actuated by the same influences, which have become a tradition, the tradition of constant improvement: "To improve last year's model"

*Full-time Teachers*

By the beginning of the third decade of the medical school the faculties of the basic sciences had been greatly strengthened, both in quality and numbers, all on a full-time basis and the trend toward full-time teachers in the clinical branches began.

Dr. James E. Moore had already gone on full time, and before the war, Dr. Leonard G. Rowntree had come from Johns Hopkins to head the Department of Medicine. Teaching Fellows, although in junior positions, had added a full-time flavor to all departments. Dr. Julius Parker Sedgwick, who had been Chief of the Department of Pediatrics, on part time since the reorganization, became a full-time professor. When he died, in 1923, he was succeeded for a few weeks by von Pierquet, of Vienna, followed by Dr. Frederick C. Rodda as Acting Chief, serving part time until Dr. Frederick W. Schlutz was chosen, on a full-time basis. Dr. Schlutz remained until 1929, when he was called to Chicago University. Again Dr. Rodda demonstrated his loyalty by consenting, with fine spirit, to step into the breach made by Dr. Schlutz's resignation.

He served as Acting Chief until Dr. Irvine McQuarrie, from Rochester University, came as full-time Chief. He has proved to be an outstanding investigator and teacher. When Dr. Rowntree resigned, 1920-21, to go to the Mayo Clinic, Dr. S. Marx White was made Chief of Medicine, on increased, but part-time basis. Dr. White resigned the chiefship in 1923, to devote more time to private practice, remaining, however, on part time. He was succeeded by Dr. Hilding Berglund, who came to the university from Harvard. When Dr. Moore, Professor of Surgery, died in 1918, Dr. Arthur C. Strachauer was made Chief, serving part time. He resigned in 1927, but was requested to remain for three years. At the same time Dr. Owen Wangenstein was chosen to head the Department of Surgery, three years hence, after he had completed the

foreign study which he had planned. He returned from Europe, and in January, 1930, assumed charge of the department, on full time. He has with him, also on full time, Dr. William Peyton and Dr. Donald Creevy.

The Division of Roentgenology was also established on a full-time basis in 1927, when Dr. Leo G. Rigler returned from foreign study. Dr. Wilhelm Stenstrom came on full time in 1926, in charge of the radium emanation plant and the deep X-ray therapy in the cancer institute. He has been a very valuable addition to the efficiency of cancer therapy and research.

The Head of the Department of Obstetrics and Gynecology has, for many years, been on a three-fourths university time basis. There are two full-time men in this department; Dr. John A. Urner, in charge of the clinic at the Minneapolis General Hospital, and Dr. George E. Hudson, at the University Hospital.

There are no full-time men, except teaching fellows, in ophthalmology, oto-laryngology, dermatology and orthopedics.

The full-time teaching force has grown until it now totals forty-seven, distributed as follows: Anatomy 7, Pathology 3, Physiology 9, Pharmacology 4, Bacteriology 6, Medicine 6, Surgery 3, Obstetrics and Gynecology 2, Pediatrics 3, Public Health 3, Roentgenology 1. If teaching fellows are included the total number in the full-time group is eighty-nine.

*The Nursing School*

Space will not permit adequate discussion of the Nursing School, which has a history of progress quite in keeping with that of the medical school. It was the first "University Nursing School" which now includes the University, Minneapolis General, Charles T. Miller and Northern Pacific hospitals. It has made the same step-by-step advances, under the able direction of Misses Erdman, Powell, Vannier, Mrs. Kurtzman, and now Miss Densford.

*Losses by Retirements, Resignations and Death*

Two notable losses by retirement, on account of age limit, were Dr. Richard Olding Beard and Dr. Thomas G. Lee. Dr. Beard was the last of the original faculty of the medical school. During nearly his whole professional life he served the medical school faithfully. Dr. Lee was the second full-time man on the faculty and the first one to produce research work which attracted wide attention.

Losses by resignation, to accept positions elsewhere, included Dr. Leonard G. Rowntree, pro-

essor of medicine and chief of the department, to go to the Mayo Clinic, in 1921. He was succeeded by Dr. E. T. Bell, under whom the department has continued to progress. Dr. Harold E. Robertson, Professor of Pathology and head of the department, also went to the Mayo Clinic in 1921. Dr. John Sundwall, professor and head of Public Health, in 1921, left to accept the same position at the University of Michigan. He was succeeded by Dr. Harold Diehl, who has developed the work to an extent to attract national attention. Dr. Fred L. Adair, professor of obstetrics and gynecology, in 1929, to take the same position at the University of Chicago, also Dr. Richard E. Scammon, professor of anatomy, in 1930, to become Dean of the Biological Sciences at the University of Chicago. Fortunately, Dr. Scammon returned to us at the beginning of this school year, as Dean of the Medical Sciences. Dr. Frederick W. Schultz, professor and chief of the Department of Pediatrics, also went to Chicago University.

Since the war we have suffered the loss, by death, of four chiefs of services: Dr. Arthur J. Gillette, professor of orthopedic surgery, in 1920-21, Dr. Julius Parker Sedgwick, professor of pediatrics, February 25, 1923, Dr. Louis B. Baldwin, superintendent of the University Hospital, October 24, 1926, Dr. William R. Murray, professor of ophthalmology and oto-laryngology, December 27, 1926, and Dr. Archibald McLaren, professor of surgery, in 1924.

### *Buildings*

Soon after the war, at the request of the President of the University, the Institute of Public Health and Pathology building, the only medical building remaining on the old campus, was vacated and Pathology was crowded into the Institute of Anatomy. This move had the good feature of facilitating correlation between departments and the hospital, and by bringing all departments onto the medical campus, but had the bad result of overcrowding two departments. This condition after another decade, on account of increased registration, has grown worse. There still remains no room for either an anatomical or pathological museum, and these are urgent needs for the proper teaching of anatomy and pathology. So at the beginning of the third decade the medical school was less adequately housed than before the war. However, a building program for the medical school was adopted, in 1919, by the Board of Regents, which contemplated addi-

tions to the Elliot Memorial Hospital and a Nurses' home.

Benefactions by the Citizen's Aid Society for a fifty-bed cancer institute, and by Mrs. Frank C. Todd, together with friends of Dr. Todd, for a pavilion for ophthalmology and oto-laryngology, made another fifty beds available. Both were opened in 1925. The magnificent gift of William Henry Eustis for crippled children, to be administered by the Board of Regents, made possible the use of part of this fund for additional beds for children.

The Board of Regents added a considerable sum to these benefactions for further additions to the University hospitals and built for the Students' Health Service, the Students' Infirmary and hospital as a wing of the University Hospital. These additions were available in 1929.

Thus the plant for clinical teaching and research on the campus now has a capacity of four hundred and fifty beds, about one hundred of which are not available, because there is no appropriation by the legislature for their support.

In addition to the hospital in-patients, the out-patient service in the dispensary now, for the first time, adequately housed in the hospital, furnishes enormous amounts of clinical teaching material. The number of new patients admitted in the dispensary last year was 6,500 or approximately 540 per month, with a total of 70,000 patient visits. The clinical value of this large and rich material is quite equal to that in the hospital, and when the two are taken together, give the student the opportunity to follow cases from the dispensary into the hospital and throughout their further study and treatment. The value of this can hardly be overestimated.

### *Clinical Facilities off the Campus*

For many years the only available clinical material was off the campus in various private hospitals and particularly at the Minneapolis General and Ancker Hospital, in St. Paul. This was unsatisfactory on account of lack of control and restrictions of clinical use. This made the development of a University hospital desirable. The splendid clinical material and teaching at Ancker Hospital were not easily available, on account of distance, and the frequent changes of superintendents at the Minneapolis General, kept us constantly unsettled. However, with the coming of Dr. Walter List as superintendent conditions changed.

While there were restrictions, unavoidable in uncontrolled hospitals, clinical teaching was

greatly improved. Gradually the improvement developed, until the university was permitted to employ full-time chiefs of service. Dr. Charles E. Remy, who succeeded Dr. List, has continued cordial co-operation with the university. In 1927 Dr. George Fahr assumed full-time charge of the university service in medicine at the General Hospital, and in 1929 Dr. John A. Urner became full-time chief of the service in obstetrics and gynecology.

The value of these large services to the university clinical teaching, under the able supervision of Drs. Fahr and Urner, cannot be overvalued, not only on account of the large services, but because of their thorough methods of handling the cases and superior teaching. Other departments with chiefs not on a full-time basis, but giving a large amount of their time, have been given increased opportunities for teaching and care of patients. This is particularly true of surgery, under Dr. Arthur Zierold, and pediatrics under Dr. Edgar J. Huenekens.

The clinical material is not only large, but there is a variety of cases not abundantly found at the University Hospital, notably acute medical conditions, emergency surgery and fractures, and emergency obstetrical and gynecological conditions.

This plan has not been possible at Ancker Hospital, where section clinics are still held, but Dr. Carter, the superintendent, has been very liberal in his attitude toward University teaching. For example, he furnishes sleeping quarters for obstetrical clinical clerks free of charge and furnishes meals at cost, thus permitting the students to see a hundred deliveries a month. The total number of deliveries at the University, Minneapolis General and Ancker Hospitals, last year was more than 2,500, surpassed by few medical schools, due largely to the liberal policies of the superintendents of the two public city hospitals.

Another extra-campus source of valuable clinical material is Glen Lake Sanatorium, the tuberculosis hospital of Hennepin county. The writer has been told by tuberculosis specialists in distant cities that Glen Lake is the best institution of its kind in the country. The full-time men and the associate staff give a great deal of time to teaching university students. For several years, through the courtesy of the Board of Control and the superintendents of the hospitals for the insane, students were assigned to psychiatric clinical work in the various institutions for two weeks.

In the old days we were distressed by the number of students who left Minnesota at the end

of the sophomore and junior years, to go to schools with larger clinical facilities. It is rare now for students to go to other schools.

This recital must impress one with the fact that material for clinical teaching at Minnesota is abundant—and it has been developed chiefly during the last decade—since the war, but this was made possible only by the step-by-step developments of the previous decades. Not only is the material ample, but it is thoroughly used.

The writer believes that the long, lean years taught us how to make the most of the scanty material so that when the increase came, habits of thoroughness, careful study of cases and instructive presentation had been so thoroughly established that the same methods have persisted. Were there not so many other progressive improvements, this might be called "the decade of the development of clinical facilities." But methods have been developed, too.

#### *Improved Teaching Methods*

Simultaneously with the increase in available patients for teaching, have gone efforts at better utilization of the clinical material, notably the student internships, the four-quarter system, clinical clerkships and the required graduate internships and Teaching Fellowships.

#### *Student Internships*

Early in the last decade available clinical material had not grown to its present proportions, so furnishing adequate clinical experience for the students was still a knotty problem. Added to this difficulty came the flood of increased registration, immediately following the war, which embarrassed universities and colleges throughout the country. Our school was no exception.

To meet this situation student internships were established, in 1919, in the teaching hospitals and certain private hospitals. Under this plan seniors spent the last six months as junior interns. This experiment had the advantage, particularly in the charity hospitals, of residency in the hospitals, giving the student constant contact with patients. The idea was sound, but, on account of increased registration, sufficient places could not be furnished. Also because the number of full-time men was not adequate for proper supervision of students at this stage of their education, and because supervision was entirely inadequate, the plan was reluctantly abandoned and the clinical clerkship system adopted.

#### *The Four-quarter System*

For some years work in the medical school had

been offered during the summer, chiefly to advanced students or delinquents and to practitioners. In 1918 the four-quarter system was adopted, the summer quarter being made a full quarter of medical school work. This permitted twelve months' utilization of the entire medical plant. At the end of the sophomore year the class was divided into four divisions, one-fourth of the class beginning their junior year the next summer and going straight through two summer sessions, graduating in three and a half years, or in December of each year. Another quarter of the class saved three months, graduating in March. The remaining half of the class saved no time, taking the usual two quarters off, but not necessarily during the summer as formerly. By re-arranging the work so that there were approximately the same number of students in attendance each of the four quarters and by repeating some courses, the efficiency of the medical plant was increased twenty-five per cent, alleviating in no small degree the difficulties of handling classes which were too large under the three-quarter system. Next year, however, only clinical work will be done during the summer quarter.

#### *Clinical Clerkships*

When it became necessary to abandon the student internship experiment, the clinical clerkship was developed. At first it was found that senior lectures broke into the continuity of the clerkship, so gradually lectures were eliminated from the senior year, chiefly by cutting down the number of so-called "didactic" lectures. Now the senior class is divided into divisions and sections and spends the whole day in hospital work, in the University and Minneapolis General Hospitals, from eight in the morning until five in the afternoon.

Their work is under close supervision by full-time men and fellows. The work begins at eight, with a clinic for all the clerks by the chief of one of the clinical departments. At nine the class divides into sections, going to all departments for history taking, examination of patients, bedside and operating room clinics, laboratory work, dispensary work—in short, every kind of work and activity connected with the care and study of patients. In fact, the whole senior class is busy from morning until night (and during the night in obstetrics) under constant supervision.

Such continuous supervision is possible only by men giving all, or a large amount, of their time. While the need for this type of teacher has become increasingly apparent, there is little feeling

that he should entirely replace the part-time clinicians, whose experience "on the firing line" and their ability make them invaluable. Many of the best teachers in this medical school are men of this type. Their value to the school is illustrated by the reply one of the clinical chiefs made to a query about part-time men in his department. "Why," he said, "I can't get along without them, they're too good."

#### *Care of the Health of Medical Students*

Before the periodic physical examination of medical students by the Students' Health Service, under Dr. Diehl, was established, it was not uncommon for students to break under the strain because of advanced diseases, particularly tuberculosis. Now such conditions are detected earlier. Every student who goes to the Glen Lake Sanatorium is again checked for tuberculosis. It is very rare now for a student to have tuberculosis so far advanced that it cannot be arrested.

#### *Required Graduate Internship*

Shortly before our entrance into the war the medical school adopted the requirement of an internship in an approved hospital as a prerequisite for the Doctor of Medicine degree. This was not put into effect until 1918. The degree of Bachelor of Medicine is conferred at the end of the medical course.

Minnesota was the first medical school to make this requirement and the only school to secure the internship for its students. Better and better internships become available every year, chiefly because of the records made as interns by Minnesota graduates in competition with men from the best schools in the country; for example, one of our seniors, who ranked twenty-sixth in his class, took the examinations for internships in one of the best and largest hospitals in the country. In this examination he ranked eighth among one hundred and eight. After all is said and done, the proof of our teaching does not depend upon this story of our improvements and developments, not even upon what the students think about it. They usually appreciate their school more after they have served an internship away from home; as one of them said: "I had to go to New York to appreciate the kind of school from which I graduated." The real proof depends on our product out in the world, in competition with the best.

Here are a few estimates of the product, from superintendents of hospitals from various parts of the country: From New York City: "I wish we could have more such men from the West." This man ranked fortieth in a class of fifty-one

at Minnesota. From a middle western University hospital: "Dr. G. ranked 98.9 per cent." He ranked fifty-second at Minnesota. "I want to congratulate the University of Minnesota upon the type of men it turns out." From Detroit, Michigan: "This boy has been an exceptionally good intern. We grade him "A" in everything. This "exceptional boy" ranked seventy-fifth in his class of seventy-seven. "Dr. W. ranked fifth in the New Jersey State Board examinations." He ranked next to the last man in his class at Minnesota. From the United States Army: "Dr. S. is leading our interns." Col. R., Commanding Officer. From the United States Navy: "If you have any more youngsters like these, we would like to have them in the service." "Minnesota men, without exception, are away above the average." Capt. R., U. S. Navy. "He reflects credit upon his medical school," yet he ranked seventy-second in a class of seventy-four. The girls, too: "This is our first experience with a female intern, but her service has been so highly satisfactory that it will be difficult to have male interns accepted hereafter." Verily, "the proof of the pudding is in the eating."

#### *Graduate Work—Teaching Fellows*

During the last decade, concurrently with the development of undergraduate teaching, graduate teaching gradually evolved, chiefly under the Teaching Fellowship plan. Fellowships are for three years, with progressive stipends of \$800.00, \$900.00 and \$1,000.00. Fellows are registered in the Graduate School of the University, are candidates for the Doctor of Philosophy degree and must fulfill the same requirements as candidates for the same degree in any department of the university. In addition to the major subject they have chosen, they must elect a minor in another department, usually one of the basic sciences, and must write and defend a thesis on research work which is a distinct new contribution to science.

There are now forty-three teaching fellows in anatomy, pathology, physiology, bacteriology, medicine, surgery, pediatrics, obstetrics and gynecology, dermatology, ophthalmology and otolaryngology, orthopedics, public health and roentgenology.

The great development of the medical school, during the two decades of his service, is a monument to the vision of Dean Lyon.

To the writer all this progress seems the more remarkable because he has been a witness of it all. As a student and teacher he has seen the plant grow from one small building off the campus, to a fine group of buildings on a medical campus of several acres.

The faculty has developed from a group of general practitioners to a force of specialists: fifty (ninety, including fellows) of them on full time. Attendance requirements to earn the Doctor of Medicine degree have increased from eighteen to sixty-six months.

Controlled clinical facilities have grown from nothing to a hospital of four hundred and fifty beds, and a dispensary with 70,000 visits and extra-campus patients, from a few hundred to several thousand.

#### *Practitioner's Extension Courses*

In addition to the advanced graduate courses at the university, practitioners' courses are given in various parts of the state, under the direction of the Extension Division of the University, in co-operation with a joint committee from the University and the State Medical Society, headed by Dr. N. O. Pearce.

#### *Comprehensive Examinations*

In 1930 all final course examinations were abolished and a "comprehensive examination" given at the end of each year in all subjects. Under the direction of Dr. E. T. Rasmussen, this plan is proving a distinct pedagogical advantage.

#### *Alumni Co-operation*

Under a committee headed by Dr. S. B. Solhaug, lectures, usually by alumni, are given on subjects not included in the regular curriculum, such as medical economics, ethics, etc. Attendance is voluntary and they have proved very valuable and are appreciated by both students and faculty.

The advisory committee of the medical alumni has also offered valuable constructive criticisms which are always welcome because they emanate from alumni loyalty.

With regents, faculty and alumni continuing to show the same spirit of devotion they have in the past, with the same effort for constant progress, "for improving last year's model," What Is Impossible in the Future?



## Education and the Medical Journal

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"EDUCATION IN THE SCIENCES"

*Carved by Paul Fjelde*

*"There are many problems and difficulties in the education of a medical student, but they are not more difficult than the question of the continuous education of the general practitioner. Over the one we have some control, over the other none."—Osler.*

AS OSLER so clearly saw, the most important part of medical education is that of the general practitioner, since medicine is not a static, but a living and growing science which advances continuously. The problem then evolves into one of acquainting the general practitioner and specialist alike with the results of this growth through the findings of numberless research workers and clinicians. By far the most satisfactory means of disbursing this knowledge is through the medium of medical journals.

One of the great educational functions of the medical journal has been the publishing of new material. Much of the original work of the world's great contributors to medicine has first appeared in the pages of medical journals. It is often said that it requires approximately ten years for new facts to get into textbooks. This is often true. A fact that is discovered soon after a textbook is printed will not be included until that book is revised, which may be ten years hence or more, depending upon the size of the edition, the demand for the book, etc. But the medical journal, with its frequent issues, is in a position to broadcast to the world new information with subsequent comment, discussion, confirmation, or refutation. The recent work of Banting on diabetes and that of Murphy and Minot on pernicious anemia was quickly broadcast to the profession

through the columns of medical journals. There are excellent books dealing with these diseases which today do not include the recent discoveries because they have not since been revised. There is no medium, therefore, by which the medical profession can keep up its education so well as the medical journal.

The medical journal may afford another great service by publishing post-graduate courses. The idea of post-graduate instruction is not new. Schools of medicine have long employed it, but this necessitated that the physicians give up their practice and most of their local work and leave home to attend such a course. This course might last a few days or it might extend over months. Such courses have their place, and some physicians can take advantage of them; however, the number is limited. In an attempt to reach a larger number, the faculties of medical schools and state medical associations organized post-graduate courses which were taken to county or district medical societies. In other words, the faculty goes to the doctors, rather than the doctors to the faculty. This also has its limitations. There are districts in the country where the number of physicians is too few to justify having such courses. Moreover, because of their heavy practices, some of the physicians are not able to be present for the entire course.

The medical journal is in a position to publish lectures of such a course so those who cannot take advantage of the course itself are able to read the published lectures at their convenience. This is a splendid service and one which should be offered by more medical journals. Courses of lectures in pediatrics, X-ray, pathology, et cetera, are frequently published. Clinics on such subjects have been very popular among physicians.

Another important function of the medical journal is that of compilation, analysis, and summarization of the important literature of the world on one subject, bringing the subject up to date. There is so much being published in special fields that it is a physical impossibility for the physician in general practice to read all of the literature in each phase of his practice. Indeed, in certain special fields there is so much being published in the medical journals of the world that it is impossible for those limiting their practice to any one of these fields to read all that is published. If they even attempted it, they would have no time for practice and still would fall short of reading all. A single phase of the work, however, may be summarized and published in medical journals so that each physician who reads it may learn of all of the essentials in that particular phase. By dealing with different phases in this manner, the physician can keep fairly well abreast of the times.

Some medical journals are doing much for their readers by publishing special numbers. For example, one entire number may be devoted to gynecology, another to fractures. When such subjects are brought up to date, the special numbers are not only of great value at the time they appear, but are very much worth while for future reference. If these special numbers appear frequently, they have great value in medical education.

Because the medical literature of the world has become so voluminous, the medical journal can aid tremendously by publishing brief abstracts which bring out the essential points in current articles. The reading of such abstracts is within the realm of physical possibility of many physicians.

The editorial columns of a medical journal may be used to great advantage in the frank expressions of opinion regarding any phase of medical practice, medical education, et cetera. Here the function of the editorial is the same as in any periodical, but it has special reference to medical interests. Evaluation, summation, and some prognosticating give a deeper meaning to the train of



WISDOM

*Illustration from "As We Are" by  
Victor Kubiny*

discoveries and practices than is apparent at the casual reading of the facts. Many journals, too, conduct a column for correspondence from their readers. This gives an opportunity for the discussion of any phase of medicine that is of interest, in an open forum, though the two or more participants be hundreds of miles apart.

There is a growing interest in the medical profession in subjects apart from the art of medical practice which may be discussed to great advantage in medical journals. I have in mind such subjects as medical economics and legislation. An article in January or February of each year on the income tax, with particular reference to legal exemptions, is very much worth while. Not every physician employs a public accountant to prepare his income tax report. Most physicians do not remember from year to year just what is legally exempt. Moreover, the changes are made rather frequently; therefore, the medical journal, by publishing such an article at the time income tax reports are being prepared, not only keeps the physician abreast of the times but also lightens his work.

In the early days the news items concerning physicians and their activities were of great importance. A class of students would graduate; they would then scatter and locate in different parts of a state or district or a nation. They would be too busy to carry on extensive personal correspondence, but at the same time their interest in the welfare of one another did not wane. The medical journal was the place where they could read of the whereabouts and the activities of their former schoolmates and acquaintances. This

function of the medical journal has continued in popularity to the present time and must be looked upon as educational.

That the medical journal has a definite place in the education of the profession is evidenced in many ways, one of which is actually seeing on the desks in large numbers of physicians' offices the current numbers of one or more medical journals and in the book cases the volumes of these journals over periods of years, often bound for preservation. When one enters into conversation with these physicians, one is impressed with the frequent references to what they have recently read in their medical journals. The medical journal is a distinct asset in that its subscription price rarely exceeds the list price of one medical book. When this fact is considered in conjunction with the recency of its date, many physicians invest in the journals.

The large number of medical journals has been noted. Not only is it a physical impossibility to read all these journals, but the yearly cost of the entire list is prohibitive. Organization has helped in this situation. Medical societies are able to provide a variety of these periodicals for the use of their members. A medical library, which has these different periodicals, both American and foreign, offers every member access to this information whenever it is desired. Ready reference to the exact article in most medical journals is made available through the priceless library tools, such as the Index Medicus and the Cumulation Index. This means for the busy physician his material is at hand though his definite knowledge may be only the author's name or only the subject matter. Therefore, a review of the literature either for his own knowledge or for a scientific paper of great or small import is simplified, for he need only send his request to the library of his medical society.

The medical profession has developed numerous corollaries such as nursing, dietics, hospital management, social service, and the like. The

members of these professions have need for the recent facts. While they each have their own journals, still many of them have need of medical information from time to time which is more satisfactory if of limited proportions, such as an article in a medical journal.

If a medical journal is to do the greatest good in medical education, it must be timely. Therefore, the frequency of its appearance is important. If the journal is highly scientific and is read by a limited group, monthly or quarterly publications may suffice, but if a considerable percentage of the readers are in general practice, the oftener the issues appear the better. One of the many very fine points about the Journal of the American Medical Association is that it appears weekly: in other words, it keeps the profession up to date. Many state and district medical journals are published monthly. If funds were available, I believe they would do a much greater service with more frequent publications. The combined issues for the month, whether they be four or less, would not need to contain any more pages than the present monthly issues. In this way, the items in the news columns would not be stale by the time of publication. Important events may occur just after a journal goes to press, and by the time the next issue is published the news has gotten around to the profession through other channels. On more than one occasion, I have known physicians deserving of priority in the presentation of new material, who secured it because of frequent publications of journals. If they had been compelled to wait for a quarterly, or even a monthly journal, priority would have been had by those undeserving of it.

The journal's place in medical education is unique. Its greatest asset is its up-to-the-minute and timeliness features, which, when reinforced by its lower cost, accessibility and possibilities for permanence make it the most important means of disseminating medical education so that "he who runs may read."



# Graduate Medical Education at the University of Minnesota

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IT IS now generally recognized that in medicine, as in other fields, education is a process continuing beyond graduation. By the accumulation of experience in active practice, by discussion and association with colleagues in medical societies, and by study of the medical literature, the practitioner progresses in skill and judgment. In keeping the practitioner in touch with the advances in medical science, valuable aid is rendered also through the Medical School, by offering renewed opportunities for visits to the laboratories and clinics, and by means of practical extramural courses and extension work of various kinds. All of these educational devices are necessary and excellent, but alone they are not sufficient, at least for those who are ambitious and capable of more highly specialized work in the various branches of medicine. For the service and welfare of the public, and for the advancement of medical science, we must have, not only well-qualified general practitioners, but also more extensively trained specialists.

The training and certification of competent medical specialists constitute a medical and social problem of great importance. The purpose of the undergraduate medical curriculum is properly restricted primarily to the preparation of general practitioners. Beyond this, further training and experience are required for specialism. But the necessary amount and character of this training are still undetermined. In the absence of any legal restrictions or requirements, specialists of

the most varied qualifications present themselves to the public by the convenient method of self-proclamation. Under these circumstances, the public is confused and helpless; and the medical profession has not been able to do much to remedy the situation. In an attempt to help in the solution of this problem, the University of Minnesota has for many years given serious attention to the development of graduate medical education.

In providing for graduate instruction and training in medicine, as in other fields, three things are essential: a strong faculty, adequate facilities for advanced work and properly qualified students.

TABLE 1  
Graduate Faculty in the Medical Departments, 1930-31

	Pro- fessors	Associate Pro- fessors	Assistant Pro- fessors	Instruc- tors	Total
Minneapolis . . . . .	28	25	31	4	88
Rochester . . . . .	22	25	36	63	146
Total . . . . .	50	50	67	67	234

The medical graduate faculty at Minnesota now includes 234 members, as shown in table 1, classified according to rank at Minneapolis as well as at Rochester (on the Mayo Foundation). This faculty constitutes a carefully selected group, chosen for their superior professional skill, coupled with ability in medical research as evidenced by their publications. They represent all of the principal divisions of medicine, in both clinical and laboratory sciences. Many of them have national and even international reputations.

It is generally admitted that, as a whole, they form a group of unexcelled talent for the task of graduate medical instruction. During the past sixteen years, this faculty has quadrupled in number, increasing from fifty-eight (thirty-one at Minneapolis and twenty-seven at Rochester) in 1914-15, to 234 at the present time. A graduate faculty must be relatively large, because the work of teaching is largely individual in character.

The medical graduate faculty is organized under the Graduate School, which facilitates co-operation between the Medical School and the various other colleges of the University in higher medical education and research. The work is supervised by the Medical Graduate Committee, with the following membership: *ex-officio*, the President of the University, the Dean of the Graduate School, the Dean of the Medical School and the Director of the Mayo Foundation; four additional members appointed from Minneapolis, and four from Rochester (Mayo Foundation).

In facilities for study and training, the hospitals, clinics, libraries and laboratories available through the Medical School, the Mayo Foundation and other affiliated institutions, likewise afford unusual opportunities. The University Hospital provides a clinic of four hundred beds, with the accumulated records of sixteen years. The hospital includes the Memorial Cancer Institute, the Todd Memorial Hospital (Eye, Ear, Nose and Throat), the William Eustis Hospital for Crippled Children, and the Students' Health Service. The Hospital also houses the Out-Patient Department, with over 13,000 patients and 50,000 patients' visits annually. The Minneapolis General Hospital and the Ancker Hospital of St. Paul together represent about 1,400 beds in every phase of clinical work. This material, and also that of the Miller Hospital, St. Paul, is available for graduate study.

Clinical facilities are also offered at the State Hospital for Crippled and Deformed (Phalen Park, St. Paul), at the Hennepin County Tuberculosis Sanatorium (Glen Lake) and at the Pokegama Sanatorium. The University medical laboratories are well equipped for study and research in all the medical sciences, and the University Library includes one of the best medical libraries in the country. The library collections in the Hennepin County and the Ramsey County Medical Societies are also useful for reference.

At Rochester, the facilities available through the Mayo Foundation have a world-wide reputation. The St. Mary's, Colonial, Worrell, Curie and Kahler hospitals include an aggregate of

about 1,500 beds, with twelve operating rooms for general surgery and numerous others for special purposes. There are nearly 80,000 patients and 30,000 operations annually. The accumulated records form a rich storehouse of material available for study according to the most modern methods of medical statistics.

All patients are examined in the Mayo Clinic Building, a new nineteen-story structure especially designed and equipped for the purpose. An excellent medical library is housed in this building. The department of chemistry occupies the entire fourth floor, the museum and photographic studio the fifth floor, and the laboratories of pathology the sixth floor. The museum contains over 250,000 pathologic specimens. All specimens and their case histories are classified and arranged for use in scientific research. It is noteworthy that consent for post-mortems is obtained from about 85 per cent of patients who die in the clinic.

The third and most important desideratum for graduate medical education is a group of well-qualified students, without which the faculty and facilities are useless. The M.D. degree from a class-A medical college, plus an acceptable internship, represent merely minimal requirements. It should be strongly emphasized that more than average scholastic ability is necessary to meet the high standards for graduate work in scientific medicine. Without this native talent, no amount of zeal and energy will suffice. The graduate school is no place for the mere plodder, for it requires a high degree of intelligence as well as thorough preliminary training.

TABLE 2  
Graduate Registration According to Major Subjects During the Year 1930-31

Departments	Minneapolis	Rochester	Total
Anatomy .....	12	1	13
Anesthesia .....	1	1	1
Bacteriology .....	14	3	17
Biophysics .....	6	6	6
Dermatology .....	8	8	8
Medicine .....	7	75	82
Neurology and Neurosurgery ..	1	7	8
Obstetrics and Gynecology .....	5	5	10
Ophthalmology .....	3	3	3
Oto-Laryngology .....	4	13	17
Orthopedic Surgery .....	6	6	6
Pathology .....	20	14	34
Pediatrics .....	1	10	11
Pharmacology .....	1	..	1
Physiology and Physiologic Chemistry .....	14	7	21
Preventive Medicine .....	5	..	5
Proctology .....	2	2	2
Radiology .....	10	9	19
Surgery .....	9	96	105
Urology .....	..	9	9
Miscellaneous .....	..	2	2
Total .....	103	277	380

The number of students accepted is limited to those whom the facilities will accommodate. With

the growth in these facilities, the number has steadily increased in the past sixteen years, since the medical graduate work was formally established, from fifty-seven (twenty-one at Minneapolis and thirty-six at Rochester) in the year 1914-15, to 380 during the past year of 1930-31. The distribution of these students according to their major departments of study last year is shown in table 2. As indicated in this table, 103 students were registered at Minneapolis, chiefly in the medical laboratory sciences; while the 277 students at Rochester (on the Mayo Foundation) were mainly concerned with the various clinical branches of study. Some students find it profitable to divide their time between Minneapolis and Rochester.

About half the students at Minneapolis, and nearly all of those at Rochester are on fellowships paying (in the clinical fields) \$800 the first year, \$900 the second year, and \$1,000 the third year of service. The fellowships at Minneapolis are supported chiefly by general university funds, but partly by the affiliated hospitals. The fellowships at Rochester are provided partly from the income of the Mayo Foundation (an endowment of two million dollars, yielding about \$100,000 a year), and partly from outside sources. For the support of medical research at Minneapolis, there is also a special legislative appropriation of \$25,000 a year.

The methods of study followed by these graduate students are noteworthy, in contrast with

those of the undergraduate on the one hand, and those of the usual medical "postgraduate," or short-course polyclinic institutions on the other. In the university graduate work there are few lectures or classes of the ordinary kind, and no fixed curriculum. Each student, with the assistance of his adviser and the approval of the dean and medical group committee, maps out a program best fitted to his individual needs. The work is largely practical in character, both laboratory and clinical. It is recognized that clinical specialism requires a more thorough foundation than can possibly be obtained in the undergraduate medical curriculum, so the clinical students must include the necessary work in the fundamental laboratories.

The graduate student works largely under the direct personal supervision of his adviser, thus conserving the advantages of the ancient preceptor or apprentice system. Opportunities and facilities are offered, but there is no "spoon-feeding," and each student, with a minimum of expert guidance, must work largely on his own initiative. He must learn to think and act independently in the solution of medical problems. This constructive aspect of the work culminates in the thesis, in connection with which he is trained for scientific research in his special field.

The extent of the thesis research varies according to the degree sought. For the master's degree a shorter dissertation is required, demonstrating familiarity with the literature of the subject and



"A CONSULTATION OF PHYSICIANS"

*Frontispiece in Ancient French Medical Volume (1519)*

capacity for research based on original observations. For the doctor's degree (Ph.D.) a much more extensive study is necessary, establishing original results which form a substantial contribution to knowledge. In reality the thesis stands as a symbol of the research spirit that should permeate all graduate work. Unless the student comes to consider his clinical cases in general as a series of problems challenging him for scientific solution, his education has been in vain. For upon the physicians imbued with this spirit, the future progress in medicine is largely dependent.

Since the clinical specialist should be prepared for actual practice, he must have not only scientific ability, but also professional skill in the application of his scientific knowledge to the treatment of his patients. An expert pathologist is not necessarily a good surgeon. Clinical skill can be gained only by prolonged experience at the bedside. It is largely on this account that the usual minimal period of three years is often found too short to train a real specialist. Since the public usually does not discriminate in the significance of degrees, it has been the policy at Minnesota to require every candidate for either the master's or doctor's (Ph.D.) degree in clinical subjects to obtain from his medical teachers a certificate of his clinical proficiency. And the informal definition of clinical proficiency is the ability which these teachers would expect in case of diagnosis or treatment required for members of their own families. If this degree of technical skill and scientific ability has been attained and demonstrated by searching tests and examinations, the University may safely bestow upon the candidate the degree which certifies him to the world as a competent specialist in the designated field of medicine.

During the past sixteen years the University of Minnesota has conferred a grand total of 429 graduate degrees in the medical group, including both clinical and laboratory subjects. At Minneapolis there were 177, including 123 masters and fifty-four doctors (Ph.D.); while on the Mayo Foundation there were 252, including 238 masters and fourteen doctors (Ph.D.). The distribution of the forty-two degrees conferred during the past year (1930-31) according to departments, is shown in table 3. The comparison is not fair in some respects, since the number in each department varies considerably from year to year. It is evident, however, that the greater number of masters come from Rochester, with surgery and medicine predominating; while the doctors (Ph.D.) are chiefly from Minneapolis.

TABLE 3  
Graduate Degrees Conferred in the Medical Subjects During the Year 1930-31

Department	Minneapolis		Rochester (Mayo Foundation)		Total
	Master's	Ph.D.	Master's	Ph.D.	
Anatomy .....	1	1	..	..	2
Bacteriology .....	1	1	..	..	2
Dermatology .....	..	..	2	..	2
Medicine .....	1	..	6	..	7
Neurology .....	..	1	..	..	1
Obstetrics and Gynecology .....	..	1	..	..	1
Orthopedic Surgery .....	..	..	1	..	1
Oto-Laryngology .....	..	..	2	..	2
Pathology .....	3	..	..	..	3
Physiology and Physiologic Chemistry .....	2	1	..	..	3
Preventive Medicine .....	1	..	..	..	1
Radiology .....	1	..	..	..	1
Surgery .....	3	..	10	..	13
Urology .....	..	..	3	..	3
Total .....	13	5	24	0	42

What has become of all these 429 graduates in the various subjects? Of those taking higher degrees in the laboratory sciences, some have gone into clinical work, but many have continued their careers in laboratory teaching and research at Minnesota and other universities. The clinical graduates have, to a large extent, engaged in the specialized practice for which they were primarily trained. As might be expected, many have also received appointments as clinical teachers and investigators in various universities. Several important headships in both laboratory and clinical departments have recently been filled by men with higher degrees from Minnesota.

The success very generally attained by all of these graduates, in practice, in teaching and in research, is most gratifying. It bears eloquent testimony that the University of Minnesota has been on the right track in setting higher standards for medical graduate work. The plan has been received with much interest and favorable comment when presented at various times by Deans Ford and Lyon, and also by Dr. Wilson (Director of the Mayo Foundation), before national organizations such as the Association of American Universities and the Association of American Medical Colleges. It has likewise been approved by the Council on Medical Education of the American Medical Association, and has been followed more or less closely by various other graduate institutions. It would therefore appear reasonable to conclude that the experimental stage has been safely passed, and that the University of Minnesota may be credited with successful leadership in graduate medical work as well as in other phases of medical education.

## The South Dakota State Health Laboratory

J. C. OHLMACHER, M.D., *Director*  
*Vermilion, S. D.*



*Illustration, Cover Design for "Struggle for Health" by  
 Richard Hoffman, M.D.*

**B**Y AN act of the 1909 South Dakota Legislature, the State Board of Health Laboratory, designated the State Health Laboratory, was created. By this act the laboratory was made a part of the bacteriological laboratory of the School of Medicine of the University at Vermillion, and the professor of Bacteriology and Pathology of the School of Medicine became Director.

The State Health Laboratory was created in the minds of C. P. Lommen, then Dean of the School of Medicine and Dr. F. A. Spafford, then a member of the State Board of Regents. Both these men have since died.

The first Director of the State Health Laboratory was Dr. Mortimer Herzberg. Dr. Herzberg, ably assisted by the advice and moral support of Dean Lommen and Dr. Spafford, soon put the laboratory on a firm basis. The laboratory grew in size and usefulness and soon became widely recognized as a most useful and necessary part of the State Board of Health's activities. Though from the first some of the state's most prominent physicians supported and encouraged the further growth of the laboratory, it was not until the end

of the World war that general use was made of its diagnostic facilities. It is assumed that many physicians did not fully appreciate the value of laboratory diagnostic procedures in the proper handling of contagious and other diseases prior to the war, but that their army experience forcibly brought to their attention the great value of the laboratory to modern day practice. At any rate the amount of diagnostic work done in the laboratory was not commensurate with the size, population, nor the number of physicians in South Dakota, until after the World war when it rapidly increased. Today the laboratory is making about eight times as many tests as were made prior to 1918. In this connection, it is significant that the size of the laboratory staff remains the same.

In the spring of 1918, Dr. Herzberg resigned, accepting an apparently more attractive position elsewhere. This resignation was a distinct loss to the university, the School of Medicine and to the State Board of Health. In the fall of 1918 the Board of Regents appointed Dr. J. C. Ohlmacher to succeed Dr. Herzberg.

As indicated previously, the work of the labora-

tory rapidly increased since 1918, until now it bids fair to overtax the present facilities and personnel of the laboratory.

From the first the usual diagnostic procedures, particularly appertaining to the control of contagious diseases, was carried on free of charge, with the exception of those pertaining to the venereal diseases, gonorrhoea and syphilis. In 1918 the State Board of Health made syphilis and gonorrhoea reportable and quarantinable diseases, and placed the tests for them on the free list. The Wassermann test for syphilis, originally adopted by Dr. Herzberg, was later modified by the new Director to more nearly fit the needs of advancing laboratory medicine. Early in 1926 the Kahn flocculation, or precipitation test, was added as a check or control for the Wassermann test. It was at first hoped that the Kahn test or some form of precipitation test would prove of such value as to fully supplant the more exacting and expensive Wassermann test, but our results indicated it less reliable than the Wassermann test, so both were adopted as routine procedures, and remain so to the present time. The one test is used as a check on the other.

In addition to the usual free tests, the laboratory, from the first, undertook to apply well-known and recognized diagnostic methods as an aid to physicians in the study of their private patients. These tests include various forms of blood analyses, urine analysis, analysis of stomach contents, special bacteriological procedures including animal inoculations, tissue diagnosis, and so forth. For this type of work a nominal fee is charged, the money accruing therefrom going towards the support of the laboratory.

A greatly increased number of tissue specimens are now being sent in for diagnosis. Practically every hospital and surgeon in the state thus utilizes the laboratory facilities. In addition to the income from this source, an abundant supply of tissue is afforded the class in pathology.

Definite constructive research, emanating from the laboratory has not been attempted until recently, because of lack of funds and an all too limited laboratory staff. However, in co-operation with the Board of Health at Waubay, a systematic bacteriological study of the public drinking waters of the state was completed two years ago. At the present time the laboratory is making an investigation into the prevalence, distribution and manner of spread of undulant fever in South

Dakota. A fund provided by the city of Vermillion, in consideration for the routine analysis of milk distributed within the city's limits, has made it possible to establish a graduate student assistantship. The first appointment under this fund is a graduate student in bacteriology from the University of Illinois. Some valuable and interesting results have been obtained which will probably form the basis for a more rational and vigorous campaign against undulant fever in this state.

The population and resources of the state do not permit the laboratory to develop biologicals for free distribution to physicians, as they do in a few other states. Our efforts in this direction are confined to the preparation of triple typhoid vaccine for free distribution to the physicians of this state.

There have been changes in the personnel of the laboratory staff from time to time, but the number constituting the staff has remained the same almost from the beginning. The staff is composed of a Director who is also professor of Bacteriology and Pathology in the School of Medicine; an Assistant Director who is also professor of Bacteriology in the School of Arts and Sciences; a technician, a clerk and general assistant.

Two laboratories, the municipal Public Health Laboratory at Sioux Falls and the laboratory of the Public Health Department at Aberdeen, are authorized by the State Board of Health to conduct such routine examinations as pertain to the diagnosis of such diseases as tuberculosis, typhoid fever, diphtheria and gonorrhoea. These laboratories are called "Accredited Laboratories" and are under the jurisdiction of the State Health Laboratory at Vermillion.

Early in its development the laboratory was allotted fine quarters in the Chemistry Building, one of the buildings belonging to the university. These quarters have been used for this purpose up to the present time. The university furnished the rooms, heat, light and janitor service and pays half of the Director's salary. The appointments to the laboratory staff and the amount of the salary of the staff members rests in the hands of the State Board of Regents. This removes the laboratory from under the fickle influence of politics, at the same time affecting a great saving to the state.

## The North Dakota State Public Health Laboratories

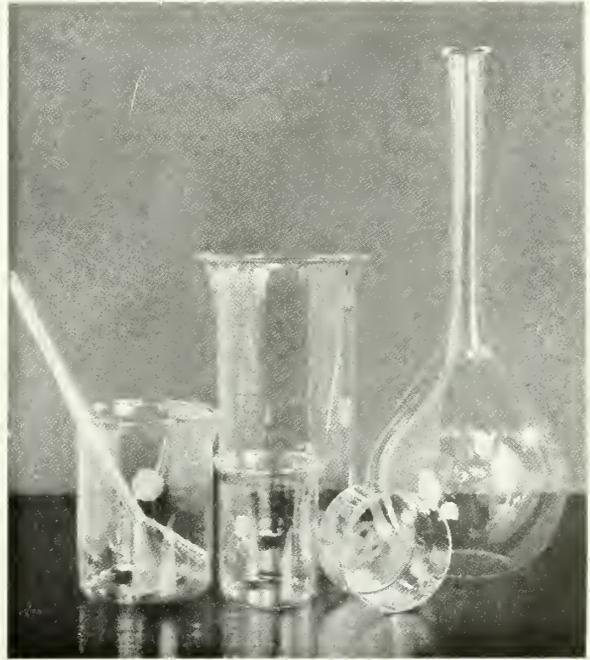
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THE North Dakota State Public Health Laboratory opened its doors for work on July 1, 1907. This was a little less than thirteen years after the creation of the first state laboratory of the kind in Rhode Island in 1894. It was a few years before the development of the Wassermann test, and many other laboratory procedures have been developed or improved since that time. But bacteriology had become established as a science, and the relation of infection to disease was pretty well understood. Laboratory procedures had already become an essential factor in the diagnosis of many conditions, and were used in all hospitals and by many practitioners. State and municipal hygienic laboratories were developing rapidly, and it was beginning to be realized that such a laboratory must be an important element in the efforts the state should put forth to prevent and control a large group of diseases. In fact the establishment of the State Health Laboratory was the very first really important step of this kind to be made by North Dakota, since provision for a full-time health officer and even modest provisions for vital statistics, sanitary engineering, etc., were neglected until a much later date.

Mention should be made of the late Dr. J. D. Taylor who was influential in securing the necessary legislation, and of Dr. G. F. Ruediger, who will be remembered as its organizer and its director for many years. Dr. Ruediger's capacity for work, his thoroughness, and his reliable judgment impressed the physicians of the state at once, and still continue to be a challenge to all that have anything to do with the service.

After two or three years branch laboratories were established in Bismarck and Minot; still later a branch was organized in Fargo by taking over a local laboratory started some time earlier by the city, county and local medical society. The service receives some help from the cities in which the branches are located in return for certain examinations of the local water and milk supplies. The branches are maintained in an effort to make the services the laboratories can furnish as readily accessible to every part of the state as is reasonably possible. The ordinary tests are



CHEMISTRY

*Photograph by Hiromu Kira from "American Annual of Photography"*

made in all of the laboratory branches, particularly the simpler processes and those for emergency conditions. The Wassermann test is done only in the Main Laboratory and the Bismarck branch. Examinations of tissues for pathology, which is one of the procedures listed in the law creating the Laboratory, and a few other tests, such as for rabies, and the chemical examinations of water, are done only in the Main Laboratory.

In the first year of its existence the new laboratory, despite the problems attendant to organization, performed 1,828 examinations. The second year it did 3,293. The continued growth of the service in popularity and importance can be indicated by the figures showing the number of examinations done in each of several years:

Year	No. of Examinations
1910-11	5,243
1913-14	9,443
1916-17	14,442
1922-23	15,357
1927-28	16,468

For the three years, July 1, 1928, to July 1, 1931, the average was 23,279 per year.

For the first five months of the year 1931-32 the total is 10,235.

For the first eleven months of the calendar year, 1931, the average number of examinations per month in each branch is as follows: Main Laboratory 843; Bismarck Branch 638; Fargo Branch 319; Minot Branch 271. The larger numbers in the first two mentioned laboratories are readily understood.

As showing something of the variety of tests called for and their relative frequency, the total numbers for a few of the more common examinations during the recent typical quarter are given below:

Cultures for Diphtheria .....	475
Sputum for Tuberculosis .....	260
Blood for Typhoid (Widal).....	103
Blood for Syphilis (Wassermann).....	1,514
Pus for Gonorrhoea .....	805
Spinal Fluid for Meningitis.....	40
Smears for Vincent's Angina.....	294
Tissues for Pathology .....	287
Water, bacteriologically .....	617
Milk, bacteriologically .....	489

The list might be several times as long, with other tests giving frequencies from one to several hundreds each. Some of the tests are quite constant from month to month, such as tissues and the Wassermann tests. Others like those for diphtheria, typhoid and meningitis vary greatly, as might be supposed.

The services of the Laboratory seem to be used by most of the practitioners of the state, particularly by those who come in contact with the diseases which affect public health. A great deal of clinical laboratory work not involving public

health is, of course, now done in the laboratories of hospitals and clinics. In this day it is needless to discuss the help that a hygienic laboratory can offer, or its importance in a health program.

The establishment and the continuation of the laboratory in connection with the School of Medicine constitute an example of wise action on the part of the state. At the beginning this was very obvious; in fact many, if not most, of the early hygienic laboratories were in connection with some college, university, or medical school. Moreover, at that time North Dakota was one of the states that had not yet made much provision for a state health department.

With the growth and importance, on the one hand, of the schools, and on the other of whole state health programs involving both laboratories and health departments, there has been a tendency in some of the larger states for health departments to take over the laboratories into their own organizations. Several states, however, have not done this but have left the budgets and the immediate direction of the laboratories with the schools, and certainly in a state having the wealth and the population of North Dakota, the latter is the better plan. There are some advantages to the school in the way of contact with physicians, and in the receipt of material of use for teaching purposes; the service itself is an object lesson. The advantages to the profession and to the state are still greater in economy and efficiency, in the co-operation of various other scientific departments,

and in contact with the scientific research of the university. Just as inspections and police powers should be concentrated in certain departments, scientific tests might well be provided for at the places in which the state has established its facilities for instruction and scientific investigation.



"ASPIRATION"

Illustration from "As We Are" by  
Victor Kubiny

# The University of Minnesota Hospitals as Educational Centers

PAUL H. FESLER

*Superintendent, University of Minnesota Hospitals  
Minneapolis, Minn.*



UNIVERSITY OF MINNESOTA HOSPITALS

**A**DEQUATE hospital beds under the full control of the medical school are essential in the organization of approved medical schools.

For years the Minneapolis General Hospital and the Ancker Hospital, St. Paul, were the principle teaching hospitals of the University of Minnesota, but in 1911, through the generosity of the family of Dr. Elliott, the Elliott Memorial Hospital was erected. This was a general hospital of two hundred beds. From 1911 to 1921, it was operated as a part of the University of Minnesota, but in 1921 a law was passed establishing the Minnesota General Hospital. This law provides that "hospitals now and hereafter established in connection with the Medical School of the University of Minnesota shall be known as the "Minnesota General Hospital." This law also provides that all hospitals erected by the University in the future should become a part of this General Hospital; and further provides that any legal resident of any county of the state "afflicted with a malady, deformity, or ailment of a nature which can probably be remedied by hospital service and treatment, and is unable financially to pay for same, is entitled to admission to the Minnesota General Hospital."

The patients may be reported by the sheriff, town clerk, health officer, public health nurse, policeman, or any other public official or citizen. It is his duty to fill out certain blanks and have the patient committed to the hospital by the county commissioners. The commissioners must make the proper investigations as to the financial standing of patients. They are required to arrange, also, for a physician to make an examination and file a report in writing, setting forth the

history of such case and other necessary information. These blanks are submitted to the superintendent, and if the patient seems to be of teaching value and there is a possibility of remedy, the patient is admitted to the hospital. The county commissioners or the superintendent of the hospital have authority to reject the patient. As other hospital facilities are available in the state, and the University Hospital is primarily a teaching institution, patients are selected because of their teaching value, but in certain instances where facilities are not available in other sections of the state, patients are received for the purpose of treatment.

Since the establishment of the Elliott Hospital, a service building has been added by the university. The relatives of Dr. Frank C. Todd and some other generous citizens donated funds for the erection of the Todd Hospital for the care of eye, ear, nose, and throat diseases. At the same time, the Citizen's Aid Society of Minneapolis established the Cancer Institute. These buildings were erected at an expense of approximately \$500,000. In 1928, another unit was added to the hospital, which included the Eustis Hospital for children, Student's Health Service, wards for women and obstetrical patients, and Out-Patient Department, the funds coming from the Eustis fund, Health Service, and the state, this at a cost of \$800,000. This provided an additional two hundred beds, so the University Hospital now contains four hundred beds with an average of three hundred fifty patients.

The Eustis Hospital has an endowment of two million dollars for the care of crippled and sick children. The Eustis gift also provides for a



EYE, EAR, NOSE AND THROAT DISPENSARY, EUSTIS HOSPITAL

convalescent home to be erected on the river about a mile below the University Hospital on land donated by Wm. Henry Eustis. The other units are financed by state-county patients, pay patients, or part pay patients; however, more than ninety per cent of the patients in the University Hospital come in under the County-State Law.

As the University Hospitals are teaching hospitals, great stress is laid not only upon facilities for the education of doctors, but also upon the education of nurses, dietitians, social workers, technicians, and others.

Laboratory services are complete and are under the supervision of experts in the various lines of service. The hospital is divided into five main divisions from the standpoint of medical service: Department of Surgery, headed by Dr. Owen H. Wangenstein; Department of Medicine, with Dr. J. C. McKinney as Secretary of the Committee in Charge; Department of Eye, Ear, Nose, and Throat, headed by Dr. Frank E. Burch; Department of Gynecology and Obstetrics, headed by Dr. J. C. Litzenberg, and Department of Pediatrics, headed by Dr. Irvine McQuarrie. All medical activities in the hospital being under the heads of these various departments and other services are operated around this general scheme. The offices of the chiefs of these departments are located in

the hospital, where necessary research laboratories have been established.

One feature of the University of Minnesota Hospitals is the centralization of laboratories, pharmacy, food service, record service, and all other services which can be centralized. All county and clinical patients are admitted through the Out-Patient Department, and have a complete physical examination. This makes them available for students in the Out-Patient Department as well as the students in the University of Minnesota Hospitals. A unit record system is used for both hospital and outpatients, which means that the hospital and the dispensary records are together. The Hollerith system of cross indexing has been adopted, and it is therefore possible to make a maximum use of records for research, reports, etc.

This institution is meant to serve as an educational center for the students in medicine, nursing, etc., but it is also active in the education of the public in medical matters. It has been our object to keep in very close contact with the medical profession of the state. Letters are written to physicians referring patients to the hospital, and the staff takes a very active part in short courses for physicians under the Extension Department of the University of Minnesota.

Medical groups are encouraged to hold meetings at the hospital.

We wish the doctors of the state of Minnesota and the surrounding states to feel that they are really a part of the faculty of the University of Minnesota, and that they have an interest in our students. We wish to operate the hospital in such a way that they will be glad to send their patients to the University Hospital for teaching purposes, knowing that the patient will still feel that his family physician is his best friend. We consider it improper for the University Hospital to educate doctors and then compete with them, so the development of private services has been encouraged and will be encouraged only to such an extent as desired by the profession. We do encourage consultation work. We want the men of the state to have enough confidence in the hospital and staff to be willing to send difficult cases in for diagnosis. All patients must be referred by a physician in practice.

Great stress has been laid on the Cancer Institute. At this time, the Out-Patient Cancer Department is treating approximately one thousand patients, who come from all sections of the state. This department meets the standards of the American Institute for Cancer Research.

In other words, the University of Minnesota Hospitals are strictly teaching hospitals. In addition to these facilities, the University of Minnesota Medical School makes use of the Ancker Hospital in St. Paul, the Minneapolis General

Hospital, the Glen Lake Sanatorium, and other institutions in the Twin Cities, for teaching purposes. This gives Minnesota a much larger number of active clinical beds than found in any other state university medical school.

While we appreciate the importance of having clinical facilities in connection with the University Medical School, all hospitals should be teaching centers. They should be the center of public health activities and the medical profession in the various communities should feel that the hospital in their community is the proper place for meetings of county medical societies and other medical meetings. Doctors should encourage the county and local communities to make use of their local hospitals for the care of the indigent, and they should be able to develop clinical centers in places far removed from medical education. This, of course, assures much better treatment for the patient in such hospitals, and I would be lax if I did not mention the fact that in most communities of the Northwest there is a hospital which could serve as a very important educational center for doctors, nurses, and above all, the public.

The public must learn to value the hospital as an important public service agency entitled to the same support as schools, fire departments, and even jails. It is for our protection, and can best serve if used as an educational center. The University Hospitals can, and should, be of real service to local institutions and to members of the medical profession.



AMPHITHEATRE, EUSTIS HOSPITAL

## The Post-Graduate Medical Short Courses of the University of Minnesota

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FOR some ten years, the University of Minnesota, through the administrative agency of the General Extension Division, has been operating highly specialized, post-graduate short courses for practicing physicians in the State of Minnesota. The work, on the whole, has been a co-operative enterprise in which the Medical School of the university and the Minnesota Medical Society participated. The faculty of the Medical School has been drawn upon for these services, and also specialists and experts from the profession in Minneapolis, St. Paul, and Duluth. The Mayo Clinic at Rochester, Minn., has also been most generous in its participation in the enterprise.

As one looks back over the history of the past ten or twelve years, it is interesting to note how the ideas and conceptions in regard to these short courses have been modified by circumstances. The fundamental idea was that medical science, in common with other sciences, is advancing with a considerable degree of rapidity each year. Busy general practitioners must, therefore, make extraordinary efforts in order to keep abreast with the new discoveries and the new techniques. The university authorities and the Education Committee of the State Society were concerned to devise means through which doctors practicing in regions remote from medical centers could be brought in touch with the latest methods and the latest knowledge. It was, of course, recognized that many doctors are in the habit, at more or less frequent intervals, of spending some time at famous hospitals or famous clinics for the purpose of pursuing researches or freshening their knowledge. The great mass of the practicing physicians, however, were not able to follow this practice.

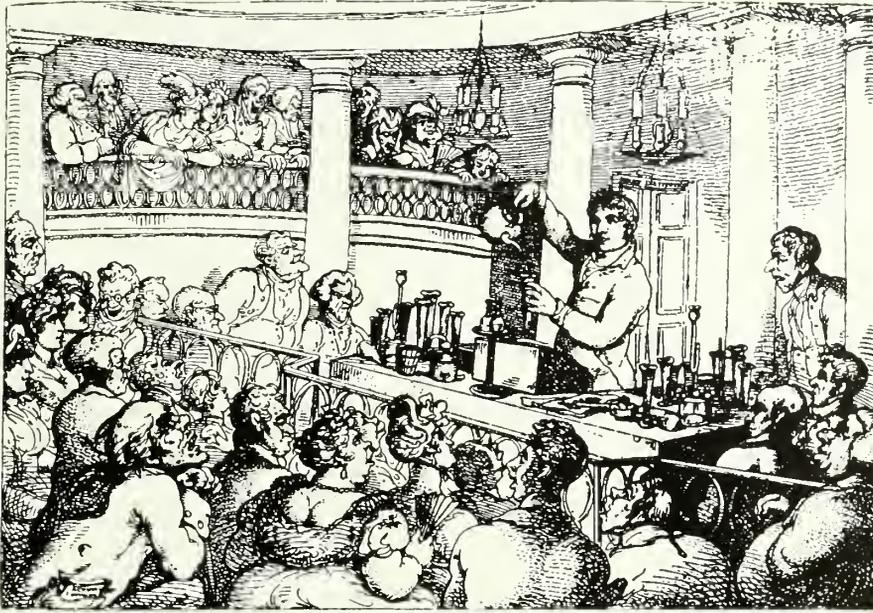
The first device at the university was to establish, two or three times a year, medical institutes lasting a week, and sometimes two weeks, during which two or three parallel courses of study could be pursued on a full-time basis at the University Medical School and at the several hospitals of the Twin Cities. The regular lecturers of the Medical School were used, with occasional outside help.

During these two-week periods, regular daily work was done in obstetrics, pediatrics, internal medicine, neurology, and other branches, and regular clinical work was done at the hospitals. In view of the shortness of time, the work was, of course, of an extremely intensive nature. On two occasions, a well-known specialist from the Harvard Medical School was brought on to conduct a special institute of one week in diathermy and physical therapy.

The response from the medical profession was very gratifying. Men came from considerable distances to attend these sessions and professed to have received great benefits from them. In two or three years of this kind of educational process, however, the committee in charge discovered a considerable diminution of interest and a notable falling off in attendance. Attempts were made to analyze the situation to discover the causes of this apparent lapse in interest. The conclusion was finally arrived at, that absence from practice for one week or two weeks on the part of the average general practitioner, especially in districts outside of the large population centers, is practically an impossibility. The doctor was usually willing to spend his time and money but he could not reconcile himself to neglecting his patients.

It seemed plain, therefore, that a change of plan would be necessary in order to obtain the results aimed at. If the doctors could not leave their practices to come to the medical center, then, in some way, the medical center must be taken to them. If they could not absent themselves from their patients for a week or two at a time once or twice a year, they could at least spend part of an afternoon and evening once a week at the nearby county seat.

It was determined, therefore, to let the county medical societies be the responsible sponsors of this educational enterprise in the several localities. The lecturers would be sent out at stated intervals and would meet the members of the county society at the county seat or at some centrally located point within the county. The



"CHEMICAL LECTURE"  
From Gunther's "Early Science and Art"

plan finally adopted, and the plan in operation at the present time, may be described somewhat as follows:

A twenty-four page pamphlet was prepared and issued by the General Extension Division, setting forth the details of the plan that had been agreed upon by the Medical School of the University and by the State Medical Association. A committee was appointed from the Medical School to co-operate with the Committee on Hospitals and Medical Education of the State Medical Association. These two committees were made responsible for the organization of these short courses, and the Director of University Extension at the University of Minnesota was appointed as the administrator. These committees undertook the task of selecting, with the best judgment possible, the most capable specialists and the most instructive and interesting lecturers on the several branches of medicine, who were available in the Twin Cities, Duluth, and Rochester. These men were then approached and asked if they would be willing to go out and give lectures and conduct clinics in the towns of Minnesota, on request, provided no unreasonable demands should be made on their time. Those who accepted were then listed in the above-mentioned pamphlet in accordance with their several specialties. Their names were listed and also the special subjects of their lectures. The topics were listed under the following general heads:

Bacteriology; Eye, Ear, Nose and Throat;

Internal Medicine; Nervous and Mental Diseases; Obstetrics and Gynecology; Oral Surgery; Pediatrics; Skin and Venereal Disease; Surgery.

In addition, there were such general lecture subjects as Hospital, Physiology, Public Health, and the State Medical Association. The cordial way in which these specialists and teachers co-operated in advancing this educational movement is indicated by the fact that the pamphlets issued in June, 1928, contained the names and subjects of 131 men.

The present plan admits of a much wider range of choice of subjects than did the former plan. Under the present plan, the county society, at one of its meetings, selects from the names listed in the pamphlet some eight or ten men who are to come at intervals of one week, and sometimes two weeks. The courses usually run from six to twelve weeks, the meetings being held once a week. Each meeting is on a different subject and has a different specialist in that subject to present the lecture and to conduct clinics with whatever material may be available.

At first, two lecturers were sent out for each meeting, but it was soon discovered that this did not give either man enough time in which to develop his subject. The general practice now, is to have one lecturer for the evening, and have a complete and thorough discussion of what he has to present. The lecturers make adequate preparation for the lecture and often illustrate the material with lantern slides. The numbers

in attendance vary from fifteen to thirty-five, and thus the groups are small enough to permit of easy and informal discussion. Naturally, the most popular lecturers are those who combine a thorough knowledge of the subject with ability to organize material, and an easy, clear, and forceful presentation. Here, as elsewhere, personality counts.

One feature of these medical short courses may be said to be unique. The men who deliver the lectures and conduct the clinics are not paid a penny for their services. It was discovered that the choice lay between full professional fees and nothing. If full professional fees were charged, then few county societies could undertake the financial outlay involved. The final outcome was that the lecturers agreed to contribute their services without compensation.

In practice, the county societies submit a list of six or eight lectures, usually setting forth first, second, and third choices for each date. The office of the Extension Division then figures out the cost involved in traveling expenses and entertainment. The lecturers are reimbursed for their outlay in traveling expenses. To the total of the expenses involved for the individual lecturer a small percentage for the overhead of the office is added, and this is the amount that the county society is asked to pay. It will be observed that the whole scheme is possible only because there is no expense involved in the way of salaries, or other forms of compensation. The county societies get the short courses on a cost basis with no professional fees involved.

Perhaps some actual examples would be of interest. Olivia took nine lectures in the autumn of 1930. The following subjects were dealt with, one subject each evening: one, Nephritis; two, Problems of the Every Day Gastro-Intestinal patient; three, Arthritis; four, Heart Disease; five, Diseases of the Chest; six, Anaphylaxis;

seven, Pediatrics; eight, Diseases of the Nose and Throat; nine, Discussion of the Various Psychoses from the Standpoint of the General Practitioner.

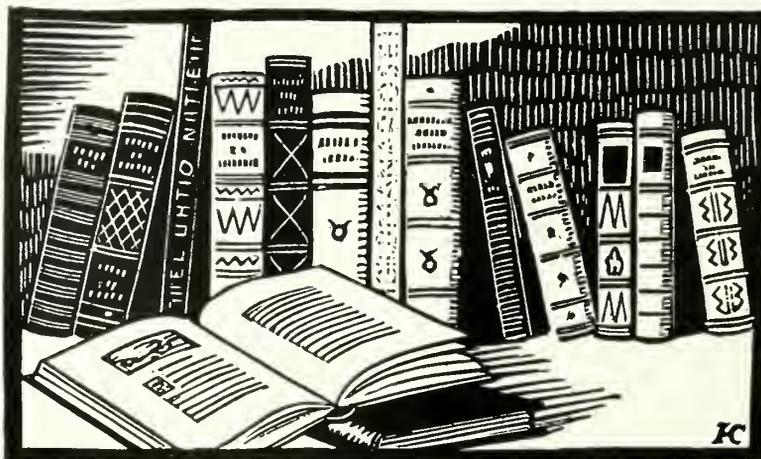
Olivia took another course of four lectures in the spring of 1932. The following subjects were discussed: one, Mastoiditis; two, Organic Disease of the Nervous System in Infancy and Childhood; three, Treatment of Acute Infections of the Extremities; four, Surgery. There will probably be two additional lectures yet to be secured.

During the year 1931-32, similar courses were arranged at Winona, Hibbing, Fulda, Marshall, and Fergus Falls.

The gratifying thing is that several of these county societies repeat their courses year after year and are thus bringing to the attention of their members expert information on a very wide range of subjects connected with medical practice.

We assume that the practice of medicine involves not only a technique but also a science. Both theory and practice are involved. Knowledge and application thereof must be considered. It is considered a profession because it proceeds from a body of verified data and scientific knowledge, tested and proved both in the laboratory and with actual patients. If the profession is still to advance, it will be because its practitioners and votaries keep pace with the contributions made to the knowledge of diseases and their causes by scientific procedures. It is essential, therefore, that all discoveries, all improvements of technique, all successful attacks on basic problems, be disseminated as rapidly as possible among those who must make the application in actual cases of sick people. It is for this purpose that the medical short courses of the University of Minnesota and the Minnesota State Medical Association are organized and administered. Success will depend

upon the co-operation of wise and intelligent men in the medical profession.



## Heredity as a Subject in the Medical Curriculum\*

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AS A PHYSIOLOGIST I have always been much interested in heredity; and since the rediscovery of Mendel's work and its extension, it has become, I believe, one of the most significant parts of biology. In fact, one has but to view the application of this work in the field of animal or plant industry to be convinced of its great economic as well as scientific importance.

However, I never thought of it much in connection with medicine until the time of the White House Conference. Dr. J. C. Litzenberg, of our faculty, made a report upon the first session to our medical faculty. After he had finished I asked him, "What did they say about heredity?" and he replied, "Almost nothing."

That aroused me considerably because I couldn't conceive of a conference being held on farm stock, for example, in which there shouldn't have been large attention to the matter of heredity, yet here was a great meeting called to deal with human stock and hardly a word was said about this subject.

I talked the matter over with our biologists in botany and zoology, and the instructors in the medical school, and they all, like myself, looked upon this as a very unfortunate omission. The result was that I went to Washington for the second medical conference to learn whether the first omission would be corrected. I found the subject of heredity was practically taboo. There were gathered, by the hundreds, the great in their fields, to study the children of America. Millions of dollars, it seemed, and millions of words were being expended on environment and not a cent nor a word for heredity. I asked the privilege of the floor and was refused.

I did write up a memorandum setting forth the opinions of the biologists of the University of Minnesota to the effect that heredity was important from the human standpoint, that too little attention had been paid to it at the conference, and that we hoped there might be held a future conference which would deal adequately with this subject. Secretary Wilbur read this memorandum into the minutes at the last session, and it was

referred to a special follow-up committee who are still following it, I presume.

A beautiful piece of English composition called "The Children's Charter" came out of that conference. Its nineteen separate articles are devoted to improving the child's environment. There is not a word about heredity.

I quote from one of the speakers: "No eugenic program is proposed. We cannot state what kind of persons we want in the world, so varied are we and so great our need of variety." I felt like countering, "The variety is evident, but the need of certain types is debatable."

"Although we know too little of human heredity," he continued, "to adopt a positive program . . ., we do know that some traits of a sort very disadvantageous to the individual and very harmful to society are so strictly inherited that certain persons should not reproduce their kind." And then he went on to say that the temper of the people does not favor a thorough program of sterilization and advised that we "press forward with our scientific studies, so that if the time comes when the public attitude on these matters shall change, more complete information shall be available upon which to base action."

This seemed to me the counsel of futility. As I said at Baltimore in speaking of this matter, it was as if he said, "Back to your laboratories, ye scientific hirelings! Get busy with your rats and guinea pigs! If the public ever gets interested in the question, they will come to you."

"Back to your cell, Martin Luther. If the people ever get interested in the Reformation they will come to you. Back to your type case, Mr. William Lloyd Garrison; back to your briefs, gangling country lawyer, Abraham Lincoln, and if the people ever get interested in freeing slaves, they will come to you."

But that wasn't the temper of the conference on the other side. Starting with the fertilization of the ovum, an event fraught with fate, they went gravely forward to recommend what should be done—environmentally—with the misfits and degenerates of the population. But they made no effort to shut the sluice-ways by which these mis-

\*Read before the meeting of the Association of American Medical College, New Orleans, November 30, 1931.

fits and degenerates, so far as they are due to heredity, come into being.

I became tremendously interested and I have been "spilling over" ever since. The memorandum, that some of you probably saw, in behalf of the Minnesota biologists was published in *Science*.

Some of you may say, "What has this to do with medical education?" Of course, it has nothing to do with medical education unless it has to do with the medical profession. I think heredity has a close relation to medicine—an increasingly important relation. I think doctors will have to be leaders in any effective program of eugenics or of the use of the facts of heredity for the benefit of the race.

It is perfectly plain to all, that biology divides itself into two major parts which deal with heredity and environment. Inevitably biology so divides because it postulates the organism as something separate from, and played upon by, all events which are around it—in other words, the environment. The organism—any organism—must be the result of an hereditary process sweeping through the ages by which it has come to its present place. Heredity and environment are Siamese twins; the one cannot exist without the other.

If you think about medicine, you will see that it is applied biology:—applied physics, chemistry and biology, just as our beloved Dean Vaughan used to say, but the parts of chemistry and the parts of physics that the doctor is interested in are those which relate to life, and are part of biology. So you can say in general that medicine is applied biology.

Which part of biology does medicine chiefly apply? Chiefly the environmental side. You can't get around this fact. Look at the medical journals; almost all the articles approach disease from the environmental side. I don't know much about the practice of medicine, but thinking of treatment I should say, from pills to prayers, it is all from the outside, all environmental—must be so, for the patient has his heredity already established.

On the diagnostic and prognostic sides, so far as I can learn from doctor friends, there is much more room for the application of facts of heredity. I suspect they could be applied still more if the histories of family diseases were better known. I suspect, in other words, that records of heredity for most patients are almost absolutely wanting. How many of us know very much even about our grandparents? It is apparent at once that if such

records are ever developed, the doctors will have to take the first step in their development and preservation.\* Personally, I think we ought to begin at once. I think the main facts about the heredity of every baby that comes into the world in our hospitals ought to be kept on record. Forty years later when the individual wants such facts, his grandparents and other relatives will be gone. Our students should be taught the importance of familial disease and the necessity of having records which go far back in familial history.

Heredity seems also to be of great importance on the preventive side. Even though the doctor doesn't receive adequate pay for it, no one doubts that it is part of his duty to prevent disease. This prevention, of course, deals with the generation now existent, with individuals who seek such services, but when you think about it, would you say it should deal less with the future than with the present generation?

I think everyone who considers this matter soberly and broadly will say that preventive medicine should extend to future generations as well as to the present generation.

I am not alone in this. I have here, but won't read them, quotations from Jelliffe and Stockard, and can easily find many more, from men who are physicians,—which I am not,—as to that side of the physician's responsibility.

I am discussing the whole question of familial and heredity diseases. The tragedies resulting from these were mentioned at Washington. I might mention specific ones, but will pass them by because the situation is doubtless better known to you men—mostly doctors—than it is to me.

The question is: are the physicians doing all that is possible to prevent the propagation of these diseases? Of course my only source of information is inquiry. Some of my doctor friends would say "yes," and some would say "no," and some would say, "The patient gets information when he asks for it." The latter attitude doesn't seem to me to evidence any strong feeling of obligation toward the subject. At any rate, I came to the conclusion, and believe very sincerely, that physicians know too little, think too little, and do too little to extend what we know of human heredity toward the betterment of the human family.

You probably saw newspaper items to the effect that the former King of Spain has for—

\*[I note that the records of the late Professor Dercum, in accord with his will, have been destroyed. I consider such destruction little short of criminal in so far as such records might bear on the progeny of his patients. They should have gone into a confidential system of familial information available to the doctors of the future. Better blackmail (which was the evil feared) rather than congenital taint of many defects and diseases.]

bidden his daughters to marry. The item I saw stated that the King had his daughters examined medically and learned that on account of hemophilia in the family, his daughters should not bear children. As a race betterment measure, therefore, the King forbade his daughters to marry, which caused a great deal of heartbreak because one of them was engaged.

The significant thing is that, according to the papers, it was the King who had his daughters examined. They didn't say the initiative for such examination came from the medical profession. I think physicians should have had the boldness and insight and the foresight to have given advice to that effect long ago, for the fact of hemophilia in this royal family has been known a long time.

I recognize that physicians have no legal responsibility as regards marriage—or at most, only in certain limited respects and in certain states. But as men possessing certain knowledge and enjoying certain opportunities, does not their duty extend very widely into the marital province? If the doctors knew of a prospective flood of epidemic and failed to warn, exhort, enjoin the people, where would they stand in public opinion? But the flood of defective heredity sweeps on through the generations. It is not like the flood of epidemics, transient and self-limiting.

Indeed, the natural tendency to self-limitation through the law of survival of the fittest tends to be circumvented and broken down through the efforts of modern science and philanthropy. The White House Conference, itself, will keep alive and bring to reproduction many an individual whom nature, uninfluenced by man, would destroy. I think the physician should know and should act in his great capacity of teacher—his most important function—more aggressively and persistently in these provinces of marriage and child-having than he has ever done before.

Of course, birth control isn't a eugenic measure nor a dysgenic measure. It depends upon what part of society is making major use of it. But there are hereditary implications, and this is a matter which I think our medical students are lacking instruction in and failing to form opinions on. I don't agree with Dr. Glendening who thinks that everybody knows all there is to know. I said, in writing a review of his book, that I thought not everyone had had the advantage of the "back alley training" which Dr. Glendening and I had enjoyed.

Sterilization is a eugenic measure, undoubt-

edly, and yet I find doctors who won't take any stand about it. Many doctors haven't a matured opinion upon it, and many of them say, "It doesn't amount to anything."

In Minnesota about five hundred feeble-minded women have been sterilized, and in California six thousand or more, yet doctors talk about that as a drop in the bucket. I can't see it that way. I am reminded of the story of the so-called "Disgenic Family," which you will find in the *Eugenics* magazine of about a year or a year and a half ago. I believe the family exists in Milwaukee. The grandmother came there in 1850, undoubtedly a feeble-minded woman. At present, of the forty or fifty progeny, there are so many paupers, criminals, epileptics, and every other form of degenerates among them as to more than equal the total number of individuals. The article asserted the cost of taking care of that family for the next five years would be \$50,000, and that the records show the expense would be doubled every five years. When you realize that, you couldn't call sterilization of the grandmother a drop in the bucket. You would rather speak of keeping the drop of infection out of the ocean of broth. According to that old illustration of the bacteriologists, you recall, if you should put one drop of bacteria in an ocean of broth, in five days the whole ocean would be polluted. Heredity works by reproduction, and reproduction works by geometric ratio. Hang that fact on the most prominent hook on your mental clothes rack and wear it at every possible opportunity.

All right, then. I come to the conclusion that doctors know too little about heredity, think too little about it, act too little about it. I think we ought to advocate and permeate the medical curriculum with as much knowledge of heredity and just as much mature opinion about its application as is possible. I have no program, but as I conceive it, somewhere the fundamental facts should be presented plainly and clearly to medical students, and the practical importance of the facts should be stressed. The rest should be left to the clinical teachers who should emphasize and teach it at every opportunity.

I believe that when we get to a better practice of medicine, heredity will be found just as practical a subject as environment, and that perhaps more—yes, I would say very much more—could be done for the future of the race through that part of medicine which is founded on heredity than from that part founded on environment.

## The Hospital as a Co-operative Agency in Social Service and Education

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THE modern hospital has considerable background in history and like all modern institutions represents an evolution from early beginnings to the present highly-developed co-operative organization for the conservation of life, the promotion of public health, and the dissemination of useful knowledge.

Hospitals as we know them, are as to organization, either municipal or private in nature, but both alike are co-operative in that they concentrate materials, equipment, information and effort for the benefit of the public in such a way as would be impossible under strictly individualistic endeavor. This, both from a social as well as economic standpoint, is in full harmony with human development. As civilization has progressed, individuals have more and more learned to combine their efforts for the greater good of all and for greater service to mankind. It is a strange coincidence that the only movements that do not lend themselves successfully to co-operative effort are those that are inherently selfish in their purposes. The medical profession and their agency, the hospitals, have attained high rank in modern society, because their main objective is public service. Hospitals are essentially the workshop where the physician applies his knowledge and skill to the problems of disease, making use of all the agencies with which nature and human ingenuity have provided him.

The successful practice of scientific medicine requires much of the mechanical, both for examination and for treatment. Marvelous instruments of precision, costing huge sums of money are required for thorough examination and accurate diagnosis. Surgical and medical treatment likewise require equipment and service much beyond the means of single individuals to provide. The hospital becomes the concentration point for many patients and many doctors who all make common use of this modern equipment and this specialized service, and thus efficiency and economy is promoted.

Every properly organized hospital is first concerned with the care of those who come to its

wards for treatment, but hospitals have obligations beyond this and these are largely educational. Here again, the co-operative nature of the hospital makes possible an effort which otherwise would be impossible. The concentration of many patients suffering from a variety of ailments and the grouping of thoughtful, carefully-trained, scientific physicians makes the hospital an ideal place for the training of nurses, interns, doctors and the public at large. This later function is one of the major tasks of the modern hospital and an obligation which no well-regulated organization will forego.

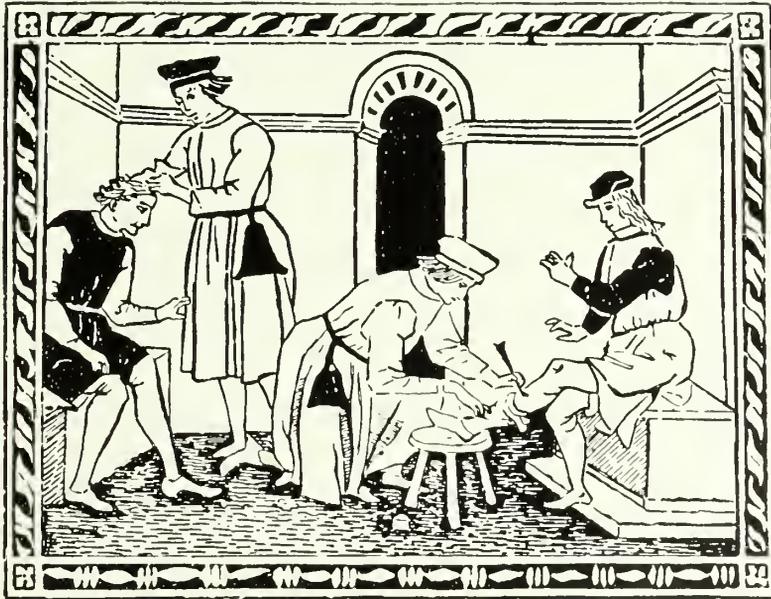
The doctor cannot perform his best service to his patients unless aided by intelligent well-trained attendants. The training of nurses, therefore, has come to be a necessity rather than a convenience. Modern medicine could not function without the nurse and hospitals everywhere have met the challenge. A training school for nurses is now almost as common an adjunct to a hospital as is x-ray equipment, and the demands upon her are almost as rigid. The progress of knowledge and changing standards are such as to require an alert, highly-educated and scientific direction delivering a product second only to the doctor in knowledge and skill. Here again the hospital is as important a factor as it is to the doctor in the care of his patients. Environment, equipment and material is provided for the practical application of theory and the finished product finds employment and gainful occupation, both in the hospital and the community, serving industry as well as the public in a score of different ways. Remove these technically trained members of society from its avenues of activity and it would be difficult, indeed, to continue the practice of scientific medicine, and public health would suffer immeasurably.

In the same way, medical schools no longer regard it as justifiable practice to send students into the field with merely a theoretical equipment, expecting them to acquire skill by means of the "trial and error" system of education. The best schools require their students to spend a year in

direct contact with the problems that they may expect to meet in actual practice, but under the watchful eye and the skillful direction of experienced men, qualified and willing to teach and to present the highest standards of the profession. Here, too, the hospital supplies the needed laboratory. No where else could the aspiring intern in so short a time and without harm to human beings get the practical experience so necessary for the successful practice of his profession. Disease and injury are made concrete through observation. Treatment has been practical rather than hypothetical. At the close of a well-directed internship year, the young doctor may, with a large degree of assurance, undertake the obligations of safeguarding the public health. Modern society will not tolerate a hit-and-miss method of medical practice and the hospital provides the means to satisfy enlightened intelligence.

But the hospital not only affords educational opportunity for nurses and interns. The physicians who participate in the work are themselves constantly brought into contact with the mass

problem, thus through discussions, clinics, observation and opportunity for research, they are enabled to keep alert and informed and the public is the ultimate beneficiary. The modern hospital is not a hotel, but it is a place which offers the skillful physician every opportunity to apply his art to the best advantage. It is a place to which the sick may go with full assurance that they will not be exploited, admitting to practice only doctors of known and established integrity, guaranteeing the patient the best in medical care that science and experience has attained. It is a place that unfolds to the world, knowledge that may be used in the ages yet to come, to preserve health and relieve bodily ills. It is a teaching institution with large and important obligations to discharge. It serves society, because modern society has need for such service. Along with the telephone, the electric light, the automobile and the apartment house, the hospital has become a public necessity and along with the schools provides a public service which cannot be had except through a concentration of intelligence and equipment.



EARLY HOSPITAL SURGERY

*From Cumston's "Introduction to the History of Medicine"*

THE  
JOURNAL-LANCET

REPRESENTS THE MEDICAL PROFESSION OF  
MINNESOTA, NORTH DAKOTA, SOUTH DAKOTA and MONTANA

THE OFFICIAL JOURNAL OF THE

North Dakota State Medical Association	The Minnesota Academy of Medicine
South Dakota State Medical Association	The Soo Railway Surgical Association
The Hennepin County Medical Society	The Sioux Valley Medical Association
North Dakota State Health Officers' Association	
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### Sixty-one Years

Since the first appearance of The Journal-Lancet sixty-one years ago, there has been much improvement in medical education. Progress has been particularly rapid in the Northwest during the last few decades. Some of the articles in this number show the splendid plants existing for undergraduate medical education in the Dakotas and Minnesota.

Dr. Ohlmacher and Dean French have pointed out the excellent work of the medical laboratories of North and South Dakota, as well as their splendid facilities for training medical students. Dean Scammon and Dr. Litzenberg have brought us to date on the developments at the University of Minnesota. From these articles, one is convinced that we now have excellent provisions for the training of undergraduate medical students in the Northwest. As one looks over the old curricula of these schools one sees the addition of new courses of study from time to time. In Dean Lyons' article attention is called to the needs of a course on Heredity for undergraduate medical schools, thus showing that progress continues.

Osler pointed out the great need of medical education of the doctor in practice, he says, "*But the family doctor, the private in our great army, the essential factor in the battle, should be carefully nurtured by the schools and carefully guarded by the public. Humanly speaking, with him are the issues of life and death, since upon him falls the grievous responsibility in those terrible emergencies which bring darkness and des-*

*pair to so many households. No class of men needs to call to mind more often the wise comment of Plato that education is a life-long business."* Again he says, "*But the more serious problem relates to the education of the practitioner after he has left the schools. . . . Habits of systematic reading are rare, and are becoming more rare, and five or ten years from his license, as practice begins to grow, may find the young doctor knowing less than he did when he started and without fixed educational purpose in life. . . . The doctor's post-graduate education comes from patients, from books and journals, and from societies, which should be supplemented every five or six years by a return to a post-graduate school to get rid of an almost inevitable slovenliness in methods of work."*

Dean Jackson has called attention to the splendid facilities which have been provided for physicians to take graduate courses leading to degrees. He has also shown the great demand for such work which is a healthy sign for the medical profession.

Mr. Fesler and Mr. Norby have pointed out the place of the hospital in medical education, not only for the undergraduate student but also for those engaged in graduate work. These teaching institutions are being used to great advantage for practitioners who desire to spend a short time in studying certain groups of cases. Dr. Price calls attention to the splendid work which has been done by the Minnesota State Medical Association and the Extension Division of the University of Minnesota in taking courses of study to local and district medical societies. This development is quite new and has been greeted with enthusiasm by physicians and offers numerous worthwhile possibilities.

In all of this work, the Editorial Board of The Journal-Lancet takes great pride. As one looks back over the volumes of this journal one is amazed at the large number of articles which have

appeared from time to time on the various phases of medical education. The encouragement which these articles provided, we feel must have had much to do with the development of medical education in the Northwest. In looking through these volumes, one is also amazed to see the large number of articles dealing with the practice of medicine, articles which are highly scientific and which present new material, new thoughts, and new ideas, and also numerous articles summing up our knowledge on various diseases; thus making an attempt to keep its readers informed on the most approved and modern methods of diagnosis, treatment and prevention of disease. In going over these volumes one cannot help but feel that The Journal-Lancet has done much in the Northwest to prevent the development of some of the conditions among physicians which Osler feared and has filled, at least in part, the need which he saw so clearly.

J. A. M.

### Birth Control

The question of birth control is being discussed more and more. It will no longer do for the medical profession to ignore this movement which is now sponsored largely by lay organizations and is making great headway all over the world.

Physicians have so often been importuned to interfere criminally with life between conception and birth that the result seems to have been a universal repulsion for the whole subject and a sweeping condemnation of all forms of birth control without distinction.

Abortions are not sanctioned by the medical profession except for urgent therapeutic purposes, and it does not appear to be the intent or purpose of the birth control movement, as now more or less openly advocated, to change this view. It is rather to urge the intelligent use of contraceptive measures, for the good of humanity and the improvement of the race, in cases where there are good and sufficient reasons, because of some impairment, why offspring should not be had.

The question has undoubtedly been evaded by some because of its delicate relations to problems of church and state. But why should this be such a deterring factor? The medical profession has always championed the cause of morality and respected religious views and usages; it has recognized the rights of society and heeded legal enactments in all its dealings with the sick and the well, and may be counted on to do so in the future. There is, thank God, a deep-rooted abhorrence for any meddling with the natural processes of

life, but this did not come to the medical profession through any law, nor any creed, nor any religion; it came through daily conflicts with, and struggles against, the enemies of life. These valiant defenders should now make their voices heard wherever matters of this kind are being considered.

The heresies of one generation may become the orthodoxies of the next, and open-minded tolerance of the views of others is a commendable virtue. Abstinence has never been considered immoral, and it is actually imposed as a requirement of certain religious leaders, yet abstinence is a form of contraception and birth control. Is it not proper to question whether life, and the processes that make for life, should be held equally sacred?

To prevent the mating of incurably insane is a duty we would seem to owe to posterity. Sterilization of degenerates is provided for by laws in many states. If therapeutic abortions are justified, then why not therapeutic contraceptions? No problem is solved by shunning it. Medical men must give attention to this subject. They should be willing to discuss it openly and express their views.

It is deplorable that we have no pedigreed humans. It would seem deplorable, too, if birth control should take on the form reported from Russia. It is almost unthinkable that fetal life could ever be appraised so lightly in America.

Eugenics needs, above all else, the guidance of the medical scientist.

A. E. H.

### Arterial Occlusion and Angiospasm

Two great factors are contributing today to a growing understanding of, and improved treatment in, peripheral vascular disease. The first of these is our accelerating knowledge of the autonomic nervous system; the second is in better methods and apparatus available for clinical study.

A generation ago attempts were made to influence exophthalmic goitre and glaucoma by surgical attacks on the cervical sympathetic system but these came to no permanent usage, although they did add to our knowledge. Fifteen years ago periarterial sympathectomy was tried for causalgia, and later by the same surgeon, Leriche, for other disturbances thought to be of vasomotor origin. In 1924 Hunter and Royle of Australia, did lumbar sympathetic ramisectomy for relief of certain cases with muscular spasticity, but later work has shown that the spasticity is relieved only temporarily if at all. The observation they made

at that time, however,—that the foot on the side of ranisectomy became warmer—has started a number of observers on studies which promise much advance in our methods of control of vasospasm. As a further by-product of their work is the brilliant control now possible in certain cases of Hirschsprung's disease—megacolon.

The recent development of the oscillometer which records pulsation in an extremity, but more especially of the thermocouple which records skin temperatures after five seconds of application, affords us instruments furnishing objective data concerning the state of the peripheral circulation, and this information can now be secured within the limits of time available for clinical observation. When a local disturbance in arterial blood supply occurs in a limb the first consideration is whether it is due to occlusion of the artery or to spasm. Simple clinical observation has helped for generations in differentiating the more clearly marked instances of each, but some of the spastic types sooner or later have given evidence of occlusion, as sometimes seen in late stages of Raynaud's disease, and in some instances clearly marked occlusive phenomena such as may be seen in Buerger's disease, have appeared to be accompanied by angiospasm.

In the more slowly developing occlusion accompanying atheromatous changes in arteries, especially of the legs and feet, the collateral circulation seems to develop best, and in some individuals may be of such a character that gangrene is avoided, though a major artery may be involved. Since the integrity of the tissues involved depends in so great measure on prompt development of all possible collateral circulation, the element of angiospasm needs immediate recognition and prompt control.

The study of this subject was greatly stimulated by Geo. E. Brown's monograph on thromb-angiitis obliterans five years ago, and has been pursued by an increasing number of workers since then, until it is now advanced far enough so that methods of differentiating with reasonable accuracy are available to anyone interested.

In the Archives of Internal Medicine for December Scott and Morton of Rochester, N. Y., show that the treatment for the occlusive and the angiospastic types of vascular disease in the extremities should be along radically different lines. For the former type, the treatment is to obtain a more peripheral distribution of the reduced amount of blood available. In angiospastic disease the local circulation may be augmented by

overcoming sympathetic vasoconstrictor spasm.

Several methods are available. Hyperthermia by baths or by diathermy, while general in their nature, include the affected extremity and cause vaso-dilatation which usually outlasts the temperature disturbance. The parenteral injection of foreign protein is likewise effective, but the method is not well borne by many and there is danger of thrombosis. Interruption of the local nerves by blocking is growing in use, and gangli-onectomy abolishes vasospasm permanently in the region supplied by vasoconstrictor fibres from the ganglion. Our knowledge of this field is still limited, but our methods of recognition and of management will be now rapidly improved.

S. M. W.

## SOCIETIES

### Grand Forks Medical Society

The annual meeting of the Grand Forks District Medical Society was held in Grand Forks, N. D., on Wednesday, January 13, 1932. At the afternoon session Dr. Irvine McQuarrie, Professor of Pediatrics at the University of Minnesota, gave a pediatrics clinic at the Deaconess Hospital. In the evening Dr. McQuarrie gave an address at the dinner meeting on "Some Recent Observations on the Management of Convulsive Disorders in Childhood." A large attendance was present to hear Dr. McQuarrie both in the clinic and at the evening meeting.

Following the address of the evening the annual business meeting of the Society was held, presided over by Dr. John H. Moore, Grand Forks, the retiring president.

The following officers were elected:

Dr. G. D. Gertson, Grand Forks, president,  
 Dr. Frank E. Weed, Park River, vice-president,  
 Dr. J. E. Hetherington, Grand Forks, secretary,  
 Dr. M. B. Ruud, Grand Forks, treasurer,  
 Dr. H. G. Woutat, Grand Forks, censor,  
 Drs. Ray O. Tomkins, Grafton, and H. O. Ruud and John H. Moore, Grand Forks, delegates.

### Fracture Symposium

The Minneapolis Surgical Society and the Regional Sub-Committee of the Committee on Fractures of the American College of Surgeons will jointly conduct a symposium on fractures on February 3 and 4.

The first meeting will be under the direction of the Fracture Committee and will be held in the auditorium of the Hennepin County Medical Society at 8 P. M., February 3. At that time the subject of fractures in general will be discussed by representatives of the hospitals and the University of Minnesota.

On Thursday, February 4, Dr. Kellogg Speed of Chicago will be the guest of the Minneapolis Surgical

Society. He will give a clinic with demonstration of cases at the Minneapolis General Hospital at 10 A. M. He will speak to the medical students at 2 P. M. in the Todd Amphitheater of the University Hospital.

The annual formal meeting and banquet of the Minneapolis Surgical Society will be held at the Nicollet Hotel February 4, 6:30 P. M. Following the banquet Dr. Speed will deliver the annual address.

All these meetings are open to all members of the profession in good standing. Reservation for the banquet must be made with the secretary, At. 5579, before 5 P. M. February 3. Banquet tickets \$2.00.

H. O. MCPHEETERS, M.D., Secretary-Treasurer.

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### American College of Physicians

The program for the Sixteenth Annual Clinical Session of the American College of Physicians to meet in San Francisco the week of April 4, 1932, is virtually completed. Mr. E. R. Loveland, the Executive Secretary, will send out copies sometime early in February.

All physicians, irrespective of membership in the College, are invited to attend this session. The program is of such a character that it will interest everyone, whether specialist or general practitioner. The session will be attended by many notables in medicine from the United States and Canada.

More than sixty papers and addresses will be presented revealing the trends and covering the best of the recent work in medicine. The physics and physiology of arteriosclerosis and hypertension will be discussed by the man who has made the greatest recent contribution in this field. Papers on congenital narrowing of the aorta and pulmonary arteriosclerosis, and on diseases of the chest and liver will be presented.

There are studies on the mechanism of edema formation in disease; on leukopenia; on the action of benzol, Roentgen rays and radium on the blood and blood-forming organs; on the relation of paranasal sinus infection to disease elsewhere; on the clinical significance of the atrophic tongue and on arthritis with a summary of the results of treatment. Diseases peculiar to the Rocky Mountain and Coast countries will be emphasized in this general program.

The outstanding symposium of the session will bring to clinicians the results of the almost unbelievable advance in our knowledge of the involuntary nervous system.

While Monday morning will be devoted exclusively to registrations, the remaining mornings from Tuesday to Friday, inclusive, will be given to clinics and demonstrations in institutions in and about San Francisco. Dr. William J. Kerr, Professor of Medicine at the University of California Medical School, is General Chairman. The opportunity to study at first hand the work of the Hooper Foundation for Medical Research under the direction of Dr. Karl F. Meyer would alone make attendance at this meeting worth while, but this is only one item in a program of unusual significance.

On one or two mornings, for those interested in the

history of medicine in general, or of the far West and Pacific Coast in particular, interesting exhibits and talks have been prepared.

The session will be attended by the Fellows and Associates of the College from the entire United States and Canada, but it is the desire of the College that the opportunity be given for every physician who desires to attend. The guest fee of \$15.00 includes one year's subscription to the *Annals of Internal Medicine*, the official journal of the College, in which the papers and addresses read during the session will be published.

A cordial invitation is extended to the readers of *The Journal-Lancet* to attend this session. Provision has been made by the local committee for entertainment of friends and members of the families of Fellows, Associates and guests at the meeting.

S. MARX WHITE, M.D.

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### The Coming Meeting of the Medical Society of the Missouri Valley

The Medical Society of the Missouri Valley will hold its annual meeting this year in Omaha, March 29, 30, and 31. Headquarters will be in the Hotel Fontenelle.

Those attending last year's meeting, held in Des Moines, proclaimed it as one of the most interesting of the many held by the Society since 1873. The program was well balanced and the entire proceedings well handled by the local committee.

The purpose of the Society is to bring to the physicians of the middle west a program such as would be attainable only by traveling some distance and with the outlay of much time and money. In other words, the Medical Society of the Missouri Valley brings to your backyard what you would travel far to get.

Societies with such purposes are becoming more popular and are enthusiastically supported by the physicians in whose territory they serve. Naturally it is only through large attendance that such organizations can prosper and hope to build the better meetings of tomorrow.

The Medical Society of the Missouri Valley has made steady progress since its reorganization in 1928. Last year it was changed from the membership type of organization with yearly dues to one calling only for a registration fee of \$5.00 for those attending the meetings.

This year's program is practically complete. Physicians representing different sections of the practice of medicine and country have accepted invitations to be with us. The next issue of this journal will contain the program.

Among those already having accepted invitations to address the Society are: Drs. J. C. Bloodgood, Baltimore; F. Lahey, Boston; Loyal Davis, Chicago; Alvarez and Hemholz, Rochester, Minn.; A. Kuntz, St. Louis, and Burt Shurly, Detroit.

Remember the above dates. Make this, if no other, the convention to be attended. It will be worth your while.

## NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Dr. R. D. Evans, Minneapolis, was recently married to Miss Lucille Lusk, of Mankato, Minn.

Another hospital has been opened at Glenwood, Minn., with Dr. S. J. Thorson as medical director.

Dr. W. C. Allison, a well known practitioner of Whitefish, Mont., died last month at the age of 38 years.

Dr. E. L. Goss, Kyle, S. D., has moved to Montesano, Wash., where he will open offices for general practice.

Dr. C. A. Durkee, Lidgerwood, N. D., has moved to Fairmount, N. D., and will continue in general practice.

Dr. A. W. Eckstein, Mankato, Minn., has been appointed county physician of Nicollet County, starting January 1, 1932.

Dr. A. W. Brazda, formerly in practice in Nebraska, has become associated with Dr. G. H. Spielman, at Mandan, N. D.

Dr. E. C. Stone, Minot, N. D., will spend the next few months in Europe, where he will take a special course in head surgery.

Dr. E. M. Larson, Great Falls, Mont., has been honored by being elected president of the Chamber of Commerce of that city.

Dr. E. H. Loenholdt, St. Paul, a graduate in 1930 at the University of Minnesota, has located at Hector, Minn., for general practice.

The new John Burns Memorial Hospital at Belle Fourche, S. D., has been entirely completed and will be opened to the public next month.

Dr. E. Z. Shapiro, Duluth, gave a very interesting talk before the members of the Cloquet Rotary Club, upon his recent travels in Europe.

Dr. Leander Simons, a recent graduate of the University of Minnesota Medical School, has opened offices for general practice at Pierz, Minn.

Dr. Chas. H. McDonell, Winona, died recently in that city at the age of 54 years. For nearly

20 years he was in active practice at Hankinson, N. D.

Dr. F. G. Watson, who has been in active practice at Worthington, Minn., for the past 20 years, died at his home in that city, at the age of 60 years.

Dr. J. A. Thabes, Brainerd, was again honored by re-election as president of the Minnesota State Board of Health, at the annual meeting recently held at St. Paul.

Dr. D. Lemieux, who has been located for the past year at New England, N. D., has returned to his old home town and resumed active practice at Bowman, N. D.

Dr. O. M. Spencer, formerly connected with the U. S. Public Health Service in California, has been appointed Medical Director for Montana and North Dakota.

Paul H. Fesler, superintendent of the University of Minnesota Hospital for the past five years, will go to Northwestern University Hospital at Evanston, Ill., as superintendent.

Dr. F. A. Brusegard, who has been on the staff of the General Hospital, Minneapolis, for the past few years, is now associated with the Medical Block Clinic at Red Wing, Minn.

Dr. C. A. Stewart has been elected Chief of Staff of the Swedish Hospital, Minneapolis. Dr. Stewart succeeds Dr. C. O. Maland, who entertained the entire hospital staff at a banquet.

Plans have been completed for a \$65,000 addition to the St. Joseph Hospital at Mitchell, S. D. Work will be started at once, so that it will be ready to occupy early in the coming summer.

Two new doctors have located at Brookings, S. D., for general practice since the opening of the new year. Dr. M. C. Tank coming from Texas, and Dr. A. N. Whitney, from Illinois.

Dr. Edgar N. McGiffert, who has been in active practice at Duluth for over 40 years, died last month after a short illness. Dr. McGiffert was a graduate of the Hamilton Medical College, New York.

Dr. Thorvald Holen, died at his residence in Minneapolis, on January 13th at the age of 57 years. Dr. Holen was a graduate of Hamline University, and had been in active practice here since 1902.

Dr. B. J. Gallagher has been elected president of the Waseca County, Minn., Medical Society, and Dr. W. C. Bernstein, New Richland, vice-

president, and Dr. John L. Tavenner, Waseca, secretary-treasurer.

Dr. L. J. Alger, McClusky, N. D., physician for the last six years, will leave soon for Vienna, Austria, where he will study eye, ear, nose and throat work for one year. Dr. Alger recently disposed of his practice and equipment to Dr. W. G. Rogne.

Dr. O. T. Benson, Glen Ullin, N. D., was elected president of the Sixth District Medical Association of North Dakota at a meeting held in Bismarck, and he succeeds Dr. W. L. Diven of Bismarck in that office. This district includes seven Slope counties and approximately 40 physicians attended the meeting.

Any foundation for a perfect health unit in the community must rest upon a basis of close co-operation between the physician and the pharmacist. Dean Frederick J. Wulling of the University of Minnesota College of Pharmacy told members of the Hennepin County Medical Society and Minneapolis retail druggists at a luncheon meeting of the society.

Dr. F. E. Harrington, Minneapolis, health commissioner, has been appointed a member of a national committee on the protective care of tuberculous children by Alfred Henry of Indianapolis, president of the National Tuberculosis Association. The committee, made up of leaders in tuberculosis prevention work for children, will meet in New York February 4.

Dr. Edward Bratrud of the Bratrud Clinic, Thief River Falls, Minn., has recently added to his staff Dr. Lucien G. Culver, recently associated with Doctors Larson, Wheeler and Wold at St. Paul in the practice of eye, ear, nose and throat; also Dr. Charles W. Froats, who recently completed a two-years' Fellowship in Gynecology and Obstetrics at the University of Minnesota.

Trustees of St. Peter's Hospital, Miles City, Mont., have accepted from Mrs. Augusta Kohrs a new surgical unit, reported to have cost \$175,000. The building, three stories high, is a memorial to her husband, the late Conrad Kohrs, a pioneer in the state's livestock industry. It contains a surgical ward, obstetrical ward and radio laboratory and is equipped with the most modern facilities available.

Dr. J. F. D. Cook, Langford, S. D., was elected president of the Northwest Regional Medical conference at the annual meeting held at St. Paul on January 24th. Vernon D. Blank,

Des Moines, general manager of the Iowa State Medical Association was elected secretary. The next annual meeting of the conference will be held in St. Paul. About 50 representatives of medical organizations of nine states attended the meeting.

At a regular meeting of the District Medical Society held at Devils Lake, N. D., last month, Dr. H. F. Emert of Sarles was the principal speaker. Dr. W. C. Fawcett, Starkweather, and Dr. John Graham, Devils Lake, also gave talks before the group. Following the dinner, officers were elected for the coming year as follows: Dr. T. L. Laugerson, Cando, president; Dr. R. H. Beek, Lakota, vice-president, and Dr. G. F. Drew, Devils Lake, secretary and treasurer.

Eight applicants were granted licenses to practice medicine in North Dakota as result of their successful completion of examinations given by the State Board of Medical Examiners. The list, announced by Dr. G. M. Williamson, Grand Forks, secretary of the Board, are: Robert W. Vance, Northwood; Adelai A. Brink, Donaldson, Minn.; Freedolph E. Anderson, Underwood.; Virgil T. Evault, Williston; Lester P. Veigel, New England; Theodore Q. Benson, East Grand Forks, Minn.; Clarence V. Bateman, Wahpeton, and Maude E. Gedes, Zeeland.

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters). SPEAKER: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month of February will be as follows: February 3rd—Personal Hygiene—Food Selection; February 10th—Buerger's Disease; February 17th—Prevention of Goiter; February 24th—Is Cancer Inherited?

Dr. John H. Moore of Grand Forks has been appointed an assistant examiner of the American Board of Obstetrics and Gynecology. The purpose of the board is to conduct examinations to determine the qualifications of physicians who seek recognition as specialists in these fields. Dr. Moore's territory includes Minnesota, North and South Dakota, Idaho, Montana and Wyoming. Physicians in Grand Forks stated the appointment was regarded as a high honor in the medical field and Grand Forks will become one of 18 cities in America where these examinations are given.

## CLASSIFIED ADVERTISEMENTS

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Experienced graduate of A-1 school. Thoroughly capable of general surgery. Age 38. Will only consider highly desirable and ethical association. Address Box 890, care of this office.

## POSITION WANTED

Experienced laboratory technician would like position in clinic, hospital, or doctor's office. Experienced in X-ray and physio-therapy. Some nursing experience. Address Box 882, care of this office.

## FOR SALE

Nelson's Loose Leaf Surgery and Medicine, kept up-to-date. In A-1 condition. Sold together or separately. Bought in 1927 and 1929. Cash, half price. Address Box 888, care of this office.

## EYE, EAR, NOSE AND THROAT SPECIALIST

Eye, ear, nose and throat specialist willing to assist in general practice and surgery. Wants association with busy physician or surgeon. Address Box 887, care of this office.

## TECHNICIAN

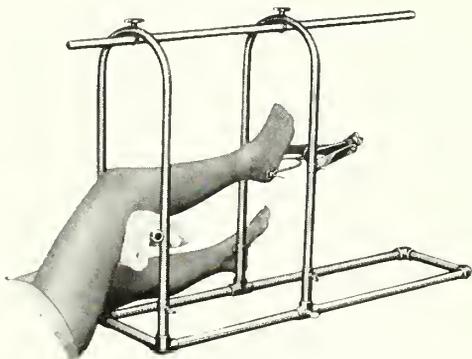
Young lady technician would like position in clinic, hospital, or doctor's office. Experienced in X-ray, physio-therapy, and all clinical laboratory methods. Some nursing experience. Outside of Twin Cities preferred. Good references. Address Box 889, care of this office.

## FOR RENT

Modern physician's office for rent, joint reception room with busy dentist. Present physician going away. Located over busy drug store on busy corner of 26th and Central Aves. N. E., Minneapolis. Equipment optional; low rent for this excellent location. Call Ludwig W. Larson, Dinsmore 0522, Minneapolis.

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Doctor's office occupied by prominent physician. Office elegantly equipped. Individual treatment room, laboratory, etc. Reception room is shared with dentist and other physician. A new up-to-the-minute medical building, located in one of the best business intersections of good residential district. This is an unusual proposition and must be seen to be fully appreciated. Address Box 877, care of this office.



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Represents the Medical Profession of  
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**North Dakota and South Dakota State Medical Associations**

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## Ovarian Pregnancy: Report of a Possible Case Developed to the Eighth Month\*

H. A. MILLER, A.B., M.D., and J. J. HEIMARK, M.A., M.D.  
*Fairmont, Minn.*

**I**N REVIEWING a series of excellent articles on ovarian pregnancy as well as several case reports, I was impressed by two outstanding findings:

First, the extreme rarity of the occurrence of ovarian pregnancy and second, the fact that the first reported case of ovarian pregnancy occurred in our time.

Norris and Mitchell reviewed the literature in 1908 and found fifteen positive, fifteen highly probable, and nine fairly probable cases. In June, 1926, Mayme reported a case, and at this date estimated twenty cases of ovarian pregnancy. Since this date a few more proven cases have been added to the list. In 1927, Strezoff reported a case. He stated that Dorsel described ninety-two cases as cited by Zimmermann in 1927. There seems to be a slight discrepancy in these figures. However, it is still justifiable to state that the occurrence of ovarian pregnancy is rare.

The first recorded case of ovarian pregnancy, including the histology of the case, was made by Catherina Van Tussenbroek in 1899.

In 1878, Spiegelberg formulated the following criteria to which primary ovarian pregnancy must conform:

1. The tube on the affected side must be intact.

2. The fetal sac must occupy the position of the ovary.
3. The fetal sac must be connected to the uterus by the utero-ovarian ligament.
4. Definite ovarian tissue should be found in the sac wall. Williams has since modified this last statement by declaring that ovarian tissue should be found in different places of the sac wall at some distance from each other.

### *Case Report:*

The patient, Mrs. L., came from Iowa and consulted my associate, Dr. H. A. Miller, on May 28, 1930, because of a large abdomen.

She was twenty-three years old. She had been married four years and had never been pregnant. Her parents, three brothers, and one sister, were living and well. None of her family were dead. Her past medical history was essentially negative, and she had always enjoyed good health except for an occasional sore throat, which had been cured by tonsillectomy.

The menstrual history dated back to the age of fourteen. This was a regular 28-day type and lasted from three to four days. No dysmenorrhea, and she had never missed a period up to the date we saw her, May 28, 1930. Her last period was on May 15, 1930.

The menstrual history aroused our interest very much, because, in her story of the enlarged

\*Presented by Dr. J. J. Heimark at the annual meeting of the Southern Minnesota Medical Association at Faribault, Minnesota, August 24, 1931.

abdomen, she stated she had consulted a doctor in Iowa in October, 1929, who at that time told her she was at least five months pregnant. The breasts were enlarged and contained milk. The doctor had told her he could feel fetal movements of which the patient had been aware even earlier.

During the month of August, 1929, she had experienced occasional morning nausea but no vomiting. On July 10, 1929, she was very sick with severe pain in the lower abdomen. This severe pain lasted about a week and subsided gradually, though the abdomen remained tender and uncomfortable. She was compelled to walk bent forward. Saw no doctor concerning this discomfort. No nausea nor vomiting with the attack.

From October, 1929, until May 28, 1930, at least seven months later, when we first saw her, she stated the abdomen had not increased materially in size over what it had been since October, 1929. Outside of the discomfort of the enlarged abdomen she felt well. The appetite was good and there was no food distress. The bowels were regular. No urinary symptoms. No edema of the feet. The pulse was 70, temperature 98, blood pressure 130-90. Urine was acid sp. gr. 1022, clear, alb. 0, sugar 0, micro. 0. She was a medium-sized, fairly nourished woman, and was in no distress. The chest was negative, and there was no secondary areola of the breasts, which also appeared normal in other respects.

The abdomen was enlarged by a rather firm, abdominal tumor that extended well above the umbilicus. No fetal movements could be felt, nor heart sounds heard. The cervix felt firm, but the uterus could not be identified. No particular tenderness in the abdomen. At the completion of the physical examination we felt we were dealing with an ovarian cyst, and were further convinced of this after an X-ray was taken which showed no signs of fetal skeletal structures.

The operation was performed under spinal anaesthesia with novocain on May 31, 1930, at the Fairmont Clinic & Hospital.

The abdomen was opened by a low mid-line incision. The right ovary and tube were normal. The uterus was normal in size, shape and consistency and was pushed to the right by a smooth, rounded mass measuring approximately 10 by 9 by 8 inches, which occupied the left side of the abdominal cavity from the level of the umbilicus

downward. The flattened left tube was stretched across the anterior wall of the tumor and measured approximately 8 inches in length and  $\frac{3}{4}$  of an inch in width.

The fimbriated end of the tube was attached and incorporated in the sac of the tumor, but its orifice was not open. There was no gross evidence of inflammation of the tube. The tumor was attached to the uterus by the utero-ovarian ligament. The left infundibulo-pelvic ligament was connected with the under side of the tumor. In releasing the tumor from the posterior parietal peritoneum a portion of the left ureter was exposed. The tumor and left tube were removed in toto. The left ovary was not identified. The patient was dismissed from the hospital on the fourteenth post-operative day. She made an uneventful recovery, and the wound closed per primum.

The tumor was given to the pathology department of the University of Minnesota for demonstration purposes. The following is the gross and microscopic report from Dr. J. S. McCartney of the Pathology Department:

"The fetus in the case of Mrs. L. measures 40 cm. A mass composed of placenta, amniotic sac, and tube, collapsed, measured 12x11.5x7.5 cm. On one side of this there is a cordlike structure about 16 cm. in length and 1 cm. in diameter which appears to be tube. The fimbriated end is inseparably incorporated in the wall of the amniotic sac in the region of what appears to be placenta, which measures 12x10x3 cm."

"New sections were made from the placenta, tube and the wall of the amniotic sac. The old sections have also been reviewed. These sections show, aside from gross hypertrophy of the tube, a possible slight evidence of inflammation in the mid portion of it. Section from the placenta shows old degenerated chorionic villi, which in places are partially calcified. The ovary is not identified grossly, but in the section just mentioned, there appears to be a small amount of compressed ovarian tissue overlying the degenerated placenta."

In conclusion, although the fetus had been dead for some time and showed considerable shrinkage and maceration, it still measured 40 cm. in length, which would seem to indicate that it was, if not a full-term pregnancy, at least one well over eight months.

## Acute Strychnine Poisoning: Cases with Recovery

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**S**TRYCHNINE poisoning is one of the conditions which the practicing physician may be called upon at any time to diagnose and treat. When the patient presents active symptoms, he must be treated with promptness and with courageous doses of antagonistic drugs. If this is done, every patient has a good chance for recovery even if toxic from very large doses, since the drug does not cause permanent pathologic changes but only temporarily increases the permeability of the impulses at the synapsis. If the patient is protected from the drug for about five hours, he will recover completely.

The frequency with which strychnine is taken by accident and with suicidal intent is about equal. In the United States census report of 1909, strychnine poisoning was given as the cause of death in 210 cases.<sup>1</sup> Of these, 113 were suicidal and 97 were accidental. Strychnine is well known to the public as a poisonous drug and is rather frequently used in criminal poisoning. It is also the most frequent cause of poisoning of children, due to the accidental ingestion of cathartic tablets containing strychnine, which are taken as candy because the pills are sugar-coated. One writer<sup>2</sup> pointed out that the strychnine was unnecessary in these tablets, and that its intended action was a pharmaceutical fallacy. He also advocated that the sugar-coating be abandoned, and that the public be educated to keep medicines out of the reach of children.

The poison may be introduced by hypodermic injection or through the gastro-intestinal tract, the latter being by far the most common. By the subcutaneous method, the symptoms appear in twenty minutes;<sup>3</sup> by the gastro-intestinal method they appear within thirty to ninety minutes. The time will be shorter if the poison is taken in liquid form or if the stomach is empty; and it will be longer if it is taken in solid form, as in a capsule, or if the stomach is filled with food.<sup>4</sup> Harley,<sup>5</sup> in 1869, reported an unusual but interesting case of poisoning in an infant through the medium of the mother's milk. The mother was taking a therapeutic mixture of strychnine but was without symptoms herself.

The toxic dose varies according to the method of ingestion and to the degree of individual sen-

sitiveness. The minimum lethal dose is usually given as one-fourth to one-half grain. Larger doses are frequently taken with recovery,<sup>6</sup> probably because of delayed absorption, increased excretion, and decreased sensitiveness.

The diagnosis is made easily, of course, if there is a history of the ingestion of the drug. The early symptoms encountered are restlessness and nervousness. The nervousness is noticeably auditory, and the patient complains of any type of noise, such as talking, walking about the room, and the opening and closing of doors. He does not want anyone to touch him. This is followed by stiffness of the muscles of the face giving a *risus sardonicus*. Shortly thereafter general convulsions set in, lasting about one or two minutes, and these are followed by a period of relaxation, lasting a few minutes to half an hour.<sup>7</sup> After five or six convulsive seizures, death usually follows from exhaustion, or from respiratory failure.

The treatment depends upon the facilities available. The treatment at the hospital, where all facilities are at hand, will differ from the treatment at home or other places of onset of symptoms. The patient should be treated where he is found. He should not be put in an ambulance or moved about, since such manipulation may cause a fatal convulsion. He should be protected from all external stimuli such as light and noises. For hospitals various writers have recommended various treatments. Cutler and Alton<sup>8</sup> succeeded in controlling the convulsions of a one-year-old baby by injecting intraspinally, under ether anesthesia, a solution of magnesium sulphate. They followed the method of Meltzer<sup>9</sup> for tetanus cases, using the 25 per cent solution (1 cc per 20 pounds of body weight and half doses for children). They then proceeded with a series of experiments on cats showing that magnesium sulphate had a profound effect as a depressant on the nervous system, and that the convulsions of strychnine could thereby be controlled. Simultaneously, Meltzer, with Peck,<sup>9</sup> demonstrated that magnesium sulphate intravenously had a marked anesthetic effect on the nervous system in human beings. The other depressants that are used are well known; namely, bromides, paraldehyde, chloral hydrate, and morphine.

If the patient is having convulsions these methods will not be sufficiently available or prompt enough in action, and the patient must be put under anesthesia at once either with chloroform or with ether. If sufficiently anesthetized, a gastric lavage should be done repeatedly, and liquids should be given to promote elimination. Since the strychnine does not cause permanent pathological changes, but merely increases the permeability of the synapse, the patient needs only to be kept under the influence of depressants and anesthesia until the strychnine has been eliminated or destroyed, which usually takes about five hours.

The following case was considered worthy of recording since the dose taken was accurately known and since such large doses of depressants were necessary to control the convulsions:

Case 1. A housewife, 28 years of age, weighing 105 pounds, swallowed, by accident, a capsule containing 3 gr. of strychnine at 10 P. M. At 11:45 P. M. she complained of extreme nervousness. Shaking of the bed, walking on the floor, or hearing the voices of others in the room would arouse her, and she would beg them to be quiet. At 12 o'clock the patient had a tonic convulsion with opisthotonos and frothing at the mouth. There was a very deep cyanosis, and the pulse was imperceptible. This convulsion lasted for thirty seconds, and she was then unconscious for another thirty seconds. Five minutes later there were clonic convulsions from noises in the street. At 12:05  $\frac{3}{4}$  gr. morphine was given hypodermically, and 40 gr. of chloral hydrate with 100 gr. of sodium bromides were given rectally. The hypodermic helped very little, and she was put under full chloroform anesthesia until the bottle was consumed. She was then given ether anesthesia until she had a secondary dilatation of the pupils, and even then it was difficult to secure relaxation. If the anesthesia was lightened she immediately went into convulsions. At 2 o'clock she was given another full grain of morphine by hypodermic injection, and at 4 o'clock,  $\frac{1}{3}$  gr. morphine. The severe convulsions stopped about 4 A. M., but in spite of all this medication, she had about one hundred mild convulsions in a period of twelve hours.

During all this her mind functioned normally excepting, of course, during the convulsive seizures. It seemed impossible to give her a lavage because of her sensitiveness and because

of the fear that any manipulation would start a fatal convulsion, even during the anesthesia. Twelve hours later the convulsions had entirely ceased. The heart was fibrillating on the following afternoon, but it has not been fibrillating since. During the first attack it seemed very obvious that she was dying. She had a sardonic grin, and the cyanosis was so intense that the entire body was black. When the treatment was started it was decided to give her enough sedatives to control the convulsions, regardless of the amount, to prevent a fatal exhaustion. Mention might be made that although her menstrual period had been delayed five days, it had returned on the following day. For 48 hours after the control of the convulsions, the patient complained that she felt sore and stiff. After the third day, she had recovered entirely with no apparent bad effects.

Case 2. Dr. A., a physiological chemist, had analyzed some tablets which were supposed to contain overdoses of strychnine. The tablets which he analyzed were found to contain the normal amount. He took another one by mouth to prove the test. About one hour later while sitting at the intern's table eating supper, he complained that the talking was too loud and begged for silence. He tilted his chair slightly backward and held it in this position. He would not allow anyone to move him from the chair or to put him to bed. He was given two hypodermics of morphine and seemed to relax sufficiently with these. Fortunately the dose here was not very large. He had apparently not considered the possibility that some of the tablets might contain larger doses of strychnine than the others.

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## Chronic Arthritis\*

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CHRONIC arthritis may be divided into two distinct diseases—rheumatoid arthritis and osteo-arthritis. Synonymous terms for the former are atrophic and infective arthritis and arthritis deformans; for the latter hypertrophic arthritis.

Clinically, the rheumatoid type includes the Still's Disease of children which may resemble acute rheumatism in its onset, but gradually will become chronic. In adults the onset is gradual—sometimes very insidious—but there is always, in the beginning, evidence of inflammatory reactions.

In the fingers it usually begins in the second phalangeal articulation and results in a spindle-shaped deformity. The small bones of the wrist are frequently involved. In the feet the corresponding articulation is usually involved. Any joint, including the maxillary, may be effected. The involved part is often cold and atrophic, with secondary contractions, and ankylosis may readily develop. This is the crippling type of arthritis. Remissions characterize its course, giving evidence that the infection has subsided. In some cases the disease may subside with only moderate disability.

Heberden's Node is a good example of osteo-arthritis. Spur-formation is a characteristic of this disease, and these formations are exceedingly common on the spines of people after fifty years of age. The grating knees of fat women are of this type. It rarely cripples as there is never a true ankylosis; impaired movement being due to interlocking of the osteophytes.

Pathologically, in rheumatoid arthritis the joint early presents evidence of an inflammatory process, with round cell proliferation of the synovia, followed by connective and finally fibrous tissue formation which replaces the cartilage. If such a joint is fixed by splint or cast, ankylosis rapidly develops. The round cell infiltration invades the periarticular structure leading to the characteristic spindle-shaped deformity.

In osteo-arthritis there is no evidence of an inflammatory process, but rather a degeneration of

the cartilage with secondary development of osteophytes.

This suggests a different etiology for the two types, which is further confirmed by bacteriological studies. Streptococci may be obtained from the blood stream, joint fluid, and adjacent lymph glands in rheumatoid arthritis. Apparently there is not a specific streptococcus, but rather a variety of strains that may be the etiological factor in this type.

Cultures from osteo-arthritis are negative. Timbrell Fisher has given an excellent definition of osteo-arthritis: "It is not a disease *sui generis*, but a physiological response to some form of irritation either mechanical or chemical." Mechanical irritation, or trauma, is apparently the most frequent cause. These changes may develop in young people from acute trauma, but it is usually a disease of advanced years, and age represents repeated mild trauma.

The primary focus of infection in rheumatoid arthritis is highly speculative, and unnecessary removal of teeth should be avoided. In any case, after the infection has reached the joint surface it may be too late to remove the primary focus.

The treatment of rheumatoid arthritis is first an effort to destroy the infection. This is a difficult, and often impossible task. In addition to giving a general mixed diet, we use cod liver oil freely for its Vitamin A, which has an effect on infection.

We have found typhoid vaccine, given intravenously, the most efficient method of destroying infection. Unfortunately, this is only too frequently not successful. Early treatment is most important. Daily movement of the joint to prevent ankylosis is most important. Weight bearing on the joints should be avoided.

Since osteo-arthritis is non-infective, removal of foci of infection does not play a role. Weight bearing here should be limited, but movements of joints maintained. Painful exercises should be avoided as this means further traumatization of the joint.

### DISCUSSION

DR. FRANK I. DARROW (Fargo, N. D.): Dr. Miller said he felt all these old foci of infection were inactive. I wonder how he would explain the terrific flare-ups we

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sometimes get when we stir up these old foci of infection. We have all had the experience of pulling out teeth and having a considerable flare-up, not only locally, but in the joints as well.

DR. JOSEPH L. MILLER: I think you have opened up a wound, and that comes from the germs that go in from the mouth. It doesn't prove that they came from the abscess.

DR. DARROW: I think Dr. Miller misspoke himself at one time in regard to rheumatoid arthritis never becoming disabling.

DR. MILLER: I said or meant to say the osteo-arthritis.

DR. DARROW: I am sure you meant that. I certainly think that we are in agreement with Dr. Miller that there are these two distinct clinical types, but personally I am in a position where I would still like to leave the question open as to whether osteo-arthritis is due to infection or not. One reason for this is the recent work in specific vaccine therapy, in which probably the most prominent work is that of Burbank and Christian, whose article appeared in the *Journal of Bone and Joint Surgery*. These men make specific vaccines from foci of infection, and through a somewhat complicated process of titering the patient for complement, they decide which patients are apt to be more favorable for this type of vaccine. The vaccine that is given sometimes has multiple organisms in it, but it is a very small amount. In fact, in the giving of this type of vaccine, reaction is avoided. They start with about 5,000 bacteria, which is so small an amount that we formerly would have thought we were not going to get any good from the vaccine by giving such a small amount. If this small quantity of 5,000 gives a reaction, they do not give the same dose again, but reduce it. However, if the patient improves, the dose is gradually increased. This vaccine is never given at intervals closer than a week apart.

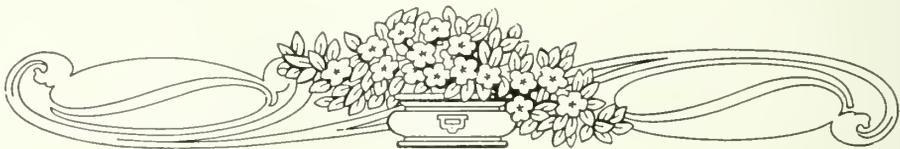
Strange as it may seem, this type of vaccine therapy has about as good results in the osteo-arthritis as it has in the rheumatoid type.

There is one thing I want to mention, and that is the universal optimism among the men who are in the advance guard working with this terrible affliction, which is really a sociological problem. I think we should all gather some hope from these men who are out ahead of the rest of us, and take heart from their results, and not just pass them off.

I want to make one warning with regard to treatment. A great many have been in the habit of using cinchophen derivatives for these conditions, and in some cases get nice results, but the experience of those who have used a great deal of it teaches us to be very careful because of the terrific damage that it sometimes does to the liver.

Another thing that I want to call to your attention, which I think will be of help to the general practitioner, who is searching for some sort of outline to follow in treating these cases, is a small book written by Bernard which is called "Chronic Arthritis and Rheumatoid Infections." This, together with the book by Trimble, that Dr. Miller mentioned, is a good late book on the subject.

One thing that I want to bring out and would like to ask Dr. Miller about is the use of X-ray therapy in these conditions. We all know that X-ray is being used in other types of infections, such as erysipelas and boils, and we have found considerable relief in these rheumatic conditions from the use of X-ray treatment. We find that it relieves the pain in the joint and apparently assists in stopping the process. At any rate, it allows earlier manipulation of these joints. In a small series we found marked relief in 60 per cent, slight relief in 17 per cent, and no relief in 20 per cent of the cases.



## Medical Care of Veterans

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THE medical care of veterans is one problem of the day which has engaged the attention of most doctors. We will here cover only enough of the background to enable us to consider intelligently the present status of the problem.

After the war, in lieu of pensions, the Government undertook to give care for all service-incurred disabilities of veterans. At first this care was given in civilian hospitals under contract. The arrangement was not entirely satisfactory and, for that and other reasons, the Veterans' Bureau launched its program of building hospitals for veterans. In 1925 it became evident that the rush of post-war care for service disabilities had been passed, and in July, 1926, Congress provided for hospitalization with traveling expenses for non-service-connected disabilities of veterans *where space was available*. Soon waiting lists were the rule, and, in response to the increasing demand, the Veterans' Bureau has undertaken a program of building to accommodate all veterans disabled from any cause—according to some reports an intended increase from about 35,000 beds to about 129,000 beds, or more if necessary.

In 1930 Dr. H. H. Shoulders, appreciating some of the implications and dangers of the program, went to the Legion and then to the American Medical Association with an alternative plan, amounting to the furnishing of paid-up health insurance policies to veterans. It was not favorably received then, but in 1931 his plan was approved by the American Medical Association, and a committee was formed to sponsor it. The Legion, however, at its 1931 convention, refused to consider the Shoulders plan.

In November, 1931, sensing that perhaps the program of the Veterans' Bureau might have serious disadvantages, the Legion National Committee appointed a committee of three to confer with the special committee of the American Medical Association and others with regard to possible modifications of the plans for medical care of veterans. The first meeting was held at Indianapolis on November 30th, 1931, the second meeting was held at Chicago on December 30th, 1931, and a third meeting was held at Wash-

ington on February 1st, 1932. When this is printed we may know the results of these conferences, if any. It is hoped that at least some points of agreement will have been found.

One proposal coming from within the Legion is surely worthy of our support. The Minnesota Department of the Legion, as part of the so-called "Minnesota Plan" has advocated the care of veteran emergency cases in their home communities by their home physicians in their home hospitals. Experience had proved that patients with conditions such as acute appendicitis, pneumonia, or ruptured peptic ulcer were liable to die in case any attempt was made to transport them 100 to 300 miles to a veterans' hospital. Patients with certain other conditions not so extremely serious are also nevertheless not transportable. Such patients (veterans) living far from the nearest veterans' hospital suffer a relative handicap. Surely those of us in the Legion can help our posts to support the "Minnesota Plan."

Now, with regard to the problem of the medical care of veterans in general, it seems to me: that cases of tuberculosis and the psychoneuroses should be cared for in veterans' hospitals because it is hard to prove service-connection and impossible to prove lack of it, and also because there are definite medical reasons in favor of the care of such cases in veterans' hospitals; that there are definite reasons for caring for general medical and surgical disabilities of non-service-connected origins at home or close to home because:

(1) Such care would be for the best interests of the veteran and his family. Removal of the veteran from all contact with his family for any considerable time is very bad for the morale of the veteran and of his family and tends to destroy family cohesion; the danger of transportation and delay in treating of emergency cases has been mentioned above; the relative and increasingly great injustice to veterans living at greater distances from veterans' hospitals has been mentioned—this is particularly evident in respect to care and observation often needed after discharge from the hospital.

(2) Care of veterans in their home communi-

ties would help the civilian hospitals, most of which are even now having serious financial difficulties, to remove some 3,000,000 men from the potential clientele of these hospitals may ruin some, and in the others will raise the cost per patient for the remaining population.

(3) Care of veterans in their home communities will prevent the threatened establishment of a type of state medicine which would undermine the private practice of medicine, and build up a federal bureaucracy almost or entirely beyond control.

(4) The Veterans' Bureau program for care of all disabled veterans in government hospitals would be unfair to the general public because: it is an extremely expensive program which must be paid for by the taxpayers; its accomplishment would tend to demoralize a considerable part of the citizenry by disrupting families; and it would raise the civilian hospitals' costs for the whole population—we all pay for the civilian hospitals and their upkeep either directly or indirectly and we cannot look on calmly to see them partly emptied and made idle by construction of a great duplicate mass of equipment.

Now what has all this to do with us as doctors, especially those of us who served in the war? As doctors or in our medical societies we can accomplish but little alone. But much can be accomplished if those of us who are in or eligible to be in the Legion will do our part toward creating harmony and unity of purpose between the Legion, the American Medical Association, and the American Hospital Association. We should remember that we can be active as members of our Legion posts, of our hospital staffs, and of our county medical societies. Our arguments, if we present them justly, should appeal to all three groups.

One last caution should be remembered. No agreements have been reached regarding the details of the various proposals for medical care of veterans. Discussions between the different organizations are quite liable to result in modifications and compromises. If we are to help we must keep ourselves informed regarding developments, and must treat with consideration the ideas of those in the various organizations who approach the problem with different points of view.

## A European Medical "Exposure"

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IT IS safe to say that a medical career is hardly complete without a glimpse into foreign methods of healing and foreign ways of living. The educating value of a look into the other man's house is sometimes priceless. Although it may not always give rise to an epoch-making idea, nevertheless it frequently lends to an understanding of things which is immeasurably useful in gaining a better perspective of life and work.

In a review of the 1931 European Assemblies of the American Interstate Post-Graduate Medical Association, certain apologies are necessary. Due to the writer's respect for brevity, only the most interesting incidents of the tour will be mentioned, and even they will have to suffer from lack of as complete a description as they perhaps warrant. Inasmuch as there were two sections to the assemblies, the surgical and the medical, no attempt is made to cover the former because most of what the writer witnessed concerned the medical aspect.

Prior to the time of sailing, a day was spent at

McGill University, Montreal, where Prof. Meakins took the group on ward rounds. He showed a variety of interesting cases and finished his clinic by a visit to the post-mortem room. Here we witnessed an autopsy on a fatality from coronary thrombosis. The surprise element came when the stomach was examined and found to contain a crater-like ulcer about the size of a quarter which had given no ascertainable trouble to the patient and which had entirely escaped clinical notice. It impressed upon us the ease with which pathological processes can escape our notice unless we examine much further than our suspicions go. We were informed that about 60 per cent of the deaths here are autopsied.

A half day was spent at the Osler Library where the spirit of that great and beloved physician continues to exert its wholesome influence upon students of medicine. As you all know, Osler began his career at McGill; from there he went to Philadelphia, then to Baltimore, and later to Oxford where he died in the midst of the

scholars and books he so greatly admired and respected. His ashes were returned to McGill University where they rest underneath a panel bearing his portrait in bronze, close to his books, the face turned toward his earlier collections, while at his back are the books of his later years. To visit this interesting library and be guided through it, hearing the fascinating anecdotes of Osler's life by the librarian, Dr. Francis, is a rare privilege for book-lovers. The library contains 7,600 volumes of choice books picked by a master.

The European clinics began in London in the rooms of the Royal Society of Medicine. Sir Thomas Horder delivered the first paper entitled, "Medical Hints." This was followed by an able presentation on "Head Injuries" by Dr. Donald Armour, surgeon. He emphasized the fact that hemorrhage is a most important element in the production of symptoms in head injuries. In the treatment of both the acute and chronic head injuries, he advised the more frequent use of cerebral puncture. He strongly advised against operation during severe shock.

One of the best papers, in my opinion, given in London was that of Dr. Goodall on "The Myocardium in Right Ventricular Failure." He first brought out the interesting fact that angina pectoris pain is the only pain with a "deadly feel" to it; that is, a stab that makes the patient believe that death is to follow. Further than that, the electrocardiogram tracing during the anginal attack and that just before death is similar in appearance. The T wave is inverted in all three leads.

Dr. Goodall tied up very intimately the relationship of right ventricular function with right bundle branch disturbance, showing how interference with the latter caused diminished efficiency of the right ventricle. In 1533 cases of mitral stenosis which he analyzed, he found right bundle branch block in 155.

He stressed the relationship of the right ventricle to the stomach. The former, resting on the diaphragm just above the stomach, becomes pressed upon and thereby disturbed when the latter organ fills with gas. This source of disturbance in heart disease deserves careful consideration when it is remembered that 80 per cent of those suffering from cardiac disease first get their symptoms after meals, and that 70 per cent of heart cases die at a period closely following a meal. The conclusion is that the stomach must always be watched in the treatment of heart disease.

At the Middlesex Hospital, Dr. W. Sampson

Handly, surgeon, gave an instructive paper entitled, "The Causation of Cancer." Illustrating his opinions by lantern slides of cancerous organs and research work which he himself had carried out, he presented the view that cancer, which occurs in inactive tissue, accompanied by lymphatic block, is always preceded by chronic lymphangitis. Lesions such as papilloma and adenoma are precancerous lesions and have as their basis of origin chronic lymphatic obstruction. It is this latter condition, then, that he feels is the determining factor in the causation of cancer. Unfortunately, there was insufficient time for completely convincing the listeners of the full merits of this viewpoint, which undoubtedly carried with it facts deserving of very serious consideration.

Dr. Abel, surgeon, presented a splendid paper at the Royal Society of Medicine entitled, "Cancer of the Rectum." He stated that those treated with radium die faster than those not treated. His operation of choice was the abdominal-perineal route. He reported that 77 per cent recovered without recurrence after a five-year period. His method of selection of cases and preparation for operation was considered essential in obtaining his good results. Only one in three cases coming to the dispensary were operable. Determination of the cardiac energy index of the patients was used routinely to ascertain their fitness for operation. The 25-75 per cent range of this index was considered a safe surgical risk. Below 25 per cent or above 75 per cent marked the case as unsafe. The cardiac energy index was determined as shown by the following example, the systolic, diastolic, and pulse pressures being the factors involved.

Systolic Blood Pressure.....	120 mm.
Diastolic Blood Pressure.....	80 mm.
—	
Pulse Pressure .....	40 mm.
Pulse Pressure .....	$40 \times 100 = 50$
Diastolic Blood Pressure.....	80 1

The "50" represents the cardiac energy index and falls within normal limits. Dr. Abel believed this to be a most valuable adjunct in judging the patient's suitability for operation. Moreover, any patient with a hemoglobin of less than 50 per cent, or a red blood-cell count of less than four million always received a blood transfusion before operation.

Rounds were made at the National Heart Hospital after which Dr. Goodall presented a pathological specimen of rare occurrence. It was a heart, not greatly enlarged, but having huge

coronary varicosities, approximately an inch in diameter, extending over its surface. It was interesting to learn that no symptoms of heart disease had been complained of in this case, and that, one night at a social function, the woman, suddenly excited by an emotional disturbance, died instantly. Post-mortem examination was negative except for the heart condition as described.

The next city visited was Birmingham, England. At the General Hospital, Prof. Wilkinson lectured on, and demonstrated by film, a case of ectopia cordis. The heart pulsating through a defect in the anterior chest wall was clearly shown. Dr. Stanley Barnes showed an interesting film on "Shell Shock." The bizarre, exaggerated, and groping movements, mostly of the legs, in these unfortunate victims, were well-illustrated. The cause of the condition was given as a subconscious desire never to return to battle. The cure depended upon satisfying this desire without causing the patient shame or harming his pride.

Prof. Wynne of Birmingham University presented a paper entitled, "The Vaccine Treatment of Pneumonia." In his treatment, an attempt was made to stimulate the formation of non-specific anti-bodies early in pneumonia by injecting a vaccine as soon as the first symptoms were noted. In lobar pneumonia, the vaccine used was one prepared from the various strains of pneumococci. In influenzal pneumonia, the vaccine was obtained from the pneumococci, streptococci and influenza bacilli—200 million organisms of each to 1 cc. of the vaccine. The dose used was 1 cc. hypodermic injection given preferably within the first 24 hours of the disease. The temperature would usually return to normal in 24 to 48 hours. A number of charts were shown illustrating the fall of temperature and relief of symptoms experienced by the patients receiving this treatment. Results were approximately the same in lobar and broncho-pneumonia. If the vaccine were administered within the first three days, 95 per cent recovery resulted. If given later than that, from the third to the ninth day, 80 per cent recovered. Of 320 cases treated, an average of 88.5 per cent were cured.

Such results in the treatment of pneumonia are almost too good to believe. Scepticism on the part of the audience was evidenced and was justified on the grounds that the past vaccine treatment of pneumonia has not been generally approved. Before being fully accepted, it would

appear that further investigation of this work be made in order to evaluate its true worth.

In the out-patient department of the Birmingham General Hospital, a number of interesting cases were shown, including that of a dermoid cyst of the posterior mediastinum lying between the pericardium and right auricle. It had previously been removed successfully from this dangerous position, and the patient had made a good recovery. A case of myeloid leukaemia was shown in a four-year-old child. It is most unusual to have this condition develop at such a tender age. A case of myositis ossificans was presented. There are only about one hundred such cases reported in the literature. The disease is characterized by progressive inflammation of the muscles accompanied by the formation of bony masses in the muscles, tendons, or in the bony framework. There is no effective treatment for it.

The important place of plastic surgery as a life-saver was demonstrated by Dr. Sampson, surgeon, who presented a case of plastic reconstruction of the oesophagus. The patient had swallowed a cupful of lye which resulted in a severely stenosed oesophagus, thereby practically preventing any food from entering the stomach. A new oesophagus was constructed from the skin of the anterior chest wall, and attached to the old oesophagus above the clavicle and to the jejunum below. It lay on the anterior aspect of the chest wall next to the sternum where the physiology of the act of swallowing in an artificial oesophagus could well be studied. It functioned very well and the patient suffered no great inconvenience in its use.

At the Queen's Hospital, Birmingham, Dr. Eden lectured on the subject of bone transplants into the subcutaneous tissue for tetany. This form of treatment, which originated in Germany, is reputed to raise the blood calcium to such a state of permanency as to relieve the symptoms of this disease. A small piece of ox bone is boiled and transplanted into the subcutaneous tissue of the breast, which, for no known reason, stimulates the calcium metabolism and raises the blood calcium. A number of cases were presented to testify to its efficacy. The cases, however, had not been under observation sufficiently long to warrant great optimism over the trustworthiness of the results. Further time and study were required to judge of its true value.

Dr. Christopher Martin, surgeon, former student and associate of R. Lawson Tait, gave an interesting biographical sketch of his former teacher, Lawson Tait, the great pioneer surgeon, is

credited with having performed the first successful operation for tubal pregnancy and is considered by many to be the father of aseptic surgery. He quarrelled with Lord Lister over the value of antiseptics in surgery, believing that they were of no value in preventing wound infection. Tait, by thoroughly washing his hands, instruments, and the abdominal wall of the patient before a laparotomy, was able to get fewer surgical infections than was Lord Lister with his antiseptic sprays. It took years to prove that, to a certain extent, both were right in their contentions. The great influence that Lawson Tait exerted in the field of surgery is a matter of history, as is also his chequered career.

The most interesting part of our stay at Liverpool was the afternoon spent at the Liverpool Medical Institute. Prof. W. Blair Bell presided at this meeting.

Dr. R. MacKenna presented a paper on Bismuth Therapy that is well worth mentioning. He stated that lupus erythematosus treated by intramuscular injections of bismuth oxychloride resulted in a cure in 65 per cent of these cases within a six-months' period. The possible application of bismuth to the treatment of tuberculosis was suggested in consideration of the following facts: (1) tubercle bacilli are killed quite readily in vitro by dilute solutions of bismuth; (2) lupus erythematosus is believed by many to be tuberculous in origin and, as shown, responds remarkably well to this form of treatment. Likely, however, its value in pulmonary tuberculosis will always remain as a mere conjecture.

Dr. Henry Cohen lectured on, and demonstrated by cinematograph film, the value of encephalography and ventriculography for the diagnosis of cerebral and cerebellar tumors. He would remove the cerebro-spinal fluid from, say 250 mm. pressure, to 100 mm. and would then inject an equal amount of air. X-ray films taken would show the course followed by the air, and any obstruction such as a tumor could be well demonstrated. The result of a successful removal in a 15-year-old boy of a frontal tuberculoma about as large as a tennis ball, with uneventful recovery, was shown.

At the Liverpool Royal Infirmary, a number of cases of blackwater fever were shown. The disease was recognized by the following signs and symptoms: a dark urine, a large spleen, anemia, icterus, fever, and a very ill and apprehensive patient. Anuria was given as the main cause of death, and this is prevented by keeping the urine

alkaline so that no granular deposits occurred, as these cause urinary obstruction.

The great prevalence of disseminated sclerosis in the British Isles was the cause of much comment. Practically every hospital visited had a number of these cases, and we were informed that anyone in that part of the world developing nerve trouble after twenty years of age very probably had disseminated sclerosis. The cause of this disease is believed by many to be due to a deficiency of vitamins and other cell-stimulating substances, therefore the treatment employed was a diet rich in liver, fresh vegetables, and fruits, and containing ergosterol. Good results are claimed by a number of capable physicians from the application of such a regimen.

What might be called "silent pathological lesions"; that is, those giving no clinical evidence of their presence, are always a source of interest and wonder. Dr. Hays at the Royal Infirmary, in a lecture on pregnancy and cardiac disease, showed the heart of a woman who had died from cerebral thrombosis. She had passed through a pregnancy two weeks before death with no difficulty. It is true that slight cyanosis and some clubbing of fingers were present, but no other evidence of heart disease could be discovered. Post-mortem examination showed a congenital cardiac lesion—a perforation, the size of a dime, in the upper part of the ventricular septum. Its presence had not been suspected or detected during life.

From Liverpool, the group crossed the Irish Sea and landed at Dublin. Here we received a warm welcome from Sir Wm. Wheeler who is recognized as one of Ireland's leading surgeons. He demonstrated a case of Hirschsprung's disease four months after sympathectomy, the results of which were very gratifying. He also presented a patient who, ten years before, had been the victim of a gun-shot wound that shattered the humerus of the right arm. Instead of amputating at that time, which, under the circumstances, seemed to be the logical procedure, a bone-graft was instituted and fortunately resulted in a well-functioning arm.

During the two-day stay in Dublin, inquiry was made as to the means of support of the charity hospitals. It was found that volunteer subscriptions were practically the sole source of financial income for the maintenance of these hospitals until last year when the Irish Sweepstakes came to the rescue. The horse races upon which the Sweepstakes are placed are run in England. Ireland takes care of the betting by the innovation

known as the Sweepstakes. Thirty per cent of the proceeds thus obtained goes to the upkeep of those hospitals that have signified their desire to profit from this source of revenue. The returns are amazingly large; one small hospital in Dublin received \$200,000 as its share for last year alone.

At the Victoria Hospital, Belfast, a splendid paper on the history of therapeutics was given by a professor of bacteriology whose name I do not recall. He commented on the great prevalence of rheumatic fever in the British Isles, stating that one-sixth of the disability among the working class was due to this disease. He praised the Mayo Clinic for its work on the use of stomach tissue extract in the treatment of pernicious anemia. He also gave credit to Dr. Borgen of the Mayo Clinic for his work on ulcerative colitis. It was his belief that Dr. Borgen had directed attention to a form of normal enterococcus capable of becoming virulent, rather than that he had discovered a specific organism always causing this disease. Three cases of ulcerative colitis were presented that had recovered by the use of vaccine. The Besredka method of giving it was used. 1 cc. of the vaccine in 120 cc. of normal saline solution was given by rectum about once a week. They estimated about 100 million organisms to 1 cc. of the vaccine.

While at Belfast, we were given a lecture on the panel system of medical practice. This is a form of medical benefit insurance and provides that every working man with an income of less than \$1,500 a year must belong to the association. It costs him about \$2.25 a year and gives him free medical attention whenever his health demands it. This does not include hospital or surgical care, but only provides for the services of a physician either at his office or at the patient's home. Every person is free to choose his own doctor provided that he is on the panel register—which accepts only physicians in good standing. The insurance does not cover the other members of the household, but considers only the one insured.

The advantages of this insurance as given to us were that: (1) it brings the patient to the doctor at an earlier stage of disease; (2) it gives the doctor an income from a class of patients that otherwise would fail to pay; (3) it makes his practice saleable.

The disadvantages are: (1) It only considers insured persons, their families are not cared for. (2) Only home and office attendance is provided. It does not provide hospital care. On the other hand, most of the patients in this insured class would be eligible for the charity hospitals, so, to

a certain extent, that disadvantage is offset. (3) It sometimes causes physicians to be too hasty and unconcerned about the diagnosis and treatment of their patients. This objection, without reliable statistics, would hardly seem to stand the test of logic. Under the old scheme a large number of the patients now insured would be non-pay cases, and the doctor, realizing this, would be under only a moral obligation to treat them. With the panel system, however, they become contributors to his income, and he finds himself under both a financial and moral obligation to treat them. It seems reasonable to believe that the latter group would receive more careful attention.

We were informed that the panel system had met with severe opposition from a big portion of the medical profession when it was first proposed. It was put into effect, nevertheless, and now it is found to be quite generally acceptable, although its usefulness can undoubtedly be greatly improved upon, so as to serve better the needs of both the patient and the doctor. The lesson, as we saw it, was that the medical profession would be wise indeed if it took the reforming of medical practice into its own hands rather than leave it entirely to the mercy of non-medical organizations. That a new order of things will come seems inevitable. How well we meet it will depend, not upon our resistance to it, which throughout medical history has always failed, but upon our far-vision and co-operation in bringing to light a system which will meet the social and economic demands of the day, giving at the same time an efficiency in the art of healing which will continue to preserve the noblest aspects of our profession.

From Belfast, we went to Glasgow, Scotland, where clinics and lectures were given at the University of Glasgow. Rounds were made with Prof. Monroe, who also presented a case of achondro-plasia. The characteristic feature of this disease is a defective development of the cartilage affecting only the long bones, leaving the skull, pelvis, fingers, and similar bones normal.

Prof. Hunter talked on diseases of the pituitary gland and presented two interesting cases to illustrate his points. The first, a case of acromegaly, showed the results of hyperactivity of the anterior lobes of the pituitary gland. The second was a case resulting from a decreased secretion of the anterior lobe and had all the characteristics of infantilism. By using thyroid gland therapy, 1 grain twice a day, in this case, he felt that the patient's condition had improved greatly. He had

received no encouraging results from pituitary extract.

At Glasgow, we saw the best example of modern hospital construction that we had seen in the British Isles. It was Mearns Kirk Hospital for Crippled Children. It consisted of about six separate buildings arranged in butterfly fashion and containing every convenience necessary for the effective treatment of orthopedic conditions. It was quite a contrast to the ordinary hospital visited which consisted of large wards of thirty or more beds with no single rooms.

At Edinburgh, Scotland's seat of learning, we found many interesting things. Its famous medical school is one of the most widely known in the British Isles and receives students from all parts of the world. We were informed that of all its graduates about 60 per cent are foreigners who return to their native lands to practice. Their system of medical education is briefly as follows:

At about twelve years of age the student decides to become a doctor. He takes five years of preparation in English, French, Latin, Science, and Mathematics. Following this an entrance examination to the medical school must be passed. Five years of medical work is next required which includes hospital training. To engage in public health work demands one more year of post-graduate work, and to practice surgery two years in addition to the regular five are necessary. The fundamental subjects such as anatomy, physiology, and pathology are strongly impressed upon the student from the beginning to the end of his medical work.

During our first day at Edinburgh, Dr. C. D. Comrie gave a splendid paper on "The History of the Edinburgh Medical School." Founded in 1705, this school has had within its walls some of the greatest of professors and has taught many famous physicians. Among its many able teachers must be mentioned the great anatomists, Charles Bell and Robert Knox. It will be remembered that Robert Knox figured in the famous Burke-Hare case. Bodies for dissection were brought to the University by two notorious characters, Burke and Hare, who received the usual financial remuneration for them. An investigation showed that they murdered these victims and sold them to the University for the sake of science and for a living. Although Prof. Knox was innocent of any wrongdoing in the case, public sentiment rose to such a high pitch that he was forced to resign his position as professor of anatomy. His career was ruined and he became a lonely, wandering physician.

John Brown was another famed Edinburgh professor. He advanced the theory that disease was due to one of two things: lack of tissue tone or an excess of tissue tone. His treatment, therefore, was directed either to increasing or decreasing the tonicity of the bodily tissue. His two standard therapeutic weapons were whiskey and opium. Whiskey stimulated; opium depressed. He believed firmly enough to practice on himself what he preached, and so he died from his generous ministrations, proving the correctness of the old adage that he who treats himself has a fool for a physician.

While at Edinburgh, a visit was made to the Pathological Museum of the Royal College of Surgeons. This has one of Europe's outstanding collections of rare pathological specimens. Its wide variety and its many cases, together with the splendid care in handling them, make this a most interesting place to visit. Here was preserved the unusual esophagus of the famous Judge Jefferies of early days. A diverticulum about the size of a golf ball hung from its upper aspect. As the story goes, the Judge's disposition and decisions were influenced to a great extent by the condition of the diverticulum. When filled with food, he was vicious and relentless; when empty, he was more tolerant and just to the victims who came before him. He had a spoon which was regularly employed for emptying the pouch, and which, therefore, became an important instrument in influencing the destinies of the many prisoners who came to be judged.

Before going to the continent, another visit was made to London for the express purpose of seeing the British Museum and that of the Royal College of Surgeons. An attempt to describe the wonders of these two places at this time would meet with failure. I wish however to refer to just a few of the interesting medical things found in the Royal College of Surgeons' Museum. Here is preserved the famous microscope of Sir Ronald Ross which first brought to view the malarial parasite in the mosquito. The original antiseptic spray of Lord Lister is there. With this cumbersome apparatus, there was introduced a new epoch in surgery destined to save millions of surgical patients from the horrors of destructive infections. The collection of rare pathological specimens and monstrosities found in this museum is one of the largest in Europe, and, of course, was well worth seeing. Here is also preserved the 15,000 interesting collections of John Hunter, among which is the skeleton of Charles Byrne, the huge giant, at one time the patient of the great

surgeon and later one of his prized anatomical collections. It is said that the patient, living in constant fear of being claimed after death by Himter, did his best to die unclaimed. His final request was that he be buried at sea so as to escape the clutches of the vigilant surgeon, but by some means or other, his body was recovered. It finally came into the hands of the famous surgeon and now rests within the walls of the Royal College of Surgeons' Museum in London, and has gained a fame which might otherwise have been lost.

At Amsterdam, Holland, we were most pleasantly received by Prof. Otto Lantz who gave a very instructive surgical clinic on goitre. We were informed that in Holland there are few simple goitres, but many cases of Graves' disease. In Switzerland, on the other hand, there are few cases of Graves' disease, but simple goitre is very prevalent. "In fact," said Prof. Lantz, "the one who has no goitre in Switzerland is no Swiss."

The contrast in surgical technique in Holland and in America was worth noting. No masks or caps were worn, and cloth, instead of rubber, gloves were used. There seemed to be far less concern about the details of aseptic surgical technique here than we ordinarily see in our own country. The ability of Prof. Lantz, however, was no ordinary one. The simple, easy, and thorough manner in which he operated showed him to be a master. Having completed a difficult operation, and realizing that all is not won on the operating table, he wisely quoted, "We must not praise the day until it is evening."

Avertin was used as the anesthetic in Prof. Lantz's clinic. It was administered by rectum a few minutes before the operation. The result in the few cases shown was most gratifying. Complete sleep and relaxation were obtained.

While at Amsterdam, we were privileged to visit the neurological clinic of Prof. B. Brouwer. It is recognized as one of the best in Europe. He fashioned it after the American system and had his first assistant spend two years with Harvey Cushing, perfecting himself in brain surgery. He has built as fine a unit as any neurologist could wish for. The clinic provides 118 beds for patients, and has an out-patient attendance of about 1,700. It is equipped with a modern operating room, a complete diagnostic service, and a research laboratory which includes equipment for all kinds of sectioning and detailed examinations of pathological specimens.

Prof. Brouwer gave a very interesting clinic on polyneuritis. He presented four cases of this

disease resulting from the use of apiol, a popular abortive among women in Europe. In his research work on chickens, which he also demonstrated, he proved the paralyzing effect of this compound. Pure apiol, of course, does not produce this result. It was an adulterated product which had been circulated throughout the countries that had brought serious complications to many users. It produced the same paralyzing effects as Jamaica ginger paralysis in America. So far, no cure for the condition had been found.

From Amsterdam, we went to The Hague where Prof. Jan Shoemaker gave splendid surgical clinics on gastric ulcers and fractures. He has a well-deserved international reputation for his work in the field of surgery.

The medical and surgical care given to patients in Holland appeared to be excellent. The Hollander is a slow, careful, methodical and plodding type of individual who provides well for the needy, and, by virtue of his industrious nature, keeps well abreast of modern needs.

In Brussels, Belgium, we were greatly impressed by the Brugman Hospital, an institution of the pavilion type with 1,400 beds. It includes a complete medical, surgical, cancer and physiotherapy service and an extensive out-patient department. While making rounds with Prof. Rene Verhoogen, we were shown a case of exophthalmic goitre and were informed that a very satisfactory treatment of this disease, as practiced here, consisted of the use of insulin and quinine. Ten units of insulin a day for the first week and twenty units a day for the following week were given. Quinine, twenty grains three times a day, was also administered. Prof. Verhoogen maintained that surgery was not required in cases under this treatment. The basis for the use of insulin was that it had an antagonistic effect upon the thyroid.

We were surprised to learn from Prof. Verhoogen that he considered most pleurisies with effusion to be rheumatic in origin. His treatment consisted of large doses of salicylates, ten to fifteen grams a day. They were administered with a few drops of tincture of opium in 250 cc. of water per rectum. He stated that the pleuritic fluid disappeared in a few days. Good results were obtained in 90 per cent of the cases.

The last city to be visited on the trip was Paris. Here we were very kindly received at the American Hospital, which is under the supervision of Dr. Edmund Gros. It is a splendid institution, modern and well equipped in every respect. It is the hospital of choice for Americans

in Paris. It also provides care for many of the French poor who are in need of hospitalization.

While at this institution, we were instructed relative to the use of the oscillometer, an instrument devised to measure the oscillometric movement of the blood in the arteries. Its value consists in the detection of such arterial diseases as Raynaud's disease, thrombosis, sclerosis, and the finding of any abnormality producing partial or complete obstruction of an artery. This instrument is widely used and highly regarded in France, but its use in America, at present, is rather limited. Perhaps it is the difference in price that accounts for this fact. In Paris, the instrument costs \$20.00; in America, \$50.00. A big factor in this increased cost is the high tariff on medical and surgical instruments which amounts to a 60 per cent customs duty.

A very interesting lecture was given at the American Hospital by Dr. Herman of the University of Strassburg on the subject of surgical relief of pain in angina pectoris. He reported gratifying results in this condition by removal of the stellate ganglion. Experiments on dogs had shown that the removal of this ganglion produced no disturbance in the efficiency of the myocardium as determined by various functional tests. Experimental work also brought out the additional interesting fact that fibrillation was produced by interference with the purkinji network and nutrition of the bundle of His. Fibrillation could not be produced by cutting the coronary artery, but when its proximal end was clamped, thereby disturbing its network of nerves, fibrillation did occur.

In the operation for angina pectoris, Dr. Herman stated that at times the intermediate ganglion in place of the stellate was removed and, of course, in those instances no relief was obtained.

A number of the old hospitals in Paris were visited, the most interesting of which was the Hotel Dieu. Weather-beaten, ragged, and seared with a tragic medical history, this institution stands today a survival of many gruesome experiences. In Garrison's History of Medicine is given a description of this hospital as written by Jacobus-Rene Tenon in 1788. At that time, it contained 1,220 beds most of which contained from four to six patients per bed. Even the halls were lined with patients lying miserably on piles of straw. The highly contagious cases were mixed indiscriminately with the non-infected ones. No attempt at isolation was made. Vermin and filth abounded. Recovery from a surgical operation was a rarity. From such a state of af-

fairs to its present condition is indeed a revolutionary change. Although still handicapped by lack of many convenient, modern hospital facilities, it now stands as a clean, safe, and scientific institution for the care of the sick.

A stay in Paris would hardly be complete without a visit to the Pasteur Institute, famed for its many remarkable contributions to science. It is named after its founder, Louis Pasteur, father of bacteriology. One of the first things to attract attention in going through this splendid institution is the modest but beautiful Pasteur Memorial room containing the tombs of both Prof. and Mrs. Pasteur. On the walls are marvelous engravings of the materials with which he worked, such as the grape vine, the rabbit, and the dog. In large letters, on one side of the room, are inscribed the words: Faith, Hope, Charity and Science. Adjoining rooms contain the fermentation flasks and other original laboratory equipment with which the great scientist solved his problems.

The Pasteur Institute contains 120 beds for infectious diseases. Each bed is in an isolated room and every possible precaution is taken to avoid cross-infection. No charges are made for the care of patients. All services are given free. It is a model institution for the study of the infectious diseases.

Perhaps the outstanding man at the Pasteur Institute today is Prof. Calmette, the originator of the B. C. G. vaccine preventive treatment in tuberculosis. He gave very generously of his time in showing us the new building to be used for the continuation of his work with the B. C. G. vaccine. Prof. Calmette is very charming and apparently possesses the qualities of both the gentleman and the scientist. He is more enthusiastic than ever over the possibilities of B. C. G. vaccination, and the work continues to grow throughout France.

Although most of us are yet too conservative to accept fully this method of protecting children from the development of destructive tuberculosis, we are, nevertheless, willing to wait until time points to its absolute value. The Lübeck tragedy can hardly be cited as a discouragement of this method because of the fact that the culture of B. C. G. submitted was proved to be innocuous. Calmette's assistant informed us that failure to follow directions in the use of the vaccine was probably responsible for this disaster. The work of Petroff, however, brings out possibilities that must be seriously considered and satisfactorily

explained before the general application of B. C. G. vaccination can be hoped for.

A review of a medical tour would be incomplete without a statement as to one's impressions of the experiences gained. There can be little doubt but that those people traveling abroad, intent on improving their views on life, return with a definite satisfaction as to money spent. There are values received in travel that cannot be obtained elsewhere and that add materially to one's interest and understanding of life. To the medical man who travels for both professional and pleasure purposes the rewards are correspondingly greater. This type of travel, at least for the first time, covering a limited amount of time is best taken with an organization such as the Inter-State Post-Graduate Medical Association which specializes in the medical interests. It provides access to foreign Universities and introductions to leading physicians that otherwise would be difficult to obtain. It breaks the ground, so to speak, for one who plans on a return visit.

It is difficult to make any trustworthy comparisons as to the general quality of medical work done in Europe and America. Their social and economic conditions are so different from ours that the medical work must of necessity vary. There is no doubt, however, but that our American money, which used to be so plentiful, has given us more luxurious hospitals and more complete equipment than is ordinarily found in Europe.

Their physicians, on the other hand, have learned to carry on with less, and their patients expect far fewer comforts than we have made

available to the average patient in America. The recognized necessary conveniences for the ordinary patient in our country would be considered an extravagant luxury in Europe, and if the American charity patient was subjected to the ordinary hospital care given his European cousin, there would be cries of horror from divers societies and investigating committees. It has long been recognized that American prosperity has produced a higher standard of living, and with it has come a more expensive hospital set-up.

The anti-tuberculosis work as carried on in America is far in advance of that carried on in the European countries which we visited. We have more efficient organizations, better sanatorium facilities, and a more complete program. The matter of lay education in combating tuberculosis is not greatly stressed. Tuberculin testing surveys are not a part of their equipment. Collapse therapy, especially in the British Isles, is used in an ultra-conservative manner. All in all, if our present program for the control of tuberculosis is worth anything, then we can expect far happier results from the work in America than from that in most European countries.

It is impossible to place in a small equation the value of a foreign medical tour. The medical clinics visited, the social contacts made, the sights seen, the history learned, the customs noted, and the impressions gained are all experiences that leave a man better equipped for the art of living. The time and money spent in purposeful travel give values, both broadening and delightful, which few medical men can afford to miss.

## Poliomyelitis

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THE following cases seen during the fall of 1930 are reported:

Case I. A baby nineteen months of age who apparently had been perfectly well, developed, overnight, a paralysis of the right side of the face. This child had played out in a sand box the previous day, during which time a chilly, strong breeze was blowing. Since the neurological examination, aside from the facial paralysis, was negative, the condition was considered to be a

Bell's palsy. When first seen the child's temperature was 99° F, by rectum.

The following day a second child (case II), age eleven months, a member of a different family, was seen which complained of a paralysis of the right side of the face and an inability to move the right leg and thigh. The preceding day this baby had been slightly feverish and restless, and had vomited several times. On examination weakness was noted in the right lower

extremity, and the tendon reflexes were not obtained on this side. In addition a paralysis was present which involved the right side of the face. The left leg and arm seemed to be normal. There was some rigidity, involving the dorsal and lumbar spine especially and the cervical region to only a slight degree. A spinal puncture revealed a clear fluid containing 190 cells, 80 per cent of which was polymorphonuclear leucocytes. A diagnosis of poliomyelitis was made, and 40 c.c. of convalescent serum were given intramuscularly. For six days after this the weakness of the muscles of the right side of the face and of the right thigh remained unchanged, after which improvement gradually took place. At the present time, one year after the onset of the trouble, there is no evidence of any residual weakness either of the face or of the leg.

This second case prompted a further investigation of the first child referred to above. Thus, twenty-four hours after the onset of the facial paralysis, a spinal puncture was performed on case No. 1 which yielded a clear fluid having a cell count of two. Since the neurological findings were normal, aside from the facial involvement, and the spinal fluid was negative, the possibility of the presence of poliomyelitis was considered excluded. Three days later this child began to run a slight fever and to vomit. No further paralysis appeared, however. A second spinal puncture was done and this time the spinal fluid contained 290 cells with the polymorphonuclear leucocytes predominating.

Although no additional neurological signs had appeared, aside from a questionable spinal rigidity, 40 c.c. of convalescent serum together with 30 c.c. of Rosenau's serum were administered. Subsequently the child gradually improved, and in four days the spinal fluid cell-count dropped to 56, with the mononuclear type predominating. At present there is no residual evidence of the facial paralysis which appeared before the spinal fluid showed an increased cell count.

The third case developed in a boy, age five years, who, on the preceding day developed a severe headache associated with considerable nausea and vomiting. Twenty-four hours after the onset of symptoms this child had a temperature of 101° and exhibited more prostration than the temperature seemed to justify. On examination the tendon reflexes were found hyperactive, and the patient complained of pains in the legs. The rigidity of the thoracic spine was rather marked, but the neck could be flexed fairly well. On spinal puncture the fluid was found to be clear, apparently under considerable pressure, and

gave a cell count of 460, the majority of which were polymorphonuclear leucocytes.

A diagnosis of poliomyelitis was made, and since the Minneapolis supply of convalescent serum had been exhausted, he was given 60 c.c. of whole blood intramuscularly, taken from two normal adults. The following forty-eight hours his symptoms and physical findings remained about stationary, and after that showed slight gradual improvement. Five days after the onset of the disease 20 c.c. of convalescent serum were given. The clinical improvement continued, although some rigidity of the spine and shooting pains in the legs persisted until about the sixteenth day of illness. At no time did any definite paralysis appear, although early in the course of the disease the boy complained of difficulty in swallowing. At the present time he is perfectly well.

#### COMMENT

Poliomyelitis is by no means a rare disease, and undoubtedly many abortive cases are overlooked. At the onset the patient usually complains of headache and pains in the extremities, and is nauseated. At this stage of the disease a rigidity of the spine appears which, unlike meningitis, does not involve the cervical as much as the thoracic portion of the spine. The tendon reflexes may be exaggerated, and weakness of muscle groups may be noted. Early in its course, the spinal fluid cell count is moderately high, with the polymorphonuclear cells predominating. A cytotoxicity of these cells soon occurs; thus, in three or four days, mononuclear leucocytes are found to predominate in the spinal fluid.

In this initial and preparalytic stage of infantile paralysis, convalescent serum should be administered. Flexner and Lewis, and Levaditi and Landsteiner demonstrated over twenty years ago that the serum of patients recovering from infantile paralysis is capable of neutralizing the filterable virus which today is generally considered to be the cause of poliomyelitis, and to the present time no therapeutic serum equalling its effectiveness has been discovered. In instances where convalescent serum is not available, whole blood taken from two or more normal adults, and preferably from adult contacts may be given. By using multiple donors there is a high probability of giving blood having power to neutralize the poliomyelitis virus, since, as shown by Aycock and Kramer, the serum of as high as 80 per cent of the adult population in certain communities has this neutralizing property.

## Social Insurance Is Contrary to the Fundamental Principles of Democratic Government

EDWARD H. OCHSNER, M.D.

*Chicago, Ill.*

ALL forms of Social Insurance are contrary to the spirit of democratic government. They destroy individual incentive, initiative and self reliance. They substitute paternalistic control for independence of thought and action. We pride and congratulate ourselves on living under a democratic form of government, but most of us fail to realize that we are slowly but surely drifting away from the true democratic spirit in government—that we are gradually substituting a hybrid form of government, a cross between bureaucracy and socialism. Personally, I am a firm believer in democracy and believe that many of our present ills are the direct result of already having deviated too far from the fundamental principles of democracy.

Individual responsibility is the foundation of democratic government. If a nation does not educate its citizens to individual responsibility, it will soon have no one capable of assuming public responsibility. Slowly through the ages the common man has risen from chattel slavery and serfdom to independence, freedom and personal liberty, and now some well-meaning but misguided people want to undo all this. They want to enslave him again, making him in fact a bondsman of the state. Organized society is forever forging new chains with which to shackle the free development of its members, it is forever meddling with the private affairs of its citizens.

One of the best illustrations of this is found in a recent survey of the Citizens' Bureau of Milwaukee which found that the city of Milwaukee is engaged in approximately three hundred different functions, one-fifth of which have been added during the last sixteen years. Milwaukee is no worse in this respect than many other cities in this country. Add to this the activities of the county, state and federal governments, and we find an explanation of the following: "In a period in which the population of the United States has increased 10 per cent the number of persons holding civil office has increased 40 per cent and the amount paid in salaries has increased 150 per cent." Thirty years ago one person in every forty-five was in government employ, while now one in every twelve is so employed.

"It is a profound mystery why the people of the present generation should so violently run after the things their forefathers so violently ran away from in 1776. One of the chief indictments of King George set forth in the Declaration of Independence reads: 'He has erected a multitude of new offices and sent hither swarms of officers to harass our people and eat out their substance'."

In a recent article, Dr. Harry Emmerson Fosdick makes a statement that seems particularly suitable in this connection. He says, "Many of those in society who are dissatisfied with present conditions know what they want to get away from, but they do not know whether they are going." I would add "nor do they seem to have any clear idea as to what they want." Before we adopt new laws we should make reasonably sure that such laws will not introduce new and greater evils than they are expected to cure, that they can actually be enforced, and that they are not likely to be abused in their administration.

A far-reaching innovation such as Social Insurance must be viewed from many angles. We must consider its effect upon the general public, the insured, the employer, and the medical and dental professions.

If we are deliberately trying to get away from the democratic form of government, having a definite objective in view, and if we are reasonably certain that the goal for which we are headed is worthwhile and is going to result in general social and economic betterment, an experiment with Social Insurance might be justified. But, even then, it would be well to weigh carefully what the wise founders of our Government had to say on this important subject. I quote from the Declaration of Independence, "Prudence, indeed, would dictate that government long established should not be changed for light and transient reasons." If we a nation are just aimlessly drifting, as we seem to be, we are almost sure to get into serious trouble. We believe that we shall be able to show conclusively, in future articles, that in those countries in which it has had prolonged and extensive trial it actually has had serious consequences. These latter problems will be taken up in subsequent articles.

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### MEDICAL SOLIDARITY

In the beginning of things, medical knowledge and practice were vested in the only educated profession of those days—the priesthood.

When, by an edict of the Pope, priests were forbidden to shed blood, specialists arose; the barbers did the bleeding and chemists prepared and dispensed medicines. The members of the barbers guild got along quite well together, but there came a split among the chemists into physicians and apothecaries.

The apothecaries withdrew into a distinct group, satisfied to prepare and merchandise remedies. Physicians absorbed the calling of barber-surgeons, and there came to be a single profession presiding over the healing art, having the combined name and function of physicians and surgeons. For centuries humanity was satisfied to look to this "doctor" in every case of distress and trouble.

About fifty years ago, mitosis and karyokinesis were first taught to medical students, and it is interesting to note that coincident therewith, there arose great divisional activity in the medical profession. So much has been written in jest about the specialist who "knows more and more about less and less" that we shall refrain. There is a more serious side to consider, and that is the further threatened disintegration of an, until recently, quite united profession, into bodies as distinct, if not more so, than those of the chemists and barbers of old; and this is now complicated by the presence of cultists.

Is it any wonder that the cultist often passes

as a specialist among the laity when specialists assiduously teach by word and example that they, too, are "ists" of some kind or other, and even choose to be listed apart from the regular profession in telephone directories? Medical specialists who insist on such classification should bear in mind that cultists might appear in that same classification, which surely would add to a confusion already bewildering and at times, annoying even to general practitioners.

In facing the problems of a rapidly changing civilization, we are confronted by questions of common interest, and we need to have a common front. It is high time, then, that the medical profession takes steps against further erosion and fragmentation—or who can tell where it may end.

In urging this, we have in mind no selfish interest. We would rise above that. We would place our plea upon the higher plane of devotion to a common cause; that which binds us together in service to humanity, now threatened more than ever by political quackery from every side. Let us stand together for mankind's protection, as a united body, with a common designation, in harmonious understanding among ourselves.

A. E. H.

### TRAVEL AND EDUCATION

A European Medical "Exposure" by Dr. Arnold S. Anderson in this issue, demonstrates the invaluable educational factors of travel to the physician. Every physician who has attended medical meetings or visited clinics and hospitals of any importance can testify to the same fact. What prevents a more general attendance at medical meetings and clinics? That modern bugaboo, lack of time, is the answer. But is the lack of time, today, such a barrier to travel as it is thought to be?

In 1827, in Lancaster, Ohio, the use of the schoolhouse was requested for a debate on the practicability of the telegraph and the railroad.

It is said that the board went on record with the statement that they were willing that the schoolhouse should be used for the debate of any reasonable question, but that the subject of man traveling at the frightful rate of fifteen miles per hour could not be considered reasonable. Moreover, if the Lord had intended that this should come to pass, he would have said so in the Scriptures, and since there is no reference to it there, the use of the schoolhouse must be refused for such a debate.

That was over a century ago, but are we not today, still thinking in terms of ten or fifteen years ago? Are not our ideas of distance translated almost entirely in the mileage of automobiles and trains? Nevertheless, one can travel from the Twin Cities to New York in approximately ten hours time, leaving in the morning and arriving in New York City in time to attend a medical meeting the same evening. A physician can travel from coast to coast in twenty-five to thirty hours, and time lost from a busy and thriving practice will probably be more than compensated for, in the value of the meeting attended.

The railroad companies, working with the air lines, have reduced tremendously the travel time between many points in the world. The air lines have reduced their fares so that they are approximately the same as railroad fares plus pullman accommodations, extra fare charges, etc. The time schedules are arranged so as to be most convenient for air passengers. Traveling at an average speed of 120 miles an hour is a great saving of time over our previous modes of travel.

But with the suggestion already having been made that landing ports be constructed at reasonable safe intervals across the Atlantic Ocean and with the development of airplanes with a cruising speed of 250 miles an hour, it seems that the future has still more to offer by way of rapid transportation, advantage of which should be taken in medical education.

J. A. M.

#### CHRONIC APPENDICITIS

In a detailed and carefully considered article on this subject McClure in *Annals of Surgery* of August, 1931, makes some pertinent observations. He cites the fact that there were 17,687 recorded deaths from appendicitis in the United States in 1929 and reproduces Frederick L. Hoffman's chart showing the gradual increase in the percentage death rate from appendicitis in the United States from 1911 to 1928, according to the ex-

perience of the Prudential and the Metropolitan Life Insurance Companies.

This is a startling situation. McClure shares the feeling of many clinicians today, that chronic appendicitis is a questionable entity, but on the other hand our present tendency to disregard it, may have led to overlooking a large class of cases with recurring mild appendicitis with insufficient signs whereon to make a diagnosis until they flare up into acute fulminating form with all its hazards. Undoubtedly the pendulum has swung too far in the wrong direction. If there is no such thing as chronic appendicitis there is at least a tendency for inflammation to return in appendices which have once been attacked and this tendency to recurrence seems to become more certain after a second attack.

The lesson is obvious. Unless more cases can be diagnosed and dealt with surgically in the relatively safe early period the death rate will continue to be unduly high.

GILBERT G. COTTAM, M.D.

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#### JOHN H. FULTON, M.D.

We bow in reverence to the memory of a great physician and teacher as we record the passing of Doctor John H. Fulton, oculist and aurist, in St. Paul, February 1, 1932, at the age of seventy-six, of cancer of the bladder.

He had been active to the last and there was no intimation of his affliction, when, but two weeks before his death, "Uncle John," as he was lovingly called, presided over the regular meeting of the Minnesota State Otolaryngological Society in Minneapolis.

Doctor Fulton was born in York, Pennsylvania. He was educated at the University of Pennsylvania, where he received, not only his medical degree, but a master's degree in the arts and the degree of doctor of philosophy. He practiced for two years in Altoona, Pennsylvania, and then came to St. Paul.

Doctor Fulton and Drs. William Davis and Justus Ohage, Sr., the latter two still living, came to St. Paul about the same time, and records of the Ramsey County Medical Society list them among the oldest St. Paul physicians in point of service.

Doctor Fulton was on the original faculty of the St. Paul Medical College, founded in the early 80's, and about ten years later absorbed by the University of Minnesota medical school. With the merger of the schools he joined the univer-

sity faculty, and at his death was emeritus professor of ophthalmology.

Doctor Fulton was a past president of the Ramsey County and Minnesota Medical Societies, the Minnesota Academy of Medicine, of which he was one of the founders, and the Minnesota Academy of Ophthalmology, and was a member of the American Medical Association and the American Academy of Ophthalmology, as well as of the British organization. He was on the staffs of Miller and St. Lukes hospitals, and for many years was the oculist on the surgical staffs of the Northern Pacific, Great Northern and other Northwest railroads.

#### PAUL HENDRIKSEN, M.D.

Paul Hendriksen, M.D., was born in Stensvaag, Norway, October 7th, 1845, and died at his home in Vienna, S. D., September 17th, 1931, having reached the ripe old age of eighty-five years.

He had been a victim of diabetes for many years, and this, with the accompanying debility of old age, was the cause of his death.

Dr. Hendriksen received the usual public school education in his native country, and at the age of twenty-two years came to Paxton, Illinois, where, after working as a farm hand for a year, he entered the Lutheran College at Paxton, where he spent a year in preparation for work as a medical missionary.

In 1870, in pursuance of this same ambition, he entered Northwestern College at Watertown, Wisconsin, where he remained about a year, then went to Stockholm, Sweden, where he took a three-year course in theology, medicine and modern languages at the Swedish Missionary Academy.

Having completed this course he expected to engage in medical missionary work at Beyrut, Syria. In this, however, he was disappointed, as an insurrection broke out in that region and the young missionaries were advised not to enter the field.

He accordingly returned to America in 1875 and accepted a call as a minister of the Norwegian Lutheran Church in Kansas where he had charge of three missions.

In 1888 he responded to a call from Hamlin County, South Dakota, and acted as pastor for several Lutheran congregations for a number of years.

At that time travel was slow and physicians not so easily accessible as in these later days, and, having a knowledge of medicine, Dr. Hendriksen was often called upon to look after the physical as well as spiritual welfare of his parishioners.

In 1898 he resigned from the ministry and entered Central Medical College, of St. Joseph, Missouri; in 1900, he was graduated with the degree of M.D.

From 1900 until the time of his death he resided at Vienna, South Dakota, where he engaged in the practice of medicine. Besides looking after his farming interests, until about three years ago when his advanced age compelled him to retire from such activities.

Until the past four or five years, when his advanced age impaired his eyesight, and his memory became less keen, Dr. Hendriksen was an unusually studious man. His reading was extensive, his memory exceptionally retentive, and it was a pleasure to engage him in conversation.

He was for many years a very faithful member of the Watertown District Medical Society, of which he was at one time president, and a few years ago was elected an honorary member.

F. H. STALEY, M.D.

#### ALBERT E. FLAGSTAD, M.D.

The untimely death of Dr. Albert E. Flagstad, who passed away on January 26th, brought to a close a most brilliant career. Although only forty years of age, his accomplishments had been such that physicians testify he was destined to reach the loftiest heights in orthopedic surgery.

Dr. Flagstad was for many years assistant to the late Dr. Gillette, founder of the Gillette Hospital for Crippled Children at Phalen Park, St. Paul. Following Dr. Gillette's death, Dr. Flagstad continued to care for hundreds of crippled children there where he donated his services.

Dr. Flagstad was graduated from the University of Minnesota in 1920 and was a member of various medical organizations including the American Medical Association, Hennepin County Medical Society, American College of Surgeons, American Medical Editors and Authors Association, American Orthopedic Society, and a member of the Phi Ro Sigma Fraternity.

He possessed an inquiring mind and indomitable courage which led him to the development of many original methods and instruments for use in the treatment of diseases in his field. The "window procedure" used in connection with spinal fusion operations for the correction of spinal curvatures and which has come into general use, is his development. Cast spreaders, cutters, and other instruments designed by him have been found useful by many other operators.

Our Saviour once said, "I came not to be

ministered unto, but to minister, and to give My life a ransom for many." We believe Dr. Albert Flagstad followed His example. He came like our Saviour, not to be ministered unto but to minister. He was the most thoughtful man concerning others, and the most forgetful man concerning himself we have ever known. While on his bed in the hospital in physical distress he remarked to a friend that the hardest part of his confinement was in thinking of the needs of his patients while he was unable to help them. He gave his life for others, and labored on long after he himself should have been in bed under medical care.

Doctor Flagstad was a physician of souls as well as of bodies. For many years he has taught our Young Men's Bible Class, and had done much personal work among young men. He was a leader in all our religious activities.

After all it is not so much what Dr. Albert did or said that will cause him to live forever in our hearts. It is what he was. It is his beautiful character, so gentle, so thoughtful, so kind and so pure, that stands before us today as it were, in a golden setting. He practiced what he preached. He lived what he believed. He was a Christian seven days in the week. His religion was not a matter of words or forms or creeds—it was a life, a life that grew brighter and brighter unto the perfect day. Such a life can never die. His memory will live in our hearts forever. Many of us desire to be better men and women, more sincere, more loyal to friends in trouble, because we knew him. His weary body rests from its labors, but Albert Flagstad is not dead—his soul goes marching on.

C. O. FLAGSTAD.

## Proceedings Minnesota Academy of Medicine

Meeting of November 11, 1931

THE regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, November 11, 1931. After dinner at 7 o'clock, the meeting was called to order by the President, DR. J. S. GILFILLAN, at 8 o'clock.

There were fifty-five members and two guests present.

Minutes of the October meeting were read by the Secretary and approved.

DR. WILLIAM DAVIS read, for the Necrology Committee, the following memorial to DR. H. J. O'BRIEN, and a motion was carried that this be placed in the permanent record of the Academy and a copy sent to the family of DR. O'BRIEN.

DR. HENRY J. O'BRIEN, 1862-1931.

Joining the Academy in 1906, DR. O'BRIEN was one of the older men both in membership and in age. He was in his seventieth year at the time of his death which occurred on September 16, after an illness of only four days.

Born in the neighboring state of Wisconsin on April 21, 1862, he was brought to Minnesota in his early childhood, and after a general education in both parochial and public schools, he entered the Medical Department of the University of Pennsylvania from which he received the degree of M.D. in 1888, and began at once the practice of his profession.

Most of the limited surgery of that day was in the hands of a few general practitioners, one of whom, in St. Paul, was the late DR. EVERTON J. ABBOTT, with whom DR. O'BRIEN formed an early association. From the experience and instruction gained as DR. ABBOTT'S assistant, he soon developed an aptitude for surgery that in later years warranted his limiting his practice to that branch.

At this day it is not easy to realize the difficulties of those who fitted themselves to become experts in surgery at the time when the development of aseptic technic was adding, in rapid succession, one area of the body after another to the fields for legitimate surgical operation. These men had to learn everything for themselves, for there was no one to teach them. Of this growth of surgery DR. O'BRIEN was a part. He was recognized as belonging to the first rank of surgeons in the locality in which he practiced.

One of his most striking characteristics was his willingness to undertake some of the almost forlorn hopes of surgery. Where operation was the only chance, no matter how slender that chance might be, he was ready to give the patient the benefit of it, regardless of injury to his own surgical reputation by probable failure. This was a part of a generous and unselfish nature which manifested itself in innumerable instances in his private as well as in his professional life. No

deserving person who appealed to him for help of any kind was ever turned away.

DR. O'BRIEN was a delightful companion. To a keen sense of humor and a ready wit was added the ability to describe any happening in a most entertaining way and to make the most of its interesting features. He will be missed sadly from our gatherings.

Your committee recommends that this memoir be included in the records of the Academy and that a copy of it be sent to DR. O'BRIEN'S family.

(Signed) E. M. JONES,  
C. C. CHATTERTON,  
WM. DAVIS, Chairman,  
The Committee.

The scientific program consisted of the following:

DR. EMIL S. GEIST (Minneapolis) presented two patients on whom he had operated for tuberculosis of the tarsus. DR. PETTER, of Glen Lake Sanatorium, by invitation, showed X-ray lantern slides of these before and after operation.

About the middle of the last century Ollier performed and described a block resection of the tarsus in the case of tuberculosis of these bones. Several years ago I did this operation with good results, and have since added two more cases, in my private practice, with three additional cases done at Glen Lake Sanatorium.

The cases I wish to present show perfect results with the type of operative treatment mentioned, while each patient has a different area of the tarsus involved.

Case 1. E. H. This little girl presented involvement of the anterior part of the os calcis and posterior part of the cuboid, at the age of three years. Under routine sanatorium care, plus fixation and heliotherapy for two years, the general condition improved, but bone destruction occurred between the astragalus and scaphoid. Resection through the anterior portion of the os calcis and the astragalus, and through the cuneiforms and cuboid, was performed on October 16, 1929. On January 9, 1930, a brace was applied—the child had been walking in a Böehler cast for about a month. She was discharged August 12, 1930. As you see, her foot is a bit shorter than the unaffected one. She walks well and has a good functioning member, two years following resection.

Case 2. V. M., female, age twenty-three. This patient presented a lameness and soreness over the dorsum of the right foot for one year before definite bone pathology was demonstrable. Finally

an X-ray film revealed an infectious process between the scaphoid and cuneiforms, which was thought to be tuberculous in nature. On April 8, 1930, an Ollier resection was done through the neck of the astragalus and calcaneo-cuboid joint proximally, and through the cuneiforms and the cuboid-metatarsal articulation distally. The distal segment of the foot was drawn up and fastened to the os calcis and astragalus with heavy chromic gut. Six weeks postoperative, a Böehler cast with stirrup was applied and the patient was allowed to walk. The brace was applied in October and the patient was discharged.

As you can see, there is definite shortening of the foot but the function is good.

Case 3. Mr. E. H., male, age fifty-two. A typical Ollier resection was also done here. Healing occurred quite rapidly and the patient has now been ambulant for one year since the operation.

#### DISCUSSION

DR. ARNOLD SCHWYZER (St. Paul): It is a little over thirty years ago since a man came to my office with a foot that was at least twice the size of the normal one. He had tuberculosis of the tarsus. He was eighteen years old at the time. We incised on the side of the foot and scooped out the tarsal bones, leaving only a little of the shell of the bones. Of the astragalus, we removed the head and neck part; the cuboid scaphoid and cuneiform were scooped away, leaving only a partial shell. Iodoform was put in and the skin closed tight after the foot had been somewhat crushed together into a more normal form. There was fine primary healing. After about a year he came in again one day walking with crutches and with a foot swollen up as large as it had been before. I was utterly chagrined when the man came in in this bad shape. The patient, noticing this, said that the foot I had operated on before was the one he was walking on now, and that the trouble was now in the other one. I operated upon this foot in the same way. Two or three years ago he brought his wife to our office for an operation, and he told me he had never had any trouble with his feet in all these years.

These cases show how in tuberculosis of the foot, if the general condition allows it, you can get very gratifying results from conservative surgery in the young.

DR. MOSES BARRON (Minneapolis) read his inaugural thesis entitled "The Importance of Hepatomegaly and Splenomegaly in Differential Diagnosis." Lantern slide charts were shown.

#### DISCUSSION

DR. S. MARX WHITE (Minneapolis): This paper ought not to go without some discussion, because, with an enormous amount of work and detail, DR. BARRON has taken a great deal of dead material and made it into a

living study for physicians. I don't know of any other study like it. I think it is not necessary to comment on his conclusions. He has brought out and made clear the limited character of the material. In this climate and latitude many of the diseases causing hepatic and splenic disorders are rare and consequently are not present in representative amount. Within the limitations of the material, therefore, this analysis is useful to the clinician in the terminal stages of the disorders he has analyzed.

DR. R. E. SCAMMON (Minneapolis): I wonder if, on behalf of those who are interested in the study of quantitative anatomy, I may express my appreciation of this paper. Those of us who are engaged in this kind of work have always felt the need of a study of this kind on borderline cases made by one with clinical experience.

DR. BARRON has spoken of the effect of blood content.

So far as I know, the only work in this line was done a good many years ago by Sappy, who tied off the veins and arteries of the liver immediately after death and found that the liver weights thus obtained were about 200 grams above his controls, an increase of about one-seventh or one-eighth in the weight of the organ. So far as I know, no one has determined experimentally how much blood there is in the average spleen at autopsy. DR. BARRON'S work indicates that the changes in spleen weight that may be produced by pressure of neoplasms on the splenic vessels is considerable.

I was very much impressed by the effect of subacute endocarditis on the weight of the spleen. For some years, in gathering supposedly normal spleen-weights in children, we watched the records carefully for references to heart disease, and threw out all spleen cases with heart disease. Apparently, from DR. BARRON'S work, we were justified in this procedure. It is interesting that DR. BARRON did not get any of these extreme splenic weights in gastroenteritis. I have always questioned the work of Stricker on this subject.

I was also very much interested in the weights DR. BARRON obtained in cases of accidental death. I wonder if we must revise our concepts of the normal weights of most viscera in much the same way as we have those of the thymus. Up to a few years ago we were describing hypertrophied thymi as occurring in cases of sudden death, and it was not until Hammar's work on cases of sudden death of known cause that we discovered our concepts of the weight of this organ were really based upon cases in which hunger atrophy had occurred.

Contributions of this kind will enable us to establish an adequate metric description of the human body.

DR. C. B. WRIGHT (Minneapolis): I want to congratulate DR. BARRON on this careful paper which bears out our impressions and conforms to the literature on this subject; namely, that malignant livers become very large before death, and that leukemia is the common cause of large spleens. There are, however, many conditions, such as cyst and cirrhosis which do produce large livers. Rolleston reports a cirrhotic liver that weighed 7,000 grams in an alcoholic. The condition that DR. BARRON describes are end results of disease.

From the clinical standpoint our greatest concern is the early recognition of conditions of this kind. The difficulties in the early recognition of enlarging livers and spleens are many, such as thick abdominal walls, ascites, muscle rigidity, etc. However, this does not detract from the interest of the paper pathologically.

DR. BARRON (in closing): I wish to thank those of you who have so kindly discussed this paper. DR. SCAMMON'S remarks were especially interesting, and they make me feel all the more the value of the study which I am now pursuing.

In regard to the question about the spleen in goiter, it is possible that one or two cases were encountered with large spleens but because of the rarity of the condition they may have been placed under the miscellaneous group. In the study now in progress there is a special group under goiter, and this will probably bring out the variations in the size of the spleens. With reference to DR. WRIGHT'S remarks, what I said in the beginning of my paper bears very pointedly on this subject. In the present study I have excluded all the questionable sizes and those that are just barely palpable. Most of the discussion centered on the definite hepatomegalies and splenomegalies in which the livers weighed over 4,000 grams and the spleens over 600 grams. As you noticed, the organs that fell below these figures might be encountered under a large variety of conditions.

DR. A. E. WILCOX (Minneapolis) reported three cases of acute abdomen complicating pregnancy, as follows:

Abdominal operative procedures during pregnancy generally are looked upon with great misgivings and considerable concern. However, there are certain definite emergencies complicating pregnancy which demand surgical intervention. Such surgical conditions may be classified as follows:

- (a) The acute abdominal conditions.
- (b) Pathological processes which later in pregnancy may interfere with labor, such as ovarian cysts.
- (c) Pathological conditions which if allowed to progress, awaiting delivery, become unmanageable or threaten life, such as acute inflammatory processes.

The following three cases which are here reported come under the first class; namely, the acute abdomen. All were of extreme gravity and of a dramatic nature, requiring immediate operative treatment, and followed by as gratifying and successful results as could be expected in parallel cases occurring in the non-pregnant woman. When an "acute abdomen" develops during pregnancy a critical period is present. Loss of time in needless methods of investigation may be the deciding factor in mortality. I do not believe that too much stress should be laid upon the de-

sirability of detailed diagnosis. The fact that an acute abdominal condition is present is sufficient. A tragedy has occurred which needs immediate and experienced attention. The general practitioner when confronted by such conditions need not feel humiliated by not carrying the diagnosis further. When surgical consultation and interference is sought—and this should be as soon as possible—the combined conscientious effort should be to attempt to arrive at as correct a diagnosis as possible. Yet, even under the most favorable conditions, the acute abdomen will too frequently continue to remain a mystery until the peritoneal cavity is explored.

Case 1. Mrs. M., aged 27, seven and one-half months pregnant. About one month before admission, the patient had experienced some pain, rather severe in character, in the left lower quadrant of the abdomen. The pain was "shooting" in character and referred to the left shoulder. There was nausea, but no vomiting. Upon the day of admission she had been seized with severe pain in the lower mid-abdominal region, "cutting" in character, radiating to the left shoulder. Hypodermics of morphine failed to relieve the pain. Her doctor viewed her condition as one of acute abdomen.

Upon admission to Eitel Hospital, January 30, 1930, her temperature was 98°, pulse 72, blood pressure 118/78, respiration 18, and leucocyte count 16,800. The abdomen was enlarged compatible with a seven and one-half months' pregnancy; there was extreme tenderness on the left side, and marked rigidity elicited by palpation. Previous history and other physical examination was negative. A provisional diagnosis of acute abdomen was made, and while obstruction of the bowel was considered, no detailed definite diagnosis was ventured.

A left rectus incision was made. No free fluid was present in the abdomen. The uterus was smooth and enlarged nearly to term. There were two small fibroids on the posterior wall of the uterus. Adnexae were normal. The omentum and mesentery of the bowel, small and large, as well as the epiploic appendages, showed white tubercles suggesting grossly either tuberculosis or fat necrosis. In the left epigastrium a mass about the size of a large lemon was felt which subsequently appeared to be the base of a volvulus or mesenteric thickening and the mesentery at this point was edematous. The first appearance of the small bowel was that of collapsed bowel, but on further evisceration the upper portions of the jejunum were dilated and cyanosed. This

was followed down to the mass above mentioned and when the mesentery was untwisted, the color immediately returned in the bowel. No other pathology was found. The wound was closed with plain catgut, reinforced with chromic, interrupted and continuous in the fascia, silkworm close together and dermal for the skin. Post-operative diagnosis was volvulus of the jejunum complicating pregnancy.

Recovery was complicated by some nausea, inability to void, and the inevitable "gas pains." However, there was no alarming rise in temperature, or irregularity of pulse and respiration. Fifteen days after the operation the patient went into labor and was delivered by forceps without laceration. The child, a six-pound girl, lived and the mother made an uneventful recovery.

Case 2. The following case presented an acute abdominal emergency immediately following labor.

Mrs. D., age 24, whose present complaints were abdominal distention, abdominal pain, weakness, vomiting, and inability to urinate. Labor pains began Friday, March 21st, about 8 P. M. The pains were not severe. The membranes had ruptured two days before. The patient says she did not pass her urine Friday night after the pains began. About 11 P. M. Friday she was sick to her stomach and vomited, then went back to bed and was awakened at 2:30 by sharp pains. She thinks that at 3 A. M. the pains got much worse and she says she felt as though something broke. The doctor arrived at 3:30 A. M. The baby was delivered at 4:30 A. M., weight, seven pounds, normal, no instruments used. The placenta came normally, and there was normal flow. She says she had no pain after delivery. About 8 A. M. she started to vomit. She could not even keep water down. There was no blood at first. The doctor came at 2 P. M. because of abdominal distention and continued bloody vomiting. She had not voided, but the bowels had moved. The doctor then catheterized the patient and 350 cc. of bloody urine was obtained. The patient stated she noticed her heart pounding and distention of the abdomen was increasing rapidly.

Upon admission to the hospital the patient was slightly cyanosed, blood pressure 130/78, pulse 140, temperature 100.9°, respiration 28. Examination of the abdomen revealed fullness in the left lower lumbar region. It was difficult to make a fluid wave, there was no spasm or rigidity, and no vaginal bleeding. The patient was catheterized and 400 cc. of dark brown reddish urine obtained and, upon pressure below the ribs and in

the lumbar region, an additional 250 cc. of the same colored urine was obtained per catheter. Microscopic examination showed blood cells and many crenated cells.

The presence of the blood in the urine obtained by a catheter, the abdominal distention, rapid pulse, and the expression of additional urine by pressure upon the abdomen suggested an injury in the genitourinary tract and a tentative diagnosis of ruptured bladder was made.

The abdomen was opened and free bloody fluid escaped. The uterus was well contracted and free of adhesions. The bladder was drawn up and on its superior lateral surface a rent was found about two inches long. Examination of the bladder mucosa and walls was apparently normal. The bladder mucosa was repaired with plain catgut and reinforced with a layer of Dulox and several individual sutures to take off the strain. The wound was drained with two Penrose drains going down either side of the uterus. The wound was then closed with tier sutures and reinforced with silkworm. A mushroom retention catheter was inserted in the urethra. The pulse average was 167, fairly good quality, and irregular. Post-operative diagnosis was rupture of the urinary bladder.

Her convalescence, while somewhat stormy, was progressive, with complete recovery. On March 23rd she developed severe herpes of the mouth, but otherwise made an uneventful recovery, leaving the hospital on the 20th post-operative day. The patient has remained well to date.

Case 3. Mrs. K., age 37, mother of three normal children, and deliveries normal. She complained of pain in the abdomen, rapid enlargement of the abdomen, pregnancy, shortness of breath, and inability to lie down.

The patient thinks she is seven and one-half months pregnant and about two weeks ago she noticed very rapid increase in the size of the abdomen. During that time she had had some pain, but during the last night very severe pain started, especially on the right side. This radiated to the back and her abdomen became so tense and sore that she could not touch it, and was unable to lie down because of the severe pain and dyspnea.

Upon admission her temperature was 98.6°, pulse 120, w.b.c. 10,000, urine negative, no nausea or vomiting, and her bowels moved normally. There had been no urinary disturbance in her past pregnancies. The abdomen was enormously enlarged, extended from

the symphysis to the costal margin with almost board-like rigidity. On touching the abdomen lightly the patient complained of severe pain. Ballottement indicated fluid present, which was encysted and under great tension. No fetal heart tones were heard. The patient states that she thought she felt movements of the baby during the last two weeks, but not as active as before that time.

Irrespective of the pain the patient has had previously, the sudden onset of the pain before admission, and the enlargement of the abdomen suggested a rapidly growing ovarian cyst and, on account of the severe pain, probably a twisted pedicle. Ruptured uterus and acute hydramnios were also considered.

The patient was given a spinal injection of 200 milligrams of novocaine. A right rectus incision was made. When the peritoneum was exposed, there was a definite blue color beneath which indicated blood present. In cutting through the peritoneum, the peritoneal cavity was filled with blood and clots. The peritoneum was very thick. All the blood was removed. The uterus was enormously enlarged, filling the entire abdominal cavity. Inasmuch as the source of bleeding could not be discovered, as the uterus was firmly fixed within the abdomen, it was decided, with the consent of the family, to do a Cesarean section. The uterus was rapidly opened. Its walls were extremely thick, and when opened, clear hydramiotic fluid spurted forth, having been under great pressure. It is estimated that three gallons escaped. The child was rapidly delivered, but found to be dead, a monstrosity with anencephalus and spina bifida. The placenta was delivered intact and 1 cc. of pituitrin was given directly into the uterus by hypodermic. I was then able to pull the uterus directly forward out of the abdomen and found a rupture on the right posterior area, below the attachment of the right tube. Some of the blood vessels in this area were the size of a little finger and bleeding was profuse. The walls of the uterus were closed with three layers of suture. There was another very weak spot on the left posterior surface of the uterus and this was sutured with chronic catgut. During these manipulations, the uterus relaxed considerably and 1 cc. of ergot was given. Some additional large blood clots were found beneath the liver and these were removed and the abdomen closed without drainage.

Post-operative diagnoses: Hemoperitoneum, Cesarean section, ruptured uterus, and monstrosity.

The pathological report of the monstrosity was anencephalia, craniorachischisis, meningo-myelocoele, pulmonary atelectasia, prematurity, absence of spinal cord.

This mother made the most uneventful recovery of the three cases. Her highest post-operative temperature was 102.2° on the fourth day. It rapidly returned to normal and continued within normal range. The patient left the hospital on the fourteenth post-operative day and has remained well without complaint to date.

#### DISCUSSION

DR. A. C. STRACHAUER (Minneapolis): The diagnosis and treatment of the acute abdomen in pregnancy is the same as in the non-pregnant woman. The literature on the subject always emphasizes the importance of gentle manipulation at the time of operation. This is, of course, always important in the non-pregnant as well as in the pregnant patient. The most common acute condition of the abdomen complicating pregnancy is appendicitis. I personally have operated upon seven such cases. I recall two of these cases at the University Hospital, in which the appendix had ruptured, and in both cases the peritoneal infection was general. DR. LITZENBERG will recall them. Both of these recovered, as did the five cases, without rupture, and without any miscarriages obtaining. We should have no hesitancy in operating upon any emergency surgical condition complicating pregnancy. Miscarriage is not likely and has not occurred in a single instance in my personal experience, which includes two cases of myomectomy, one of volvulus, and one of nephrectomy for an acute suppurative condition of the kidney. In conclusion then, the pregnant woman should be treated the same as the non-pregnant, and miscarriage is a very unlikely occurrence.

DR. A. T. MANN (Minneapolis): I think we all have had quite a number of cases of acute abdomen in pregnant women. It is quite remarkable how well they stand operations and how rarely they miscarry.

Of the many interesting cases there is one in which the uterus formed the anterior wall of a deep abscess. This was an acute appendicitis, and with an abscess outside of the appendix. The anterior wall was the uterus and the posterior wall the sacrum. The patient was six months pregnant. I opened the abdomen and left a drain in between the uterus and the sacrum. She had a normal child later at full term. Here was a case in which there was actual infection onto the wall of the uterus itself and nothing but a drainage tube between the uterus and the upper part of the sacrum.

DR. J. C. LITZENBERG (Minneapolis): These three cases presented by a general surgeon and discussed so far by general surgeons might give you the idea that any man will operate in these cases. But as an obstetric

consultant, I have been surprised at the number of men who, because of pregnancy, hesitate to open the abdomen in such acute conditions. Wherever there is an acute surgical condition or one dangerous to the patient, the pregnancy should be ignored. Usually the pregnancy is not interrupted by the operation. I think we may approach these cases with surgical judgment and without obstetrical fear.

DR. ARNOLD SCHWYZER (St. Paul): I think these three cases are unusual cases and very pretty ones. The first case where a simple free torsion of the mesentery caused obstruction is a very unusual one, though I have seen one such case. As DR. STRACHAUER says, the most frequent cause of acute abdomen in pregnancy is probably appendicitis. I remember two cases of gangrenous appendix in pregnancy. Labor started and they both died. Thus I greatly fear the combination of pregnancy with acute appendicitis.

DR. WILCOX's second case, rupture of the bladder in an otherwise normal labor case, is most unusual as it seems there had not yet been much labor pain, if I understood him rightly. I wonder if there was some peculiar weakness in the bladder wall. I have seen one case of rupture of the urinary bladder where 6,000 cc. of urine were taken away from the bladder; but that was in a case of retroflexed pregnant uterus. That woman came to the hospital with peritonitis from perforation of the bladder due to distention ulcers. She died.

DR. WILCOX's third case, rupture of the uterus, of course occurs, but here was a non-ruptured hydramnios, and, if I understood the case correctly, there was apparently no severe labor pain.

I think, outside of acute appendicitis, the thing which is of comparatively most frequent occurrence is an ovarian tumor with twisted pedicle. When the uterus rapidly descends into the pelvis after delivery, the ovarian tumor follows and sometimes becomes rotated. I have seen this condition, and we have diagnosed it beforehand.

DR. WILCOX (in closing): In case 2, the history showed that this woman did not remember passing urine during the evening prior to delivery. She stated that about one and one-half hours before delivery her pain became very severe and she felt that "something broke," then the pain was much relieved. The probable and most plausible explanation of the injury to the bladder, in the absence of pathology therein, is that excessive pressure on a distended bladder during labor caused the laceration described.

DR. F. F. CALLAHAN (Pokegama) reported the following case of tuberculosis of the trachea, and showed specimen removed at autopsy.

Mrs. H. B., married, age thirty-one, was admitted to Pokegama Sanatorium on August 31, 1931. Her occupation had been that of

housewife for the past three years, and she had been a linotype operator for seven years previous to her marriage. She worked in an office with a boy who later developed tuberculosis and died. The family history is negative. She had measles and mumps in childhood, typhoid fever at twenty-one years of age, and tonsillectomy under local two years ago.

The first symptoms of her present illness were cough and loss of weight which began in the fall of 1929. She consulted a physician in the spring of 1930 who thought the cough was due to heart disease. A diagnosis of tuberculosis was made in April, 1930. She spent two months in bed in New Mexico, returning to Minnesota by car and has been in bed ever since. She has been short of breath for nearly a year and has had acute attacks of dyspnea since May, 1931. She developed bilateral cervical adenitis in the spring of 1931.

Physical examination showed evidence of parenchymal infiltration in the right side with a chronic pleurisy and probably a small effusion on the left side. The sputum was positive for tubercle bacilli. The blood examination was negative except for a low hemoglobin, 51 per cent (Sahli). The urine showed pus cells at two examinations. The Wassermann was negative at two examinations.

Her temperature ran from 100° to 102° most of the time; pulse 100 to 112. The patient always had difficulty in raising sputum and felt as if there was something in her trachea that she could not get out. A bronchoscopic examination was performed on September 17th, 1931. This showed a shaggy exudate lining the entire trachea and extending into the main bronchi. Some of this exudate was removed and microscopic examination showed tubercle bacilli. The patient felt better for two weeks after the bronchoscopy and then began to have very severe attacks of coughing and dyspnea. She was considered too ill to be bronchoscoped again, and on October 11, a tracheotomy was done by DR. GARDINER. The patient died during the operation.

Permission was obtained for a partial post-mortem which was done after the body had been embalmed. The left pleural cavity was adherent over the base and there were many small adhesions over the remainder of the left lung. There were a few pleural adhesions

on the right side. The heart and pericardial sac were negative. The abdominal cavity was negative. There was a small ovarian cyst on the left side. The right lung showed many areas of caseo-fibrous tuberculosis. The left lung showed very few parenchymal tubercles. The lung was small and covered with a thick pleura. The entire trachea and large bronchi in the right lung were lined with an organized exudate. The tracheal rings seemed to be greatly weakened and the trachea was easily compressed. The exudate extended about 2 m.m. past the bifurcation into the left main bronchus. The remainder of the left bronchial tree was negative. There were two slightly enlarged lymph nodes in the hilum.

The report on the microscopic sections of the trachea was tuberculosis involving the wall of the trachea including the cartilagenous rings.

The meeting adjourned.

R. T. LAVAKE, M.D., Secretary.

#### CASS COUNTY MEDICAL SOCIETY MEETING

The regular monthly meeting of the Cass County Medical Society was held in Fargo, North Dakota, on the afternoon and evening of January 25. Inasmuch as the Board of Editors of The Journal-Lancet was holding one of its regular meetings in Fargo, some of the members of the board were invited to present papers before the Medical Society meeting.

During the afternoon Dr. C. A. Stewart, Minneapolis, presented the subject of "Resolving Parenchymal Tuberculosis of First Infection in Infancy." His paper was largely based on observations made at the Lymanhurst School for Tuberculous Children in Minneapolis during the past decade. Dr. E. L. Tuohy, Duluth, presented a paper under the title of "Chronic Non-Tuberculous Lung Lesions." He exhibited a splendid collection of x-ray films showing points of differentiation between the various diseases. The last paper at the afternoon session was by Dr. S. Marx White. His paper was "Ground Work for Medical Service." Dr. White discussed various phases of medical education in a most excellent manner.

A banquet meeting was held at the Commercial Club at 6:15. In spite of inclement weather the attendance was splendid. Immediately following the banquet, Dr. James M. Hayes, Minneapolis, presented a paper on "Treatment of Acute Empyema of the Gall Bladder," and Dr. W. A. Fansler, Minneapolis, read a paper on "Cancer of the Rectum." Both of these papers were discussed by a number of the physicians present.

## LIGHT AND VISION

Scientific lighting by increasing efficiency and usefulness adds comfort and pleasure to life.

The question is often asked: Are human eyes becoming more defective or does this only seem to be the case because the eyes of all school children, as well as adults, are now more carefully checked as to vision? The fact is that never before has so much been imposed upon eyes as in this swift, intense, modern life. It is only recently that inexpensive, controllable, artificial light has been universally available. Much defective vision is corrigible by the use of medical and surgical science and by the proper adjustment of lenses, and much injury to vision is preventable through scientific lighting. Sight has been called a partnership between light and a seeing organ; there is much in common between the oculist and the electrician.

In eye testing, intensity of illumination over thirty-foot candles is not increasingly beneficial. Man comes indoors to build artificial lighting of his own, and we must consider that in diversified work the eyes need more nearly the lighting environment of out-door life in order that ocular strain, which is the all-important matter in the conservation of eye-sight, may be minimized.

Eye strain has no absolute unit of measurement because it is complicated by the same external condition—by physiological and psychological factors. Convergence and accommodation adjust the eyes singly and together for any given point, and a variation of the distance of any object from the eye requires a change in both convergence and accommodation. This fact is accountable for much eye fatigue, especially when, as often occurs, there is some imbalance between the two functions, accommodation and convergence.

The pupil requires only as many seconds to close to its minimum diameter as it does minutes to open to its maximum diameter. When a worker must observe different surfaces, if the eye rests less than a second upon each surface, respectively, the pupil remains about the minimum size. As the eye rests longer on each surface the pupil's size increases, and as the brightness of the object increases, the diameter of the pupil decreases, and the brightness of the retinal image diminishes in proportion to the area of the pupil. Thus it is easily seen that glare, which reduces the size of the pupil, decreases the amount of light that can be utilized in seeing. Of course, a decrease in the size of the pupil increases definition of the retinal image. Visual acuity remains practically the same with pupillary variance.

Concurrent with the high speed of this age, light intensity has been much increased in general indoor lighting. Modern artificial light is controlled as to quality, quantity, distribution, diffusion, and direction. Increased intensity means increased visual acuity and increased speed, but, unless the increased glare coincident with intensity used is subdued, harm results.

A person working in a room with high-intensity lighting soon becomes nervous and tired, and, unless the glare is controlled, the eyes pain him. Actual pain of

the eyes associated with glare and intensity of light does not come from the retina, because in the retina there are no sensory nerves. Sensory nerves are in a portion of the middle coats of the eye, that is, in the ciliary body and the iris, which are both plentifully supplied with sensation. The iris is responsible for most of the pain.

To best minimize shadows we require light from four angles. In a room with one light we are dependent upon the ceiling and walls for reflected light to get light from four points. Even when light passes through an absorbing glass, highly polished surfaces produce some glare and spectacular shadows, and such surfaces are, therefore, objectionable.

One large light is preferable to four small ones of equal wattage; that is, four twenty-five-watt bulbs will consume one hundred watts of energy, but will not render the light intensity that one one-hundred-watt bulb will. The larger the lamp the more efficient is the rendering lumen output per watt. Small bulbs from ten to fifty watts are often used without any absorbing glass fixture, and they are now frosted inside to promote diffusion and reduction of glare. The absorption factor of these frosted bulbs is small. Reading lamps, with fixtures completely surrounding the light bulbs, are most desirable. Overhead illumination in addition to a reading lamp is also desirable.

Nature intended light to come from overhead. For the best lighting effects all light should be elevated at least ten feet from the floor. The wattage of the commercial fixture should not be less than two watts per square foot of area. Walls and ceilings done in flat white are best, as they give an efficiency of about eighty per cent. Bright finishing of walls and ceilings gives off sheen and reflected glare which is annoying to vision.

Now it happens that photophobia often occurs in persons from causes within the individual. Lighting and short circuit strokes may produce mild symptoms or may result in more serious troubles such as cataracts, retinitis and scotoma, which often result in blindness. Every one has heard of the blindness that may result from too much light falling directly in the eye, as exemplified by observation of the sun eclipse, by desert travel and such things.

If near ultra-violet and near infra-red were harmful to the eye, certain troubles would be prevalent among outdoor workers, which do not prevail. There has been great to do in recent years concerning protective glasses. While it is a safe course to exclude all radiations from the eye which do not cause luminous sensation, yet one can hardly say this is necessary. So-called protective glasses are often no more ultra-violet ray absorbing than ordinary glass. All occupations in which great quantities of ultra-violet radiations are encountered require special glasses which are opaque to the harmful radiations.

Until public education makes high-light intensities acceptable only when glare is eliminated, the oculist must provide for the elimination of glare by prescribing absorptive lenses.

C. DA. WRIGHT.

## NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Dr. R. H. Wilson, Winona, has been appointed county physician to succeed the late Dr. C. H. McDonnell of that city.

Dr. and Mrs. C. W. Mayo and Dr. J. U. Fauster, of Rochester, are off on a six weeks' cruise to the West Indies.

Dr. C. F. Morsman, Hot Springs, S. D., has been elected a member of the Radiological Society of North America.

Dr. T. W. Buckingham, Bismarck, N. D., has moved to Aberdeen, S. D., and becomes a member of the Aberdeen Clinic.

Dr. Alfred C. Dogge, a pioneer physician of Polson, Mont., died at his home on January 26th, following a stroke of paralysis.

Dr. E. W. Lippman, a recent graduate of the University of Minnesota, has opened offices for general practice at Hutchinson, Minn.

Dr. H. E. Neilson, Minneapolis, has been named successor to the late Dr. A. E. Flagstad, as deputy coroner of Hennepin County.

At the annual meeting of the St. James Hospital, Butte, Mont., Dr. R. C. Monahan, was elected chief of staff, and Dr. W. A. Reichle, secretary.

Dr. E. L. Claydon, Red Wing, Minn., who has been absent in Russia, on a six weeks' vacation, has arrived home and again resumed practice at the Clinic.

Dr. James Chapple, one of Billings, Mont., prominent physicians, died of heart failure while en route in calling on his patients in that city on January 30th.

Dr. L. J. Alger, McClusky, N. D., has sold his practice and will spend a year in Europe, where he will take a post graduate course in the study of eye, ear and nose work.

Dr. S. A. Slater, Worthington, Minn., was named one of the vice-presidents of the Sioux Valley Medical Society at the meeting held at Sioux City on January 26th.

Dr. R. J. Critchfield, who has been in active

practice at Fessenden, N. D., for many years, is now located at Fargo, having purchased the practice of Dr. W. M. Hotchkiss.

At the January meeting of the Medical Society held at Milbank, S. D., Dr. A. E. Davis, Rochester, and Dr. J. B. Gregg, Sioux Falls, were the guest speakers of the evening.

Dr. G. I. Badeaux has been named chief of staff of the St. Joseph Hospital at Brainerd, with Dr. B. W. Kelly, Aitkin, as vice chief and Dr. A. B. Rosenfield, Pequot, secretary.

The Upper Mississippi Medical Society held their annual meeting at Brainerd last month, with Drs. J. K. Anderson, Minneapolis, and F. G. Hedenstrom, St. Paul, as guest speakers.

Dr. J. Newton Alexander, a well known physician of Roundup, Mont., was suddenly stricken with an attack of heart trouble, and died instantly while attending a private dancing party in his home city.

Dr. H. P. Johnson, Fairmont, Minn., who has been in active practice in that city during the past 53 years, has the record of bringing over 3,000 babies into the world. In one day he had charge of six births.

The Powell Hospital at Sisseton, S. D., which has been closed for several years, has been reopened under the name of Sisseton Hospital, having been completely renovated and new equipment installed.

Dr. J. A. Freeborn, one of the leading physicians of Fergus Falls, where he has been in active practice for over 36 years, died January 25th at the Mayo Hospital, Rochester, after an illness of only a few weeks.

Dr. J. C. Litzenberg, Minneapolis, will appear as one of 24 lecturers chosen from throughout the United States to appear before the forty-eighth annual convention in Memphis, Tenn., at the Mid-south Post Graduate Medical Assembly this month.

At the annual meeting of the Sheyenne Valley Medical Society, held last month at Valley City, N. D., the following officers were elected: Dr. C. J. Meredith, Valley City, president; Dr. Wm. Campbell, Valley City, vice-president, and Dr. Will H. Moore, Valley City, secretary.

Dr. Kellogg Speed, Chicago, was the guest speaker at the annual dinner of the Minneapolis Surgical Society this month. He discussed latest developments in the treatment of hip fractures. Earlier in the day he addressed a meeting of

specialists in the anatomy amphitheater at the University of Minnesota.

Dr. M. J. Robertson, graduate of the University of Minnesota Medical School, 1930, recently completed his year's internship at the Detroit Receiving Hospital, Detroit, Mich., and has purchased the practice of the late Dr. Merteus, Bayfield, Wis. Dr. Robertson is the son of Dr. J. B. Robertson, Cottonwood, Minn.

The regular monthly meeting of the members of the Sioux Falls Medical Society was held on February 9th, with two guest speakers being on the program. Dr. M. S. Henderson, of the Mayo Clinic, presented a paper on "Management of Fractures," and Mr. Ira A. Moore, a paper on "From the Outside, Looking In."

Financial aid totaling \$400,000 was extended to 14 county tuberculosis sanitoriums by the Minnesota Board of Control during 1931. The state allowed \$5 a week for each free patient admitted by the institution. A total of 1,730 patients received treatment. The tuberculosis death rate in the state has decreased 50 per cent in the last 15 years.

At the annual meeting of the members of the Mitchell, S. D., Medical Society, the following officers were elected: Dr. J. F. Malloy, president; Dr. D. R. Mabee, vice-president; Dr. R. T. Rohwer, secretary and treasurer. Dr. W. R. Ball and Dr. C. S. Bobb were chosen as delegates. Their alternates are Drs. F. D. Gillis and O. J. Mabee.

Dr. Albert E. Flagstad, 40, deputy coroner of Hennepin County, a rising young orthopedic surgeon, died of pneumonia January 26th in Midway Hospital. Dr. Flagstad was born in Minneapolis, and he was graduated from the medical school of the University of Minnesota in 1920, and was a member of the County and State Societies and American Medical Associations.

E. P. Lyon, dean of the medical school, and Dr. C. E. Remy, head of the Minneapolis General Hospital, will represent the University of Minnesota when the Council on Medical Education of the American Medical Association meets in Chicago February 15. Dean Lyon will speak on "Some Phases of Nursing Education," and Dr. Remy on "New Ideals in Fellowship Service."

At the Swedish Hospital, Minneapolis, every Friday morning at 10 A. M. there is conducted a Clinical Pathological Conference demonstrating to the staff and any visiting doctors who care to attend, interesting cases and material that may

be on hand or that have accumulated during the week. Autopsy findings, tissue reports and roentgenograms are exhibited in connection with the various cases presented and this popular three-quarter hour is always well attended.

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters). Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month of March will be as follows: March 2nd—Personal Hygiene—Fresh Air and Sunshine; March 9th—Cleft Lip and Palate; March 16th—Prevention of Bronchiectasis; March 23rd—Fractures of the Spine; March 30th—How Does Cancer Begin?

Another step in the creation of a centralized medical science group on the campus of the University of Minnesota will be completed next fall with the opening of the new school of dentistry building, now under construction. The new building, in the center of the present group, is located between Millard Hall and the Anatomy building, with access to Washington Avenue. Addition of the recently completed hospital wing at a cost of \$835,000; erection of a nurses' home during the present year at an estimated cost of \$400,000, and the construction of the dentistry building at an approximate cost of \$457,000, are the three latest steps in creating a medical center.

Frederick I. Sheldon, licensed chiropractor, Minneapolis, entered a plea of guilty to a charge of practicing medicine without a license, filed against him following an investigation of his activities by the State Board of Medical Examiners. Sheldon was sentenced by the District Court to a term of three months in the Minneapolis Workhouse. After admonishing the defendant to confine his practice to that of chiropractic and warning him that in the event of another prosecution he would be compelled to serve the three months' Workhouse sentence, Judge Reed stayed the sentence for one year. Complaint had been made to the Medical Board by Mr. Henry Berg, Minneapolis, that Mrs. Berg had been under Sheldon's care for several years and was being treated with so-called Lowenthal capsules. Mr. Berg claims that he was being charged \$8.00 per box of 100 capsules. The prescribing or use of any such treatment by a chiropractor is a positive violation of the Medical Practice Act and resulted in the filing of a complaint against Sheldon. Mrs.

Berg's ailment has been diagnosed as paralysis agitans.

Carl Beyer, operator of the Beyer System Clinic, in Minneapolis, entered a plea of guilty to practicing healing without a Basic Science Certificate and was sentenced to pay a fine of \$200 or serve sixty days in the Minneapolis Workhouse. The defendant paid the fine. In imposing sentence Judge Reed informed the defendant in no uncertain terms that if he were brought back before the court for a second violation of practicing healing without the proper license, he would be given the maximum penalty of one year in the Workhouse with no chance to pay a fine. For several years Beyer has been operating the Beyer System Clinic and advertising the successful treatment for diabetes, gall stones and other serious ailments, over the radio and in the Twin Cities' daily newspapers. As a result of this advertising Swen Bonderson, a farmer living near Shafer, in Chisago County, Minn., took his sixteen year old boy to the Beyer Clinic for treatment for diabetes. Bonderson paid Beyer \$325 cash in advance for a successful treatment for his boy. The condition of the boy did not improve and Mr. Bonderson upon discovery of the fact that the defendant was not licensed, made a complaint to the Medical Board. Beyer was arrested on January 8th, and released on \$1,000 cash bail. The conviction of Beyer marks the end of one of the most open violations of the Medical Laws of this state. Beyer was listed in the Building Directory as a doctor. The only proof discovered by the Medical Board that the defendant was a doctor, is a diploma hanging in his office indicating that Carl Beyer had received the degree of Doctor of Herbology in 1909, which diploma is absolutely worthless in this state, in so far as any right of the defendant to practice healing is concerned.

### BOOK NOTICE

*SIMPLE LESSONS IN HUMAN ANATOMY* by B. C. H. Harvey, M.D., Chicago, American Medical Association, 1931. 434 pages. Price \$2.00.

This book has been written with the patience and care that is usually given to the preparation of a text book intended for medical men. It is Doctor Harvey's intention to present an instructive and authoritative treatise on human anatomy for the intelligent laymen.

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job and that the book can be read with a great deal of profit by medical men. Dr. Harvey has the knack of introducing into his subject just enough physiology and pathology to make his book interesting.

DAVID M. SIPERSTEIN, M.D.

*CLINICAL DIETETICS* by Gauss, Harry, and E. V. Gauss.

A text book for physicians, students and dietitians. St. Louis, C. V. Mosby Co., 1931. 490 pages, with 59 illustrations. Price \$8.00.

The material in this book on dietetics was compiled from lectures given by the author in the Medical School at the University of Colorado. An attempt is made to cover the whole subject, and gives, in a brief detailed form, the various diets which are considered of value under various disorders.

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Most of the outstanding disorders are discussed in separate chapters, including the outline of recommended diets.

The book is properly named "Clinical Dietetics" and is of use for quick, handy reference to the practitioner, but is not of value to one interested more particularly in the special field of dietetics.

A. E. CARPLE, M.D.

*THE PRACTICAL MEDICINE SERIES. General Surgery,* edited by Evarts A. Graham, A.B., M.D. Series of 1931. The Year Book Publishers, 304 South Dearborn Street, Chicago.

This volume, carefully edited by Evarts Graham in the manner of its predecessors, brings to the reader a practical review of the most important contributions to surgical literature from all over the world during 1931. Good judgment is used in the distribution of space. Thus, twenty pages are given to consideration of the thyroid and parathyroids, seventeen to cholecystography and nearly thirty to wound healing and pathologic interventions. The whole field of general surgery is well covered and liberally illustrated. It is a useful compilation and should be valuable to all who wish to keep in touch with surgical progress with a minimum of time and effort.

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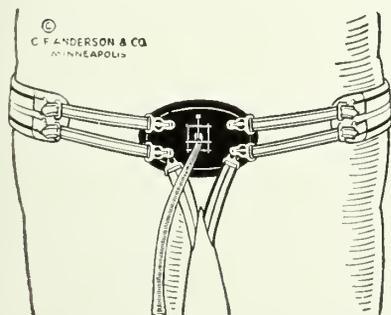
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## Further Observations on the Treatment of Fracture of the Neck of the Femur

ROYAL WHITMAN, M.D.

*New York*

**A** REPRINT of Dr. Geist's reply to certain observations appearing in the *Journal-Lancet* for June, 1930, has just come to my notice. I am particularly interested in his suggestion that, "as suits for malpractice for poor results in fractures are markedly on the increase in the Northwest, these comments of mine in the hands of an unscrupulous lawyer might unjustly cause much trouble to one or another of our profession."

This intimation, that fracture of the neck of the femur may now be classed with other fractures as within the legal danger zone, is a very encouraging indication of progress toward adoption of a common standard of responsibility.

Immunity from legal reprisal was established early in the last century by Sir Astley Cooper on the ground that it was impossible to maintain the essentials of repair, and the rules of conventional practice are based on this conclusion. These are clearly presented in the following quotation from a representative treatise on fractures—

"The ideal object of treatment, restoration of form and function, is rarely to be attempted or even sought. The first indication is to save life, the second to get union, the third to correct or diminish displacements."<sup>1</sup>

The effect of a teaching which has presented no incentive to efficiency has been to standardize neglect, as is exemplified by the report of one

hundred and twenty consecutive cases of ununited fracture at the hip, examined at the Mayo Clinic, in not one of which had efficient treatment been applied at the time of the injury.<sup>2</sup>

The abduction treatment, because it utilizes anatomical in place of artificial mechanics, is adequate both to correct deformity and to maintain apposition of the fragments. Since therefore it is in accord with the treatment of all other fractures, it is the exponent of radical reform. As such, until recent years it has made slow progress.

For, as opposed to the weight of authority and professional inertia, it has been necessary to demonstrate, not only the technical adequacy of the method to apply surgical principles, but to prove by actual experience and comparative statistics that a treatment in accord with these principles would not endanger both life and limb.

This evidence is now at hand. Dr. Geist notes that I have drawn it chiefly from foreign sources. If, on that account, it is unrepresentative, the same criticism can scarcely apply to similar reports on the old treatment, with which it must be contrasted.

In 1928, Katzenstein, of Berlin, reported on one hundred and sixty-nine cases of medial fracture treated by conventional methods. Good results were obtained in 11.6 per cent of the cases, a percentage which, according to Axhausen, who discussed the paper, fairly represented the general

<sup>1</sup>Stimson, 6th Ed.

<sup>2</sup>Henderson, *Surg. Gyn. & Obs.*, 1920, 30, 145.

experience.<sup>3</sup> Of one hundred and thirty-six cases treated at the Charity Hospital of Berlin, union was attained in 6 per cent and passable function in 16 per cent.<sup>4</sup> By comparison, the report of the Commission of the American Orthopaedic Association, selected by Dr. Geist to represent results in American clinics, in which union was attained in 53.8 per cent of the cases in which abduction treatment was applied "either in detail or principle," is sufficiently convincing. Yet this is the lowest percentage that has been recorded, lower even than that from the Massachusetts Hospital where 40 per cent of the patients were over seventy years of age.<sup>5</sup>

The most recent domestic statistics are those of Stern and his associates at the Mt. Sinai Hospital of Cleveland, of seventy-nine cases of intracapsular fracture treated by the abduction method with a mortality of less than 7 per cent and union in 67 per cent.<sup>6</sup>

There are also available, statistics from Dr. Geist's neighborhood, Henderson, during the present year, has reported on forty-two cases of transcervical fracture treated by this method at the Mayo Clinic. Union was attained in 90 per cent of the patients under sixty and 65 per cent of those over that age. Henderson concludes that, classing all deaths as failures, good results may be predicted in 77 per cent and 54 per cent, respectively.<sup>7</sup> I think these individual statistics are more reliable than the somewhat heterogenous collection represented in the report of the commission.

Dr. Geist concludes that the abduction treatment is to date the best *closed* method. I submit that a treatment based on anatomical mechanics can never be supplanted, also that the primary open operation cannot be considered a practicable alternative, as the context would seem to imply. The operation is difficult and the result uncertain. Even visual fixation of the fragments cannot assure union, and it might even prevent it. For disintegration of tissue is not unusual about a medial fracture. This may not preclude eventual union if contact is maintained. If, however, a nail had been inserted, the fragments would be held apart by the means designed to appose them.

I conclude that the open operation is not a practicable alternative to the abduction treatment. The question is whether the flanged nail is as effective as the cone graft in the treatment of ununited fracture.

<sup>3</sup>Zentf. Chir., L.V., 239.

<sup>4</sup>Hübner, Arch.f Orth. u Unfall Chir., 1930.

<sup>5</sup>Reggio, J. of B. & J. Surg., Oct., 1930.

<sup>6</sup>Surg. Gyn. & Obst., Aug., 1931.

<sup>7</sup>Annals of Surgery, 1931, 93, 968.

This conclusion is supported by the opportune publication of Dr. Smith-Petersen's experience, which is especially convincing as that of the foremost exponent of the procedure.<sup>8</sup> Twenty-four operations are reported. Four of these were for old ununited fracture and are not eligible for this discussion. Two patients died before end results had been obtained, and in one case, the good result was not attributed to the operation.

Seventeen cases remain for analysis. In this group there were three deaths, two attributed to infection, and in three instances there was failure of repair. The final results were satisfactory, therefore, in 65 per cent of the cases, or including one in which repair was established at autopsy, union was attained in 70 per cent of the cases.

Yet according to the report of the Commission which Dr. Geist has cited as authoritative, "The Smith-Petersen method of open surgical attack, open reduction and special flange nail (unpublished), was employed in thirty-one cases from two clinics. Of these 26 or 83.8 per cent resulted in proved bony union at the end of one year or more after treatment had been instituted." It would appear, therefore, that the conclusions of the Commission both as regards the abduction treatment and the open operation cannot be accepted as fairly representing either the one or the other.

Dr. Geist comments with renewed emphasis on the lack of personal statistics to support my conclusions. I have assumed that the results attained by others would furnish the strongest support for the abduction treatment, and for the standard of which it is the exponent.

Since statistical evidence in favor of the positive as contrasted with negative treatment must be reckoned in multiples of 100 per cent, it may be regarded as conclusive.

The present question at issue is not, as in former years, on the possibility of repair of the intracapsular fracture, but on the proportion of failures that cannot be attributed to lack of opportunity. This varies apparently within wide limits, as may be illustrated by the Stern report to which reference has been made:

9 of the patients were less than 30 years with union in 100%

10 of the patients were 40-50 years with union in 30%

15 of the patients were 50-60 years with union in 87%

28 of the patients were 60-70 years with union in 68%

<sup>8</sup>Archives of Surgery, November, 1931.

17 of the patients were over 70 with union in 78.5%

Thus it will appear that in the most favorable class the percentage of failure was 70 per cent and in the last favorable 21.5 per cent. In one class of ten patients union was attained in but 30 per cent; in the remaining sixty-nine, in 77 per cent.

In deference to Dr. Geist's suggestion that this omission of personal statistics might be misinterpreted, I may state that I accept Dr. Henderson's conclusions as fairly representing the prognosis in this class of cases. With such a margin of uncertainty one could be held legally responsible only for the initial opportunity for repair. Thus, as regards the abduction treatment, an X-ray picture taken through the plaster spica will supply the competent surgeon with an effective protection.

Thus far the discussion has been limited to the intracapsular fracture. It may be noted, however, that the rules of practice, ostensibly adapted to the anatomical and nutritive peculiarities of this fracture have been applied in a comprehensive sense. Thus other types, numerically as important, in which there could be no question of the capacity for repair, have fared no better.<sup>9</sup>

Function has received no consideration, either in the primary correction of deformity or after-care, or even in the analysis of what has been assumed to be inevitable disability. Thus, to quote from a British authority—"No matter whether the fracture has taken place within or external to the capsule, whether it has united by ligament or bone, shortening of the limb and lameness are the inevitable results."<sup>10</sup>

The abduction treatment is equally effective for all types of fracture and since all are now treated by the same method and with the same purpose, fracture at the hip may be considered as an entity. If, therefore, union may be attained in 70 per cent of the medial fractures and in all others, a good result may be fairly assured in 85 per cent of the cases in which the abduction treatment is efficiently applied and carried to a conclusion—as compared with 22 per cent in those reported by the British Committee.<sup>11</sup>

Finally, it has been demonstrated that the effective treatment of the fracture is the most conservative treatment of the patient, even in old age, since bed-sores and hypostatic congestion,

formerly the most important contributing factors to the mortality, have been almost entirely eliminated.

The occasion for these two communications to the *Journal-Lancet* was a comment in a paper on intracapsular fracture by Dr. Geist describing Böhler's methods, viz. "Böhler uses the classical Whitman method in spite of its too numerous poor results even in the hands of the best surgeons and orthopedic specialists, the fault probably lying in the method." I suggested that these too-numerous, implying preventable, poor results were to be attributed less to the fault of the method than to its faulty application.

The technical adequacy of the abduction method is hardly open to question, at least from a relative standpoint, since it may be demonstrated on the cadaver, at open operation, and by X-ray pictures. Its effective application, however, requires a thorough understanding of anatomical mechanics and topography—the ability to construct a plaster support, since this is the only splint at general command, and finally to adapt the treatment to a class of patients who are in poor physical condition.

According to an American writer, the abduction treatment is beyond the capacity of the "average worker," and Mosenthal concludes that the real obstacle to its general adoption is inability to meet its requirements.<sup>12</sup> This seems the most reasonable explanation of the attempts to apply the principles of the abduction treatment by mechanical appliances, all of which have been thoroughly discredited by past experience. It seems fair to assume, therefore, that the too-numerous poor results may be reduced when principles, detail, aptitude and experience are combined in the application and conduct of the abduction treatment.

I think the differences between Dr. Geist and myself are not of material importance. I am indebted to him, not only for his very complimentary allusions to my work but for the opportunity to make another contribution to the propaganda for reform as presented in the following conclusions.

Fracture of the neck of the femur, in the great majority of cases, is amenable to the rules that govern the treatment of other fractures. It is entitled, therefore, to the same consideration.

One who proposes to undertake the treatment of the most disabling of all fractures should be qualified to apply the method which has made the positive standard practicable, and I conclude, from personal experience, that one so qualified will find little occasion for substitutes.

<sup>9</sup>Stimson examined sixty-two X-ray plates of fractures at the hip received at the New York and Bellevue Hospitals. Of these 48, 79 per cent were at the base. *Locus Cit.* Of 341 cases investigated by Stebbing, 230, or 77 per cent, were extracapsular. *Br. J. Surg.*, 1927, XV, 201.

<sup>10</sup>Smith, Hamilton, 8th Ed., 1891.

<sup>11</sup>Robert Jones, *Br. Med. J.*, 1912, 11, 1589.

<sup>12</sup>*Med. Klinik*, 1929, 25, 463.

## Physiotherapy in Fracture Treatment

R. H. WALDSCHMIDT, M.D.

*Quain and Ramstad Clinic*

*Bismarck, N. D.*

**P**HYSIOTHERAPY refers to the application of certain physical and mechanical measures in the treatment of any pathologic condition. For the purposes of this discussion it consists of massage, mobilization, thermotherapy, electrotherapy and actinotherapy.

Physiotherapy should be looked upon as an adjunct to all other methods of fracture treatment. For best results it is necessary that it should be under the supervision of an individual who has had the necessary training to efficiently handle the various modalities mentioned, and who has a thorough knowledge of the normal and abnormal anatomy and physiology involved in the injury. Intelligence and good common sense is also necessary, since no machine has yet been devised that will deliver satisfactory and safe treatment automatically.

The proper use of the different forms of physiotherapy in the treatment of fractures and dislocations is, first of all, of outstanding importance to the healing of the bone. Besides, it prevents muscular atrophy and dysfunction by increasing the nutrition, promoting metabolism, and absorbing exudates about the damaged area. All of this contributes greatly to a rapid restoration of normal function.

Immobilization of recent fractures for several weeks or months, with no other additional treatment than a liberal application of time, was formerly the accepted method of treatment. It has now been proved that this is not the best procedure. Even though the bone may unite satisfactorily, the disuse of muscles and joints too often lays the foundation for a chronic disability of the extremity which at times becomes permanent. In the newer method of fracture treatment, we have learned that massage and mobilization are essential parts of efficient treatment in the majority of the fractures of long bones. They are often the most important, and sometimes the only effective agents in restoring function to the affected parts.

In the recent fracture, a gentle rhythmic superficial stroking is soothing and agreeable to the patient and most effective in relieving the associated acute pain. "Massage," as this treatment

should be applied in the recent fracture, is a misnomer. The stroking must be made so very gently over the skin that the term "caressing movements" applied by some English and French writers is more appropriate. Pressure exerted with a sufficient force to increase the pain is harmful. The soothing effect, brought about by the light caressing movements, is induced in a reflex manner through a stimulation of the cutaneous nerve receptors. If properly done before reduction, the pain will sometimes be relieved sufficiently to permit reduction without anesthesia in certain minor fractures, as for instance a Colle's with slight displacement. Muscle spasm at the site of fracture is relieved by this form of massage and a minimum of additional trauma is produced during the reduction. After muscular relaxation, edema, swelling and venous congestion are less pronounced and normal circulation will have an early return.

Relaxation of the contracted muscles is of special importance in fractures involving joint surfaces. This holds true not only for the prevention of injury to cartilages and synovia during reduction, but also for the earliest possible reestablishment of function.

As soon as the nature of the fracture has been sufficiently determined, and the limb is placed in a comfortable position, massage of the gentle type described should be started. It is best to begin some distance away from the affected region and gradually extend the movements over the fracture. Unless a bone fragment is impinging directly on one of the larger nerves, or some serious complication is present, there will be a let-up of the acute pain and the rigid muscles of the parts will show a relaxation. It may take a half hour's stroking, or longer, to accomplish this, but the time is well repaid by the comparative comfort to the patient, and by the easier and less traumatizing movements required in connection with the reduction. Some form of anesthesia will, of course, be necessary in the reduction of most fractures. But, the quantity required will be much less in the cases where light massage has been applied properly before the anesthetic is started (or injected).

This "caressing" massage is an art more difficult to acquire than first appearances would indicate. Very few professional masseuses or masseurs have learned it. The usual, and time honored, form of massage implies a pressure hard enough to compress and evacuate capillaries, lymph vessels and even exudates. This is not intended in the first treatment of fractures, but must be strictly avoided.

The physiologic principle involved seems to be as follows: Immediately following the trauma, and the thrusting of sharp bone spicules into the surrounding tissues, the neighboring muscles react with a firm and lasting clonus. The muscle contraction prevents a release of the pressure and the irritation on the nervous network. The muscle spasm, or "défense musculaire," therefore, continues. Gentle and soothing manual stroking over the cutaneous nerve endings seems to hypnotize the motor nerves and induce them to cease their impulses to the muscles and bring about a relaxation of the latter (Lucas-Championniere).

Shortly after reduction and after the acute pain has subsided, massage, as the term is generally understood, should be practiced at least once a day. The time to begin may be one or several days after reduction. But even now it should be remembered that the pressure of the stroking hand must be painless. Painful massage is harmful massage.

The purpose of the massage during the first two or three weeks after fracture is to reduce swelling by evacuating the blood and lymph exudates, to stimulate the circulation about the site of fracture and to give the muscles passive exercise.

Active motion is another important aid to promote healing and lessen the time of disability. Even the mere efforts at active motion, i.e., an alternate contraction and relaxation of the muscles, while the limb is confined under the plaster cast or splints, is serviceable to keep up the muscular tone and prevent atrophy. Later, after fixation of the bone fragments is of sufficient strength, careful movements, flexion and extension should be made each day, while the fixation apparatus is temporarily removed. When the healing of the bone is sufficiently advanced, additional functional tasks should be required of each muscle group.

When the muscles have received constant attention during the healing of the bone along the lines indicated above, they are all ready for full function as soon as the fracture has united. The healing of the bone is also aided and abetted by the

daily exercises, and the time of disability is materially shortened.

This method of fracture treatment is more exacting on the surgeon's time and attention than the simple application of a cast and then paying little or no attention to the injured extremity for several weeks. However, the results are so much more satisfactory to patient, surgeon and compensation bureaus that it will repay every surgeon to take the necessary time and trouble to familiarize himself with this form of fracture treatment and to practice it on his patients.

Application of some form of heat each time before the massage is given increases the arterial congestion and aids in the absorption of the exudates. Heat is also very serviceable for the relief of soreness and pain in the traumatized tissues.

Thermotherapy may be applied in various ways, by bake oven, electric light bulbs under a cradle, therapeutic lamp, or diathermy. It is important that the heat be of low intensity and applied over a comparatively long time. Care must be taken with all these methods that the heat is held at a moderate degree, or more harm than good may be produced.

Infra-red radiation to the extremities restores circulatory equilibrium and is, besides, a stimulator of the general metabolism. The lamp should be placed fifty to seventy-five centimeters from the part treated, and the time of treatment should be from thirty to sixty minutes.

Diathermy is a very useful method of applying heat since its effect is transmitted deeper and more directly to the injured part. However, it should not be used the first few weeks after the fracture. The treatment should be applied with 400 to 500 milliamperes for twenty minutes. The electrodes should be larger than the cross section of the injured limb. Each treatment is to be followed by massage for ten to fifteen minutes.

Diathermy produces a localized hyperpyrexia. Many consider it superior to all other forms of heat therapy because of its penetration to the very spot where its application is needed the most. The benefits derived from its use are: Increase of local heat; improvement of metabolic efficiency; relief of pain; maintenance of muscular tone; resistance to bacterial invasion; and prevention of atrophy in the extremity distal to the fracture. Diathermy alone, or in combination with ultraviolet, is often of great value in delayed union of fractures.

The sinusoidal current is stimulating to the tissues through its mechanical effect on the cells. The deep rhythmic muscular contractions pro-

duced are beneficial exercises for the prevention of atrophy.

The Bristow Coil of low voltage is very serviceable in maintaining muscular tone and preventing atrophy. By its use, certain groups of muscles may be stimulated without disturbing other groups.

Ultraviolet is useful in some cases with delayed union where defective calcium metabolism is the cause of the delay in callous formation.

Special and careful attention must be paid to the firm fixation of the fragments during the application of all these forms of treatment.

Physiotherapy is not a form of treatment to

be applied as a last resort for rehabilitation purposes, weeks or months after the original injury, nor after all other forms of treatment have been concluded or found wanting. It is, on the contrary, a necessary adjunct in the treatment of fractures from the time of the accident, not only for the comfort of the patient and the promotion of early union of the bone, but also for the shortening of the period of disability. Its true usefulness for the latter purpose is appreciated by comparatively few in our profession. The subject is worthy of a deeper study than most of the textbooks on fracture treatment would indicate.

## The Mechanics and Treatment of Fractures

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*Dickinson Clinic*

*Dickinson, N. D.*

**B**ROKEN bones are frequently sustained in severe accidents where it is necessary to carry the patient long distances for treatment. If it is a simple fracture we could immediately commence the necessary procedures for diagnosis and care, but such is not always the case. While it is true that the patient may be fractured, they have also had a long cold ride and could be in impending shock. An immediate anaesthetic or manipulation would complete the trauma and induce shock. If they have had a bad time, I believe the fractures should be made as comfortable as possible with pillows and the patient allowed to warm and rest, with the aid of morphine. This preliminary period of treatment will vary with the condition of the patient and severity of the accident. It seems that everyone must have an unpleasant experience in neglecting this phase of the treatment before it is sufficiently respected. I have seen one fatality and have heard of others where the local condition was elaborately handled, but the pulse pressure was taken for granted until a fatal shock had supervened.

### FRACTURE OF THE SKULL

The mechanism of fracture varies according to the area of bone in contact with the force and with the velocity and site of the force. When a small object at relatively high velocity such as a thrown stone, strikes the vault of the cranium, the point of impact absorbs the blow. Before the impetus of the missile can overcome the inertia

of the mass of the head by transmitting its force in all directions, the area of contact depresses and fractures. After the break the fragments cannot recoil and the result is a depressed fracture with short radiating fissures. The impact has been absorbed locally and the only damage sustained is locally. If it is amenable to treatment the results are usually satisfactory as the remainder of the skull and brain is unharmed.

If the striking object has less velocity or comes in contact with the skull over a wider area such as occurs when striking the head on the ground in a fall, the force is distributed throughout the skull and brain. The skull is elastic and compression occurs along the axis of the direction of force. When the limit of elasticity is reached a fissured fracture radiates from the area of impact or at the weakest and least elastic portion of the skull, which is the base.

At times the fracture appears at the periphery of the skull at right angles to the direction of force. This is due to the bursting nature of the compression. With the forcible, but momentary and violent change in shape of the interior of the skull, together with the direct blow, the brain and its membranes are wracked and torn. The skull springs back to its normal shape immediately but the brain recovers, if at all, only after a long and doubtful convalescence.

The base is not only the weakest and most frequently fractured part of the skull by reason of its

rigidity and numerous foraminae, but its approximation to all the natural septic cavities of the head further enzhards a fracture of the base.

#### TREATMENT

In skull injuries the treatment is directed towards the brain damage. Place the patient in a quiet room and insure rest and lessening of possible bleeding with morphine even though the patient is unconscious. Ice caps about the head may also aid in inhibition of intracranial bleeding. If the nose or ear is bleeding allow it to drain. This hemorrhage usually ceases spontaneously. Do not take radiographs of the skull until the patient is out of danger. To get skull pictures of diagnostic value, necessitates a long forcible handling of an extremely ill patient. The treatment would not be modified by any radiographic findings. A depressed fracture could be ascertained usually by palpation. Almost the only time when emergency surgery is necessary in skull injuries when there is increasing cerebral depression is in the case of subdural hemorrhage. Lumbar puncture is another means of bothering a patient without aiding him. The presence of gross blood or a few erythrocytes in the fluid only confirms a diagnosis already most certainly made. No benefit of any lasting value is obtained. Intravenous hypertonic saline solutions produce a temporary shrinking of the cranial contents but this soon passes and if the patient is not worse, he is not improved. The great majority should be quietened with sedatives and left alone.

Brain injuries of babies occurring at a spontaneous or difficult delivery, are to be suspected when the baby does not breathe well, or becomes cyanotic when the air passages are unobstructed. Autopsies have shown that bleeding may occur at any point of the brain or membranes. The usual site is from a tentorium tear. If they do not die, they seldom recover from the cerebral impairment which produces spastic paresis with usually some mental inability. A lumbar or cisternal puncture in these cases usually reveals gross blood. I have not seen any therapeutic value in a small number of cases where this was performed. In head injuries where no fracture of the skull exists, the brain injury may be quite as serious and leave a similar train of sequelae.

#### FRACTURES OF THE NOSE

Broken nose is a term used to designate several types of fracture. The usual break is a depressed fracture near the inferior border of one or both nasal bones. This also depresses the attached nasal cartilages and further increases the deform-

ity. The lateral border of the nasal bones may be displaced over the corresponding frontal process of maxilla. The cartilages may be torn from their attachment to the nasal bones. Both nasal bones together may be displaced to one side. In the majority of cases the septum is also fractured and displaced to one side.

#### TREATMENT

Active adequate reposition of fragments is necessary. A general anaesthetic is frequently advisable. With a rubber covered curved forcep or elevator beneath the depression the fragments are elevated into position and moulded into shape. The septum is corrected at the same time. The septal correction is very important as nasal obstruction from deviation frequently follows. It is usually necessary to insert a nasal pack in each side to prevent a collapse of the fracture and to insure straightening of the septum. Do not give a good cosmetic prognosis.

#### FRACTURES OF THE JAW

The jaw bone is fractured by direct violence. The break may occur at any point, but the majority occur at the angle or just behind the last molar tooth, or just in front of the mental foramen. The posterior fragment is raised and pulled outwards. The anterior fragment is slightly depressed by the hyoid muscles. If the fracture occurs at the angle the temporal and masseter muscles on both sides support the anterior fragment so that little deformity results.

#### TREATMENT

Many appliances have been used to hold the fragments in position until healing occurs. The results from wiring the lower jaw to the upper to secure immovability are satisfactory. Teeth loosened at the accident if left will become firm. Septic or broken teeth may be removed. If there is not already a suitable space to insert a feeding tube it will be necessary to remove a tooth to admit one. To hold the fragments, a tooth behind the fracture is wired, and about three other teeth in front of the fragment and on opposite side of jaw are wired. Wires are twisted around corresponding teeth in the upper jaw. This is usually possible without an anaesthetic. If narcosis is necessary the two jaws are not wired together until all possibility of vomiting is past. It is better to postpone the wiring for some hours if the patient has recently had a meal on account of the danger of vomiting when the jaws are wired together. A tonsillectomy aspirator is helpful when doing this work. A bronze wire is especially

made for this operation but the ordinary brass snaring wire or copper wire will do very well. It is usually best to encircle the teeth twice with the wire before twisting it up. Unless it is well up on the neck of the tooth and in the gum substance it will slip down. One circle around the molars usually suffices. If the teeth are irregular in number or position it may be necessary to encircle two teeth to get a satisfactory hold. Then the upper and lower wires are twisted together with the fragments in line and occlusion normal. The ends of the wires are brought out over the lips and loosely twisted and covered with dentists' gum rubber. The mouth is irrigated many times a day and feeding is accomplished through a tube. Healing occurs at four weeks.

#### FRACTURE OF THE CLAVICLE

The clavicle is one of the most frequently broken bones in the body. The fracture is usually due to a force transmitted from the hand or shoulder and due to its buttress action in keeping the shoulder out in position, it is caught between the force of the injury and the weight of the trunk. If this compression is sufficient, the bone usually breaks at about its mid length. The outer fragment drops due to the weight of the arm and is adducted by the adductor muscles.

#### TREATMENT

The actual weight of a hanging arm in a 150 pound man is over 12 pounds. The greatest deformity is due to this weight pulling downwards, forwards and inwards. The logical treatment should hold the point of the shoulder upwards, backwards and outwards. If the fragments are not completely displaced, a manipulative correction followed by a broad band of adhesive across the fracture, and the arm placed in a sling will suffice. If there is displacement of the fragments and obvious deformity, where a perfect reduction is necessary, there is, I believe, only one course to follow. The patient is placed on the back on a flat bed with a pad between the shoulders and with the elbow elevated on pillows. In this way the reduction is accomplished by gravity and after ten days the patient may be allowed up with a sling. It is infrequent even in women to successfully continue this method until union begins. The alternative is one of the many attempts at fixation when the patient is ambulant. Of the many dressings, hitches, and appliances used for this fracture the same result usually occurs, namely union with slight deformity but perfect function. The movability of the opposite shoulder, the neck, and all the muscles which surround the upper part of the

thorax render it almost impossible to apply any apparatus which actually lifts the arm and keeps the shoulder back day after day. Böhler's method which I tried a few times consists of keeping the arm elevated by a large block of wood suitably shaped to fit the axilla comfortably and held there by straps over both shoulders. This did hold the arm up for a short while before the patient finally shifted his shoulder mechanics so that in time the arm was at almost its original position. At least any improvement that was noticed did not warrant the continued wearing of so troublesome an apparatus. I have given up this method for that which Cotton suggests. It is a board about 4 inches by  $\frac{1}{2}$  inch and long enough to reach across both shoulders at the back. Each shoulder is fastened to this brace by means of adhesive straps. The arm is elevated by a sling and the support continued for three weeks. This dressing is simple, comfortable, and as efficient as an ambulant splint for this fracture is possible.

#### FRACTURES OF THE HUMERUS

The function of the legs is to bear the body. This they must do regardless of age, weight or occupation. They constantly carry one, efficiently, unconsciously and perhaps gracefully. The action must be equally divided between the two legs. One limb cannot assume the work of the other, as may happen with the arms, without disturbing the body equilibrium. A slight imperfection following a fracture of the lower extremity will impair the walking efficiency of the legs, while a greater amount of deformity in the upper extremity would remain unnoticed. The function of the upper extremity is to grasp and move objects. There is no weight compressing the length of the arm and the carrying strain is taken by the muscles and ligaments. The usefulness of the arms may be transmitted from one to the other and the necessity of arms varies with age, sex and occupation. Irregularities in length or shape are usually not a detriment to the usefulness of the arm and are hardly noticeable to patient or onlookers. For these reasons a malposition as seen by the radiograph of the arm will still enable a satisfactory function while the slightest inequality of the leg fractures will be sufficient to alter the posture and gait.

#### THE UPPER END OF THE HUMERUS

The fracture usually occurs about the surgical neck of the humerus. The upper fragment if there is the usual displacement, is abducted and rotated outward by the short abductor muscles inserted into the tuberosities. The lower frag-

ment is adducted by the muscles inserted into the bicipital groove and rotated inwardly by the same group. The biceps, triceps and deltoid muscles cause most of the shortening.

#### TREATMENT

To treat this fracture, the lower fragment must be abducted to a right angle with the body to align it with the upper fragment. It is rotated outwards about 90° to correct the upper fragments outward and the lower fragments inward rotation. Finally, traction is exerted to reduce the shortening and bring the two fragments into coaptation. The arm is brought forward about 30° from the frontal plane. Traction is continued in this position of correction until the shortening is reduced and healing has begun. The surest way of getting a trouble free reduction is to keep the patient in bed on his back during the traction and commencement of healing and reserve the elevated abductor splint for those who have beginning union in good position. If sufficient traction to reduce the fragments into good position has been used and union has begun, the type of abduction splint used is of little consequence. The arm may even be allowed to come down to an angle of 45°. I think the usefulness of early active and passive movements, massage and diathermy has been over stated at the expense of careful anatomical reposition and union. Unless in aged patients or when they suffer concomitant injury, the joints about fractures are usually limber by the time the limb is healed due to the eager attempts at movement of the patient. I do not mean that movements of joints and diathermy eager attempts at movement of the patient. I do not mean that movements of joints and diathermy does not have an important function in certain types of fracture.

#### FRACTURE OF THE SHAFT

The break is either transverse, oblique or spiral. The deformity is principally an over-riding with shortening. If the fracture is oblique or spiral, apply traction in a moderately abducted position. If the fracture is transverse, an attempt may be made to engage the two ends by manipulation while traction is applied. Anterior-posterior splints aid in keeping the parts from bowing. An anterior flexion should be watched for, as the pectoral muscles tend to bring the upper fragments anteriorly. If it is difficult to manipulate a transverse fracture it is better to apply traction as the radial nerve is in greater danger from manipulation than in the original injury. Frac-

tures of lower end of shaft should be treated much like supra condylar fractures.

#### FRACTURE OF THE LOWER END OF THE HUMERUS

The fracture occurs a short distance above the elbow joint and usually runs transversely, but may extend into the joint. The lower fragment is commonly found posterior to the upper and in a varus position. If the injury has been a direct blow on the flexed elbow, the lower fragment is found in front of the humerus. Its shortening is caused by flexor and extensor muscles. The medial epicondyle, which is part of the lower fragment, serves as origin for the flexor and pronator muscles of the elbow joint. These muscles are very active and when the fracture occurs they flex the lower fragment and the forearm goes into a position of mid pronation due to contraction of the pronators. If the forearm is supinated, as Böhler mentions, the pronators are tensed and pull the lower fragment into a varus position, while if the forearm is pronated, the pronators relax and allow an easier reduction and overcoming of the varus position.

#### TREATMENT

The lower fragment is replaced and immobilized until union occurs. The ways and means of doing this are various. In recent fractures it is usually possible to reduce by manual traction and hold in place by a moulded cast in a position of flexion. In cases where this fails the lower fragment is reduced by pin traction through the olecranon. In a manipulative case the shortening is overcome by traction through the forearm. The anterior or posterior displacement is corrected by manipulation at the time the shortening is overcome. Then any varus position is corrected and the arm is rotated outward to recover the carrying angle and to align up the lower fragment with the outward rotation which has occurred in the humerus. Finally the forearm is pronated to relax the pronator muscles, and the elbow is then flexed as much as is compatible with the swelling and circulation at the extremities. The flexion tightens the extensor muscles and is responsible for preventing a recurrence of the backward dislocation and its shortening. A plaster moulded splint is then placed on the posterior aspect of arm from the axilla, down behind the elbow and along to the wrist. This is kept applied to the arm with a few circular bandages and the whole rests in a sling. After three to four weeks the cast is removed and the forearm allowed to gradually lower.

## FRACTURE OF THE OLECRANON

This fracture is caused by a fall on the flexed elbow which breaks the olecranon across at the base. If the fracture is complete it is pulled upwards and tilted back by the triceps tendon which allows the radius and ulna to shift forwards.

## TREATMENT

If there is no displacement of the fragment, a circular plaster cast with the arm in extension is required. If the fragment is pulled up by the triceps, open reduction and wiring or plating the ulna is necessary. Union is slow and some impairment of extension usually occurs.

## FRACTURE OF HEAD OF RADIUS

This fracture occurs more frequently associated with other fractures about the elbow than alone. The fracture line is usually transverse, below the head, and may be comminuted. The orbicular ligament has a tendency to keep the head in good position.

## TREATMENT

When these cases are treated conservatively with the forearm in supination, many get as good results as when the head is removed. If the elbow becomes stiff the head may be removed later without interfering with the rotation of the forearm.

## FRACTURE OF BOTH BONES OF THE FOREARM

These fractures are usually transverse and at about the same level. The upper fragments are drawn together and pronated. The four fractured ends may be in almost any combination of positions depending on the type of accident.

## TREATMENT

It is very difficult and infrequent to get any kind of a position of the four ends by giving an anaesthetic and working with the ends even under a fluoroscope. If there is displacement of both bones and it is possible to entangle the fragments, by the time a splint or cast is applied they are usually displaced again. A certain percentage will require open operation with bone plating, but first try extension by adhesive traction on the forearm with the patient in bed and the forearm flexed and held above the bed. Usually the weight of the arm is sufficient counter traction. Anterior and posterior splints are applied to the forearm. Keep the hand in supination. After healing has begun in about two weeks an anterior posterior splint may be used on the forearm, and arm kept in sling. Too much manipulation or open operation increase the possibility of a synostosis.

## FRACTURE OF LOWER END OF RADIUS

This fracture most frequently occurs after a fall on the outstretched pronated hand. The line of fracture begins slightly less than one inch above the wrist joint and transversely, runs obliquely backwards and slightly upwards. This fracture plane forms at the impact and as it is an inclined plane the lower fragment is crushed backwards on the inclined plane of the upper fragment. The lower fragment with the hand is therefore displaced backwards which constitutes the first deformity. This alone is the principal cause of the typical "silver fork" appearance. The lower fragment is not only displaced backwards. It rotates backwards also so that the face of the articulating surface looks backwards rather than straight down and slightly forwards as is its normal position. This constitutes the second deformity. Finally, as the fall on the outstretched hand strikes greatest on the thenar prominence the lower fragment is also deviated towards the radial side. There is produced a threefold deformity, dorsal dislocation, dorsal rotation and radial deviation. The very nature of the injury makes for a compression fracture with impaction. It is not always that the dorsal dislocation occurs. The principal deformity may be an impacted compression fracture, with only a dorsal rotation. In about one half of the cases the styloid process of the ulna is also fractured.

## TREATMENT

In treating this fracture the most frequent cause of failure is under-correction. The under-correction is usually due to insufficient disimpaction. Many styles of grips and flourishes are described for reducing this deformity painlessly and with dispatch. I prefer an anaesthetic, local or general, depending on circumstances, and before the fracture is reduced I find that I have used most of the described and some of the undescribed manipulations. The first movement is to disimpact. An assistant steadies the forearm and with the thumbs and fingers of both hands on the lower fragment it is rocked and pulled until it is quite loosened from the upper fragment. The dorsal displacement is corrected now by holding the lower part of the upper fragment on the thenar eminence and with the other thenar eminence the lower fragment is crushed down into its normal position, at the same time tipping the end of the bone downwards to overcome the dorsal rotation. The radial deviation is corrected manually and with the wrist flexed  $45^\circ$ , and all the deformities reduced, the forearm is now

placed between two previously prepared splints or a dorsal moulded plaster cast. If an anterior posterior splint is used an extra pad is to be placed on the dorsal surface of lower fragment and one on anterior surface of upper fragment. After two weeks begin slight movement at the wrist joint and gradually increase. The splint may be removed at the end of four weeks.

#### FRACTURES OF THE FEMUR

*Upper End of Femur.* These fractures may be divided into fractures which occur within the capsule, where the break occurs through the neck usually close to the head, and those which are extra capsular and occur near the trochanters. The intracapsular fracture occurs in old people, especially women, and is caused by an atrophic condition which occurs in the neck of the femur. The line of fracture is usually transverse. Impaction of the neck into the head occasionally occurs. The lower fragment is displaced upwards by the glutei, rectus and hamstring muscles and is also rotated outwards. The fracture surface of the lower fragment looks almost directly forwards.

#### TREATMENT

The upper fragment is quite indolent at best. Most of the repair must originate from the lower fragment. As in any other fracture the surest way of obtaining union is to have an accurate coaptation and keep it until union takes place. An unreduced impacted fracture where a large surface of the fractures are impacted usually heals well. This is the most favorable condition in which to have this type of fracture. If it is impacted at the accident and sufficient bone is in contact, immobilize without disimpaction. If the fracture is loose reduction of the deformity is necessary so that the two fractured surfaces are in contact. To accomplish this the patient is placed on a fracture saddle and both legs are held while the fractured side is pulled to reduce the shortening. As the head of the femur is in an abducted position, both legs are abducted, the fractured leg more than the normal. The amount of abduction necessary varies. It is usually 45° or more from the vertical. As the femur had rotated outwards, it is now necessary to invert it to complete the reduction of the deformity. Cotton has advised, in addition to this method of Whitman, artificial impaction by padding the trochanter and with a 12 pound wooden mallet and slow, shoving, follow through blows to impact the fragments after the reduction has been done. The next problem is to keep the fracture in this position

for about three months. It is this continued confinement to bed which complicates the care of these old people, as they usually have some other ailment by the time they are old enough successfully to get a fractured hip.

The plaster spica is the best method of keeping immobilization. Cotton advocates the double spica with the bar, which holds the pelvis well and renders the patient more easily cared for, as the cast only comes up a hand's breadth above the pelvis. The patient can half sit and roll over on face which rests the back and comforts the patient considerably. After three months the cast is removed and gentle mobilization of the limb in bed is practised. If union is favorable by radiograph, the patient may get about slowly on crutches and at four months can begin to put weight on the foot. At six months walking may be attempted. With absorption of the head or slow union some improvement is possible after three months in using a walking splint of the "Thomas Caliper" type.

#### EXTRACAPSULAR FRACTURES

This fracture is due to violence acting transversely upon the greater trochanter. The lines of fracture may encircle the base of the neck which may become detached. The greater, or lesser trochanters, or both, may separate. Union occurs readily in this fracture but a coxa vara position with outward rotation is its natural tendency.

#### TREATMENT

Traction with adhesive, usually about fifteen pounds, with the leg moderately abducted and external rotation corrected and prevented.

#### FRACTURES OF THE SHAFT OF THE FEMUR

The upper fragment is pulled forward in upper third fractures by the ilio psoas and abducted and everted by the gluteus and external rotators. The lower fragment is drawn upwards and to the inner side of the upper by the hamstring and adductor muscles.

In fracture at the middle third the principal deformity is overriding and angulation.

In fracture of the lower third, the lower fragment is often tilted back by the gastrocnemii. In juveniles the lower epiphysis is sometimes displaced either forwards or backwards. I saw a case not long ago where a 12 year old boy caught his leg in a power belt. He was treated by a bonesetter for four days before being brought in. The epiphysis had been cleanly dislocated forward. Gangrene from occluded vessels had begun in the toes, and amputation was necessary. On manipulating the amputated limb after the

muscles had been stripped, I forcibly acutely flexed the knee joint and the epiphysis snapped back into position perfectly.

This would be worth trying if another similar case were seen before gangrene had occurred. I know of another case where a loaded barrel fell across a young man's knee fracturing both femora just above the epiphysis and gangrene followed necessitating bilateral amputation.

#### TREATMENT

All fractures of the shaft of the femur are best treated with a Thomas splint and traction. The ring of the splint must be made to fit correctly and the traction should be sufficient and in the direction which the upper fragment points. Adhesive plaster traction may be sufficient for some women and juveniles but using adhesive on a vigorous man with fracture of the femur and shortening is like sending a boy on a man's errand. The majority require bone calipers, pin through the bone or a Kirschner wire with 15 to 25 pound traction. This should be used at the commencement of the treatment when traction is most useful, and not after repeated attempts to get traction with adhesive. In fracture of the upper third, apply traction to the lower fragment with calipers so that the whole leg is high and the pull is in the line of the pointing upper fragment.

In fractures in the lower third, apply tongs and with traction the reduction occurs. The tongs are applied to the side of the condyles and the knee is flexed. If it is a T fracture into the joint, the tongs are also used and will aid in bringing fragments closer together and will allow joint movement which is important in any joint involved fracture.

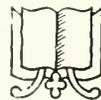
#### FRACTURES OF THE LEG

Fractures of the leg tend to occur in the lower half of the tibia and fibula. The fractures depending on the type of injury may be transverse, oblique, spiral, comminuted or compound. The fibula is relatively unimportant from a consideration of results of treatment. The principal deformity is shortening, comminution and some angulation. The whole weight of the body converges down through the tibia to the tarsus. The

lower half of the tibia and fibula support the body shocks, and it is here, in particular, that the line of weight bearing should be straight. Shortening in a straight leg is more satisfactory than a well healed tibia with angulation. The angulation will bear the weight but it disorganizes the mechanics of the foot. To retain the function of the foot and ankle joint it is necessary to "set" these fractures very accurately. About the ankle joint the commonest fracture is the Potts, or fracture of the fibula above the joint, due to forced eversion and abduction. Commonly the end of the medial malleolus separates, or possibly only the medial talo-tibial ligament. This allows an exaggerated pronation of the whole foot. The other accidents which happen about the ankle are a bimalleolar fracture with medial partial dislocation of the tibia and the bimalleolar fracture with posterior dislocation where the posterior rim of the lower end of tibia is carried back. This latter condition was described by Cotton and bears the name of Cotton fracture.

#### TREATMENT

The fragments should be reduced as soon as possible after the injury. An anaesthetic with traction and manipulation is attempted first. If this fails, continuous traction will be necessary either using the Sinclair skate, a Steinman pin through the heel, or tongs into the malleoli and manipulation when extension is complete if necessary. If after manipulation, or traction, the ends may be locked, fixation may be completed by plaster cast. In oblique or spiral fractures the traction is continued until healing occurs. Open operation is required more frequently for healed, inadequately treated fractures in this region than for fresh fractures. Comminuted fractures should be treated by traction to recover the length, and they heal well and give good results if the alignment is normal. Potts fractures are reduced manually by strong inversion of the foot and a cast is applied with the foot at right angles to the leg. The foot is corrected sufficiently. It cannot be over corrected. When reduction is accomplished invert the foot slightly before fixing in the cast.



## Compound Fractures

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A COMPOUND FRACTURE is one which communicates with the outside by way of the skin or through a mucous surface (Cotton). Such fractures vary greatly in size of this communication, depending largely upon the cause of the injury. There may be extensive lacerated wounds from crushing injuries or simple punctures from a sharp agent, as a piece of metal, glass, or bullet. Regardless of the size or the length of the communication as long as there is an opening the fracture is compounded. The treatment, therefore, cannot be based upon a fixed routine, the choice being decided by the type to be dealt with, and the experience with similar cases.

All compound fractures are handled as infected cases regardless of their mild or terrifying appearance, but that does not necessarily mean that they be treated alike. From experience we know that it is not necessary that there be wide debridement of simple puncture fractures, nor that all can be cleansed and simply closed. The essential procedure, I think, should be based upon the form of treatment which you would select if the fracture would be closed, plus such conservative or radical additions for the complicating factor.

We have attempted at various times to try fixation on the table followed by closure of the wound, and found some of them must be opened widely to secure adequate drainage of the infected material. One can go to the other extreme and treat all cases primarily for the expected infection and neglect the fracture with subsequent increase in the amount of deformity and disability. It can be seen that we have to deal with two possibilities, both a fracture and an osteomyelitis, and our treatment must be based on a combination of these two.

There can be no question that proper cleansing of the wound is essential, but it must be remembered that infective material can be carried into a wound as well as washed out. The prophylactic treatment being intended to clean up the wound, the amount of debridement is of paramount importance. I believe we have gotten away from the very extensive extraction of material

such as was practiced in war time. It is necessary that all foreign material be removed unless such removal will include structures necessary to the life of the part. Better then to do an amputation first than last. With proper care, however, such material can be adequately separated from the vital tissues. The problem here is not to remove too much nor too little. One can be bold and yet conservative, the accepted rule being to remove all foreign material and devitalized tissue, leaving bone fragments which are attached by periosteum. In simple puncture wounds especially those caused from within by sharp ends of the fractured bone, the danger of infection is at a minimum. Simple iodizing of the wound followed by a correction either by splint or cast, or by some form of fixation and immobilization, which one is accustomed to using, is usually sufficient. The fracture should be carefully watched for signs of infection which can be dealt with before it becomes widespread; the wound being left open for drainage, out not in, and proper reduction of the fracture secured. If the wound be from without, inward the danger of infection is increased because one never knows what has been carried into it. Here the question of treatment becomes more disturbing, should the wound be widely exposed or simply iodized with an applicator. If it is just a matter of taking a chance the latter is by far the easier, and sometimes works nicely. I think it better not to leave too much to chance, but see if there is anything in the wound and then leave ample drainage with protection, since it is impossible to be sure that a wound is clean. I believe that extensive lacerated wound or crushing injuries do not cause such prolonged worry as the expectant treatment since most of them cannot be closed. Your problem is before you and you can rely on your experience more confidently. Drainage is simple and if the method of Orr is used, your results will be uniformly satisfactory. I can refer you to his book with confidence.

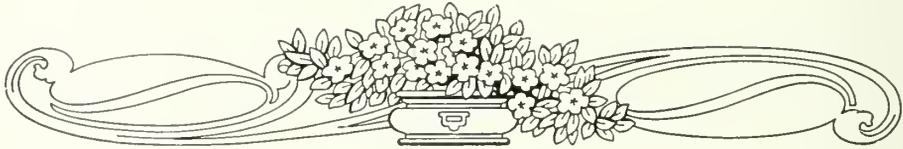
There are certain factors which we have to consider in all injuries of this type and may decide the ultimate outcome. Shock is usually greater in compound fractures than in closed ones, and should be attended. The patient should

not be disturbed; the fracture can be immobilized without much handling; absolute quiet is essential. X-rays can always wait until the dangerous period is passed. Heat should be applied to the body and necessary stimulants given. Hemorrhage should be controlled by tourniquet or vessels clamped. If there has been great loss of blood a transfusion may be indicated. Adequate amounts of morphine may be used to control severe pain or restlessness. Subcutaneous or intravenous saline and glucose provide needed fluids. Do not permit additional injury by involuntary movements of a delirious patient, or contamination of traumatized tissues.

After your patient is in condition for it, your attention can be turned to the fracture. The procedure is largely mechanical, cleansing of skin, soft parts and bone. Removal of devitalized parts, both soft tissue and bone, and all foreign material as previously mentioned. Leave adequate drainage, not attempting to close the wound expectantly. I use the vaseline dressing of Orr. As we are dealing with a fracture we must see that it is properly reduced so as to secure the best function, and if possible, anatomical restoration. The

method of reduction is not as essential as the results to be obtained, and may vary with one's experience. If immediate reduction can be secured, fixation in a plaster cast or splint with access to injured area is adequate. Many compound fractures heal poorly and non-union is not uncommon; therefore, if the operative treatment such as plating or the like is necessary, it would probably be better to wait several months or at least until all danger has subsided before encountering the danger of a flare-up of some latent focus. The prevention of deformity should be kept in mind while waiting. The usual precaution of tetanus antitoxin and, if indicated, serums for the anaerobics should not be forgotten.

I have not entered into a discussion of the Carrel-Dakin treatment as I have not sufficient experience with its use. Nor have I any brief for the advantages or disadvantages of any special type of fixation, except that I use plaster to maintain position and immobilization whenever possible. Everyone has some method of procedure which he is accustomed to follow, if your results are justifiable that method answers the problem.



## Fracture Symposium and Joint Meeting

*of the*

Minneapolis Regional Sub-Committee of the General Fracture Committee of the American College of Surgeons and the Minneapolis Surgical Society

Meeting of February 3, 1932

J. F. CORBETT, M.D.: As president of the Minneapolis Surgical Society, I have been requested to call this meeting to order. After a few general statements have been made the conduct of the meeting will be turned over to Dr. Kenneth Bulkley, chairman of the Minneapolis Regional Sub-committee of the General Fracture Committee of the American College of Surgeons.

There has been a tendency in this locality for general surgeons to neglect fracture treatment, possibly because of the lure of abdominal surgery. This is not true to so great an extent in other places, as the work of Scudder, Speed, Stimson, Blake, Ashurst, Böhler in recent times demonstrate. The early fundamental principles of bone repair and of fracture treatment were largely in hands of general surgeons. Notably with Murphy, Senn, Parks, MacEwen, Ashurst, Cheyne, and Burghard, Lister, Brandenheuer, Trendelenburg, Bunger, Dawbarn, Handley, Freeman, König, Lane, Langenbeck, McBurney and Cotton. More recently the diligence in publishing and the scientific efforts of Robert Jones, Albee, Whitman, Hibbs have made the impression that fractures were an orthopedic problem.

It is manifestly impossible that all fractures could be treated by the relatively few orthopedic men available. This problem is still a duty of the general surgeon. The purpose of this meeting is to make general surgeons fracture-minded. It is hoped that the general surgeon will see that he ought not to neglect this field. This entails interest in the subject, careful study, and the solution of problems that are still unsolved. The field is enormous and can not be discussed in a few minutes except in a general way. This will be gone into in more detail by those that follow me. Unless his interest is manifest, and some fruits of his interest are developed, the question of fractures will pass from the realm of the general surgeon.

KENNETH BULKLEY, M.D.: The American College of Surgeons was incorporated in 1912,

emerged from its swaddling clothes in 1913, and thereafter rapidly grew to young manhood. Among its accomplishments to date, the outstanding undoubtedly relates to the betterment of hospitals through its so-called hospital standardization work. With its success in that field not only we of the medical profession but also many of the laity are familiar. Its hospital work has progressed so far that little more than supervision is now necessary.

More recently it has turned its attention to another fertile field, the betterment of the care of fractures; and for the care and supervision of this work it appointed what is known as the General Fracture Committee of the American College of Surgeons. In each of the larger centers of population in this country the committee has appointed a regional chairman with instructions to form a local subcommittee whose function shall be to promote interest in the subject of fractures, to watch over the treatment of fractures in hospitals, and to constructively aid in the teaching of the subject not only to undergraduates but to graduates. My old friend, Dr. Charles L. Scudder, of Boston, with whose classic book on fractures you are all familiar, is chairman of the General Committee of the College. Failing in his usual good judgment, last fall he requested me to undertake the organization of a regional subcommittee on fractures in Minneapolis. I have asked to serve with me on this committee one member of the staff of each of the accredited hospitals and also a number of other surgeons who might be termed "free lances." Our meeting tonight and our meetings tomorrow are the first fruits of this organization, the Minneapolis Surgical Society having most graciously allowed us to co-operate with them.

We are fortunate in having here in Minneapolis a member of the General Fracture Committee of the College. A few weeks ago they met in Chicago. I take great pleasure in introducing Dr. Roscoe C. Webb, our local member of the general committee, who will report to us in brief on that meeting.

Report of Chicago January Meeting  
of the General Fracture Com-  
mittee of the American  
College of Surgeons

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The Committee on the Treatment of Fractures of the American College of Surgeons was established by the Regents of the College to promote interest and general improvement in this increasingly important branch of surgery. The great advances in the standardization of the other branches of surgery during the past forty years have so interested surgical teachers that until recently the teaching of fractures has suffered. The sad story of fractures is being constantly related before our industrial commissions, when the victim is so fortunate as to have had his accident while employed, and the permanent disability ratings granted and the computations of costs in money make up a large portion of the commission's reports.

The American College of Surgeons' Year Book contains the reports of the Committee on the Treatment of Fractures and you have no doubt noticed that the fundamentals such as the teaching of fractures in medical schools, the minimal equipment for hospitals, accepted treatments for certain common fractures, the organization of regional sub-committees, and similar subjects have been included in these reports. The committee functions through annual meetings of the committee, through sub-committees, and through regional sub-committees.

The annual meeting of the General Fracture Committee of the American College of Surgeons was held early in January of this year in Chicago, at the College of Surgeons building. The meeting was similar to our meeting now being held in that it covered two days and consisted of reports of committees combined with clinics at the University of Chicago by Dr. Plemister, and at the Presbyterian Hospital by Dr. Speed.

The Committee on Bone Plates and Screws reported the completion of their work for the present. Surgeons in various parts of the country had reported catastrophes resulting from the breaking of bone plates. Investigation showed that these were due to inferior material in the plates. This committee in conjunction with the United States Bureau of Standards has provided standards for manufacturers and certified plates and screws are now on the market.

The Committee on Medical Education in Frac-

tures gave the results of one of the recent questionnaires to medical schools and described the teaching in one of the larger eastern medical schools. In the first year the students receive four hours in instruction on fractures, two hours when the work of dissection on the upper extremity is completed, consisting of demonstration of prepared specimens with classical fractures with discussion of the surgical anatomy and the structures which may be injured, followed by illustrations with X-rays and clinical cases. A second similar two hours is given on completion of the dissection of the lower extremity.

In the second year a similar four hours are again given in connection with the studies in anatomy. Also in the second year, twenty hours are devoted to fracture healing and pathology in connection with the course in pathology supported by experimental work and clinical cases.

In the third year the students are advised to secure the A. M. A. Primer on Fractures and are given the American College of Surgeons Outline on Treatment of Fractures. Thirty-seven hours of instruction in fractures is given to small groups in the out-patient department and there are seven hours of instruction in the care of bed fractures.

In the fourth year there are fifteen hours of instruction on the wards in the bed treatment of fractures. In addition surgical clerks spend a few nights in the hospital to see the handling of acute fractures and an attending surgeon is required to come to the hospital for each case for the purpose of teaching initial diagnosis and treatment.

The Committee on Contact With the National Board of Medical Examiners reported that questions on fractures will be included in the examinations in surgery.

Ambulance equipment was also discussed and recommendations were made. It is probable that the ideal here will not be reached until all internes riding ambulances are thoroughly versed in the anatomical structures surrounding the fractures as well as the pathology, and will, as a result, become first-aid-minded, so to speak.

Physiotherapy was discussed and the opinion was expressed that early physiotherapy should be further developed.

Regional committees were reported upon and their further development was urged.

One session was devoted to work on revision of the Outline of the Treatment of Fractures which was published last spring. It is hoped that this volume can be published in an improved form in the near future.

The Committee on the Treatment of Fractures is now in the tenth year of its existence. The Minneapolis Surgical Society is now beginning its second decade. The co-operation of this society should insure much constructive work by the local committee in the care of fractures generally.

### The Teaching of Fractures in the Medical School Curriculum

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The impetus lent to surgery in its three greatest benefactors, anesthesia, asepsis and the Roentgen rays have widened tremendously the borders and increased the scope of surgery. These agents have likewise been a great boon to the better and more intelligent handling of fractures. Everywhere, however, one hears echoed the criticism that fracture treatment has not exhibited the uniform improvement long since manifest in many newer chapters of wound management. Many who are qualified to know and have given the matter serious study, say that fractures on the whole are badly managed.

Amongst other causes, one naturally seeks an explanation of this existing state of affairs in the curriculum of the medical school where the future practitioner establishes his first contact with the conduct of fracture cases. If one were to direct his inquiry concerning the teaching of fractures to the deans of our medical schools or subordinate officials more directly responsible for this subject, he probably would receive a fairly uniform type of answer. They would probably be the first to own that fractures like most other subjects in the curriculum do not receive the attention that the importance of the subject justifies. In event the interrogation came when the deans and their curriculum committees were brooding over contemplated increases in allotment of time to any of the divisions (a no small part of the deans' worries) and the utter futility of adjusting the curriculum to everyone's complete satisfaction was quite apparent, the apology concerning the inadequacy of instruction in fractures might be qualified to this extent: The chief office of the medical school is to equip the student with weapons with which he may intelligently approach his future problems. Medical training is a life-long process of education in which the young graduate has made only a start. The Medical School believes that if it has taught its students how to think that it has served its purpose well. We have sought to stimulate their interest and

arouse their curiosity but not to satisfy it. We have not made finished artisans out of our students but we have furnished each with tools with which through constant effort he may become practised in their use.

The advent of cellular pathology which has contributed in such large measure to our better understanding of disease processes has stimulated a great interest in normal as well as pathological microscopic anatomy with a consequent lessening of intensity of interest in applied anatomy. Our predecessors who were called upon to reduce fractures without the aid of anesthetics were far better schooled in the knowledge of muscle antagonists than we. They were intimately concerned with the art of obtaining relaxation of the muscles responsible for the deformity. Though anesthesia has modified the problem greatly, I am persuaded that a good grounding in applied anatomy is just as essential today in the management of fractures. A knowledge of the mode and extent of muscle pull, contributes definitely to a better understanding of the occurrence of fractures through the most frequent agency of indirect violence.

Zuppinger went to the anatomical laboratory in Zürich to investigate the force necessary to break the tibia by twisting. The laboratory "Diener" informed him that he had taken over a very difficult task. It was found that four men could not break the tibia in this manner even though the foot was twisted off at the ankle joint. Sir Astley Cooper relates that when Damien was executed for the attempt to murder Louis XV, four horses were fixed to his legs and arms, and repeated ineffectual forced attempts for over fifty minutes were made to tear his limbs from the body. In order to effect this dismemberment and extinguish the doomed man's life, the executioners were obliged to cut the muscles and the ligaments near the trunk. The agency of muscle pull determines in large measure the facility with which fractures are seen to occur. Dislocations and fractures are more readily sustained in life than after death.

At the University of Minnesota two formal required courses in fracture instruction are given; one is an objective course of eleven sessions, each of an hour and a half in length in which cases are shown demonstrating the particular varieties of fractures under discussion. This course is given to the Juniors, one division of the junior class being present each quarter. Two of the eleven weeks of the surgical clerkship offered to Seniors is spent solely on fractures. Both these courses are given under Dr. Zierold's supervision at the Minneapolis General Hospital where an abundant fracture material is available.

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Fracture instruction is also imparted, though in a lesser degree, in the courses of applied surgical anatomy, principles of surgery, regional surgery (orientation course), lectures on orthopedic surgery, the weekly clinics to Juniors and Seniors, the surgical out-patient clinic, and in ward walks with the surgical clerks by the hospital staff.

There exists a large mass of knowledge concerning fractures, but one can not escape the impression that this information is not as well crystallized as in other spheres of the surgeon's activity. The fundamentals of fracture treatment, viz., reduction, fixation, and assurance of good function need more emphasis. He who essays to treat fractures must learn to be the master of a method and not the slave of apparatus. Patients are not infrequently admitted to the hospital some days after the occurrence of a fracture with the note that the proper splint or apparatus was not available for handling it.

A stimulation of interest in fractures will undoubtedly contribute more to their better management than any other combination of factors. With an increased field of activity has come a lessened interest in fractures and a tendency on the part of accomplished surgeons to turn this time-consuming group of cases over to their less experienced associates. Surgery is not a province with fixed boundaries. With advances in knowledge, some diseases once dealt with almost solely by operation are found to respond better to more conservative means of treatment, while others for similar reasons are surrendered by the internist to the surgeon. That which is essentially mechanical, however, has always remained surgical. Wound surgery, of which fractures constitute an essential part, has ever been the surgeon's domain. Whether fractures will remain a field of activity for the general surgeon or be taken over in large measure by reprisal by the industrial or orthopedic surgeon, the general surgeon's interest will chiefly determine.

Fractures constitute so great a portion of the injuries and accidents that it is highly important that a large number of well-qualified individuals be prepared to deal with this important branch of surgery. The general practitioner has always been an important agent in the caring for fractures and his interest in an improved fracture program must be enlisted. In the care of those fractures in which the responsibility is great, he should be counselled to seek skilled aid in their management from the start.

The recent graduate casting about for a field in which to divert his interest and equip himself

by special training in surgery is not likely at present to become enthusiastic over fractures. He knows that the care of fractures demands constant attention and eternal vigilance and that the rewards of his labors in terms of hours spent are not great. He knows that his liability to a charge of malpractice is much greater in external injuries than when dealing with obscure internal complaints. Though mindful of the correlation between anatomical restoration and function, he sees juries placing undue emphasis upon the X-ray film. He hears of cases not settled on their merit but by debate in which physicians express seriously conflicting opinions over matters in which he sees little room for disagreement. He notes that unprincipled colleagues and unscrupulous lawyers will, for a fee, distort facts and confuse issues that lead to a decision in which he sees no justice, and may even prove his undoing.

Possibly, these are some of the evils that must be patiently tolerated temporarily, but which will, in the end, clear some of the barriers and bring about the reform that must take place before young men will lend themselves wholeheartedly and without prejudice to this important chapter of surgery.

### Fracture Teaching and Organization at the Minneapolis General Hospital

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The Minneapolis General Hospital has in its entirety approximately 768 beds available for the service of charity patients. Of this, the surgical service comprises approximately 150 beds. Of the surgical service some 50 to 90 beds are usually occupied by fracture cases. This constitutes a separate and distinct division of the surgical service and is administered and staffed as such. In the receiving wards there are 14 to 15 beds for such patients as require a short period of observation, but whose condition does not demand admission to the surgical wards. Added to this, the daily out-patient service admits the ambulatory cases for after treatment and physiotherapy.

The staff organization is of a chief and three associate attending men, alternating with a similar group at three-month intervals. Of the attending staff one man is assigned to the fracture service and with the chief, this constitutes the senior staff of the service. It will be necessary to go a bit more into detail concerning the fellowship teaching and staff to understand their service and duties. We have, at present, five teaching fellows

on the surgical service. At the end of six months we expect to have six. These are residents of the surgical service and are appointed for a period of three years. During the first six months of their residence, they are assigned to general surgical service with the duties of a first assistant and the responsibilities of the care of surgical patients. The second six-month period is spent on the fracture service, both in the hospital ward and in the out-patient department. During the third six months, the assignment comprises the orthopedic service and the receiving service combined. The fourth six months is made up of a similar receiving service combined with urology. At the beginning of his third year, the teaching fellow occupies the position of junior resident and is allowed to do minor surgery and such supervised operating as lies within their capacity as determined by the attending surgeon. During the last six months the teaching fellow, as senior resident, is permitted to do independent operating and to have the care of such cases as may be determined by the attending staff. During this last year, the junior and senior residents act as advisors and supervisors of the men who are their juniors.

The interne organization as applied to surgery is composed of four men on a rotating service. Two of these men are assigned to fractures, and with these two is another interne, who is on a straight surgical service and who remains for six months on fractures and six months on general surgery.

The receiving service is staffed by one of the senior fellows and one of the senior residents who has passed through his general surgical service and through his fracture service, and who has at his disposal such attending staff man as may be assigned to the service at that time.

The out-patient service up to recently has been cared for by teaching fellows, internes, and an assigned staff man. This will probably be changed with reorganization of the dispensary and the out-patient staff. The department of physiotherapy is in charge of a full-time physiotherapist, who cares for the patients within the hospital and such out-patient cases as require treatment.

Briefly, the fracture service is a distinct division staffed by the chief, associates, senior and junior fellows, and junior and senior internes.

The teaching of fractures to the students is undertaken both by lecture and by clinical demonstration. There are weekly lectures of one and one-half hour each in which bone injury, repair, methods of treatment of typical regional fractures, complications, and results are considered. These lectures are supplemented by individual

case records, X-ray examinations, and exhibition of illustrative cases. If the patient cannot be moved, the students are taken to the wards to inspect the case, its progress, and the manner of treatment. Following the completion of the assigned course of lectures, the student is assigned to a clinical clerkship devoted solely to fractures. This occurs during the senior year. During the time of a student's assignment, he is required to take case histories, make physical examinations, and observe and record the progress and treatment of his cases. Each day the student group is met by a staff man and some particular phase of fractures is taken up in the form of a clinical demonstration. Such fractures as are not hospitalized are seen by the student in the receiving ward and they are obligated to answer emergency calls as in other clerkships. Although no organized course of physiotherapy is given, an attempt is made to have the students observe the various forms and applications of physiotherapy. The surgical service, and particularly the fracture service, has been in a state of flux out of which is gradually crystallizing a definite organization. I feel that it would only be fitting at this time to express a most heartfelt appreciation for the work of Dr. Charles Remy as superintendent of the Minneapolis General Hospital. By reason of his understanding and capacity for organization and accomplishment, not only the physical equipment of the hospital, but the morale of the personnel is at a higher point than ever before. This has been supplemented by the co-operation of Dr. O. H. Wangenstein, chief of the Department of Surgery at the University of Minnesota, who has afforded us a generous number of teaching fellows of most excellent quality.

### Minimal Requirements of the Average Hospital for the Care of Fractures

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Frankly, I was somewhat astonished to be assigned this portion of the fracture symposium, for it is well known hereabout that since 1929 I have been an exponent of Böhler's ideas and work in this field. Therefore I may state at the outset that in my opinion the physical armamentarium of every modern hospital should include a complete set of fracture tools as outlined by Böhler in the second edition of his book on fractures.

In this country there is still some opposition to Böhler's methods. A certain group includes those surgeons who have tried to follow Böhler's in-

structions but have failed to get good results. The members of this group blame everything else instead of placing the blame on their own shoulders where it often belongs. This sort of thing usually happens after a new process or method has been launched. It is due to lack of understanding of the method or to lack of proper preparation.

Böhler has "standardized" as much as possible. It will never be possible to standardize completely the treatment of fractures, since no two cases are exactly alike. In evaluating a fracture we must not only take into account the lesion itself, but must consider the general condition of the patient; the presence of other traumatic lesions; the patient's age; his general habitus, and many other factors. Therefore, it is comparatively seldom that two cases are alike in every detail and therefore there are risks in attempting too much standardization.

Let us now briefly survey what a hospital should possess in order that it may consider itself able to cope with that painful, costly, and cripple-producing lesion, the fresh fracture:

1. *Gray Matter.* This is up to the staff. Without it armamentarium sent directly from heaven will not avail. Some of the qualifications of the surgical brain should be—

(a) Anatomy. Exact, definite knowledge of the extremities. Hazy, genial, generalized notions will not do. Accurate knowledge of easily forgotten, cold, hard anatomic facts is necessary.

(b) Knowledge of muscle and nerve physiology of the extremities. Also some knowledge of physics, especially the law of the lever.

(c) A "mechanical sense," either congenital or acquired.

(d) Ordinary "horse" sense (common sense).

A surgeon not equipped with these four attributes has no moral right to treat a fracture.

2. A Röntgen outfit situated near the plaster room. This should include a hospital manager, who does not shy at the cost of numerous and repeated X-rays. An additional portable X-ray outfit for bedside work is of great value.

3. A "plaster" room containing good plaster of Paris bandages (length, six yards; width, three to eight inches, preferably home made). This is much more easily said than done. It should include an intelligent male orderly, who prepares the bandages, lifts the patient, and makes himself useful in a thousand ways. In addition there must be white and buck felt, gauze and muslin bandages of varying widths, and a good quality of "sheet wadding" and cotton batting. This room should

further contain ordinary antiseptics such as alcohol, iodine, mercurochrome, etc. Also a few aspirating needles and trocars. Luxuries such as an anvil, a vise, a few files, machinist's hammer, pliers, monkey wrenches, drills, cutting pliers, screw driver, etc., are always welcome. A hook should be placed in the ceiling for Sayre's suspension apparatus. All of this should be stored in orderly fashion so that it may be easily found when wanted.

4. A good extension table of the Hawley or Albee type—with accessories.

5. Special apparatus. For the sake of brevity I will quote Böhler in extenso:

(a) A good bed. (I am sure Böhler would commend the bed of Dr. Archa Wilcox, of Minneapolis.)

(b) Leg screw traction apparatus.

(c) Arm screw traction apparatus.

(d) Leg rests. (Braun splints with variations).

(e) Arm rests. (Abduction splints—some American types are very satisfactory.)

(f) Wooden frame for fracture of femur (Balkan frame).

(g) Hip rest (on Hawley table).

(h) Bed pulleys (extension); iron weights; plenty of sand bags of assorted sizes; spare pulleys; rope of assorted sizes.

(i) Knee exercise frame (very simple).

(j) Ice tongs (we rarely use these).

(k) Rust-free wire and clamps (we prefer the Kirschner clamp). (Very useful.) Steinmann pins with Böhler stirrups to match.

(l) Cramer wire splinting (good material to have around).

(m) Böhler's clavicle splints (simple, new and efficient. We like them).

(n) Os calcis wrench (indispensable for fracture of this bone).

(o) Finger splints of soft wire (easily made at home).

(p) Iron stirrups for walking casts (easily made at home).

(q) Simple machinist's tools as outlined above under 3.

(r) Good adhesive plaster (both ordinary and elastic).

(s) Spreaders of various types.

(t) Bandage scissors. Heavy shears. Plaster spreader. Stille cast cutters.

(u) Masticol (indispensable).

(v) Novocain. Hypodermic needles and syringes. Sterile sponges, etc.

While I have not looked it up, I believe a hos-

pital of average size can nicely "Böhlerize" itself at an outlay of a few hundred dollars.

#### 6. Special apparatus continued.

In addition to the above, some simple metal gutter splints such as right angle elbow splints, right angle foot splints, posterior leg gutter splints, and simple wrist, cock-up, splints are serviceable.

The omnipresent Thomas and Jones splints, when correctly made and used, are always of value.

7. We will not discuss surgical instruments for the open reduction of fresh fractures (osteosynthesis); for the treatment of malunited or non-united fractures; for the care of compound fractures. Here the individual preferences of surgeons differ so much that, in justice, the average hospital cannot be asked to cater to these varied demands.

#### 8. In conclusion permit me to reflect that:

(a) Fractures can be, and have been, well taken care of with extremely meager physical equipment, if the surgeon possesses brains, training, ingenuity and mechanical fitness.

(b) The most luxurious mechanical contrivance will not by itself cure a fracture; it must be under the constant and intelligent control of the surgeon or of the orthopedic surgeon.

### The Equipment Necessary for the First-aid Treatment of Fractures

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My assignment assumes, I suppose, that I should speak of physical equipment. I prefer to go further back in the treatment of fractures, to the mental equipment primarily necessary in the treatment of our largest single industrial and machine-age accident result.

The old fashioned bone setter treated many serious fractures as well and often better, than some of us. They, at least, had instinct and mechanical sense on their side.

My contention is that all the physical equipment in the armamentarium of the most renowned fracture man is useless in the hands of a recent graduate, interne, country practitioner or general surgeon, without the fundamental mechanical sense which tells him how to utilize it. And, our specialists become dangerous when their armamentarium directs their method of treatment.

We have assembled here during these few days, not to improve ourselves alone, but to shape future policies with regard to fracture care in this district, with the hope that we may mould others

into the same line of thought. That means teaching, a thankless task. Of course we have our brilliant student who follows our lead, who looks up to us and adopts our ways (perhaps that is why we think him particularly brilliant), but the average student is not so. We must so teach and direct him that we develop a mechanical sense, a fundamental anatomical and functional understanding, and a stick-to-it-iveness that will follow his fracture through from the first aid to recovery. And one other thing, we must instill in him the realization that sometimes his physical and mental equipment cannot handle a particular case throughout, he must realize when he is over his head and should call for more competent help.

I regret that my work leads me to the above conclusion, not in a spirit of criticism, but rather in an attitude of facing the facts and trying to drive home this thesis, I cite the following:

The first fracture I saw in this city was a subtrochanteric fracture, treated first in a poorly fitting plaster spica, applied by a man who could not use plaster (the first lesson a fracture interne should learn and it takes at least a month of daily plaster work to do so), then by skin traction which was inadequate at four weeks when it was applied. Open reduction was done the day following removal of skin traction in the presence of blisters. The patient died of osteomyelitis and amyloid degeneration after months of suffering.

I recently saw Steinman pin traction applied to the os calcis for an old fractured shaft of the femur with two and one-half inches overriding. Luckily the pin broke before the ankle and knee ligaments. The patient now has Kirschner pin traction through the femoral condyles with satisfactory reduction.

A fracture of the surgical neck of the humerus recently came under my observation. The fracture is beautifully reduced but the patient has lost two-thirds of her elbow motion from a Steinman pin insertion in the olecranon process.

A base of the neck of the femur fracture in a man of 38 is now under my care with three and one-half inches overriding, and non-union because the spica was removed at seven weeks. The reduction was perfect, but the plaster had to be removed because check up X-ray showed the fracture had slipped in the plaster. Need I comment on that plaster?

A week ago I reduced an old Colles fracture with terrific deformity, which occurred in a man with a fracture of the neck of the femur. The Colles fracture was not recognized. The neck of

the femur was treated in a short leg spica, to above the knee.

I walked into an operating room where an old fracture of the femur was being operated upon for delayed union in malposition. Except for two or three periosteal elevators and curettes an appendectomy set up was all the equipment in evidence. And that surgeon, I know, knew better, he just didn't think. The case now has union, no shortening, but still malposition and a stiff knee.

These are extreme cases. I admit, but as I look back over them I know that they were avoidable if we, as teachers, and this includes you older men who taught us younger ones, administer firstaid in the class room, the anatomy laboratory, the clinics, and then on the street and accident floor where the physical firstaid of the fracture commences.

What then are these physical agents for use in the firstaid treatment of fractures. Let me enumerate them briefly.

1. The fracture-conscious interne.
2. Stretcher.
3. Warm blankets.
4. Tourniquet.
5. Sterile dressings and elastic bandages.
6. Four triangular muslin slings.
7. Four muslin bandages four inches wide.
8. Thomas ring splint for leg.
9. Thomas ring splint for arm.
10. Large soft pillows.
11. Basswood boards 30 by four by one-quarter-inch thick.
12. Safety pins.

Of all the above, the Thomas splint is by far the most important and most useful, the use of which every interne should thoroughly understand. In an attempt to impart some conception of its usefulness, Dr. Wallace Cole devoted two full periods of senior lectures to this subject alone.

"Do's:"

1. Treat shock by keeping the patient warm and stopping hemorrhage, preferably by compression bandages.
2. Use the tourniquet without hesitation if necessary.
3. "Splint them where they lie" without moving them about.
4. Use the Thomas ring splint for all fractures above the middle third of the lower leg and above mid shaft of the humerus using the wide muslin for applying traction as a sliding loop.
5. Use the pillow splint applied as a box splint for the lower leg and ankle fractures.
6. Use a double triangle sling for elbow and lower arm fractures.

"Don't:"

1. Hurry.
2. Be rough.
3. Forget your tourniquet.
4. Forget your fundamental anatomy and physiology.

I plead for mental equipment, applied anatomy, applied common sense, applied follow-up and teaching in our hospitals by those who by instinct

and training love fracture work and can so carry it out that it will prove an inspiration to our students, be they undergraduate or postgraduate like ourselves.

### Colles' Fracture with Special Reference to Factors Resulting in Impairment of Function

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Colles' fracture, as defined by the Fracture Committee of the American College of Surgeons<sup>1</sup> is a fracture "of the lower end of the radius, usually within less than one inch of the articular surface of the wrist joint. It is caused by a fall on the outstretched hand. The lower small fragment may be of various shapes and sizes and may be displaced in different directions. Usually this fragment is displaced backward and this particular displacement gives the appearance of a silver-fork deformity. The lower end of the upper fragment is often impacted into the small fragment. Backward rotation of the small lower fragment upon its transverse axis causes distortion of the articular surface of the radius. The ligaments of the wrist may be stretched and torn. The hand is abducted on account of the radial impaction and displacement, and the head of the ulna is prominent. The styloid processes of the radius and ulna no longer are at their normal levels."

Associated with the fracture of the lower end of the radius, one frequently finds a fracture of the styloid of the ulna; tearing of the ligaments and triangular fibro-cartilage between the radius and ulna; faulty position of the radius and ulna at the lower radio-ulnar joint; and poor position of the lower end of the ulna, due to the forward and downward thrust, tearing of the ligaments and shortening of the radius.

Reduction in cases with typical deformity may be accomplished by a variety of methods, such as, traction with hyperextension to break up impaction, forced flexion, making direct pressure over the lower radial fragment, and pronation. If the manipulative procedure has been successful, the obvious deformity which was present, will have been eliminated. Full flexion of the hand will be permitted unless limited by soft part swelling. The styloid of the radius and ulna will bear a more normal relationship and the lateral view (of the antero-posterior and lateral views taken after reduction) will show that the articular surface of the radius forms an angle of 90 degrees, or less, with the long axis of the radius. A small "V"

shaped defect on the dorsum of the radius is no cause for concern, for these usually fill in rapidly.

Position can be well maintained by anterior and posterior moulded plaster of Paris splints with sufficient padding, extending from the metacarpal phalangeal joint to a point on the forearm distal to the elbow, thus allowing free movement of the fingers and thumb. Splinting should be maintained for approximately four weeks, depending on the age of the individual and the tendency of the lower fragment to displace, as determined at the time of reduction. Careful movement of the wrist under the direct supervision of the surgeon (employing, if necessary, a slight downward pressure by the thumb on the lower radial fragment while the remaining fingers of the surgeon's hand support the forearm) in most cases can be instigated in ten days. The wrist should not be subjected to unusual strain until X-rays show a fairly firm union. Antero-posterior and lateral X-ray views should be taken before and after reduction and usually a third set is advisable at a later period, at about the time one is considering removing the splints. In the ordinary case that is about four weeks after the fracture. If there is any question about the union a fourth set should be taken prior to returning the individual to full use of the hand and wrist, usually at about the eighth week following the fracture.

Reduction is indicated in a vast majority of cases. Several points should be borne in mind in effecting reduction, both in regard to the manipulative procedure and in order to correct, as far as possible, conditions which will lead to impairment of function.

(1) The condition of the joint surface at the lower end of the radius is very important. If this joint surface is involved by the fracture but remains smooth and even, care must be exercised to avoid effecting any change which will create an uneven, irregular joint surface. On the other hand, if the joint surface is irregular, it is highly desirable to correct this condition as well as possible, as an uneven joint surface usually causes pain on movement with consequent impairment of function (see case 36).

(2) The inclination of the joint surface at the lower end of the radius<sup>2</sup> is also of great importance. This joint surface normally forms an angle of 75 to 80 degrees, with the long axis of the radius, that is, it faces downward and slightly forward. In most cases of Colles' fracture, due to the rotation of the lower fragment of the radius on its transverse axis, this joint surface faces downward and backward forming an angle with

the long axis of the radius varying between 90 to 125 degrees or more. This condition, if not corrected, usually leads to limitation of palmar flexion at the wrist joint and not infrequently to weakness and pain.

(3) The position of the lower fragment of the radius is of great importance as its position usually influences the inclination of the radial joint surface,<sup>3</sup> the relationship between the radius and ulna at the radio-ulnar joint, and the length of the radius.

(4) The position of the lower end of the ulna in relationship to the radius and carpal bones is frequently disturbed (usually thrust downward), thus limiting ulnar deviation of the hand at the wrist and establishing an abnormal relationship at the radio-ulnar joint; breaking up the impaction of the radius and restoring the normal length of the radius as well as possible, tend to overcome this condition combined with attempted reduction of the faulty position of the lower end of the ulna.

(5) The position of the radius and ulna at the lower radio-ulnar joint are of some importance as well as the ligamentous injury in this region. If the fracture line involves the radio-ulnar joint, early pronation and supination of the forearm should be instigated.

(6) The amount of ligamentous damage is undoubtedly of importance, but difficult to evaluate as a factor in the ultimate impairment of function. It has been my experience that in most fractures of this type, there is very little tendency to displace an exaggerated flexion and adduction has rarely been necessary. A somewhat neutral position of the hand would seem to be favorable to the normal healing of the ligaments.

With these points in mind, a tabulation was made (see table) of fifty uncomplicated Colles' fractures which have been examined for estimation of disability. Treatment in these cases was given by forty-eight different medical men. Impairment of function was estimated on general loss of usefulness, loss of movement, loss of strength, and so forth. Movement of palmar flexion, dorsiflexion, radio and ulnar deviation, were tabulated in these cases and a comparison made with a normal hand in judging the loss of range of movement. The grip was determined as registered on the dynamometer (grip machine). An allowance was made for estimated improvement with use in certain cases.

Antero-posterior and lateral X-ray views were taken in all cases and in many cases an oblique view was also available.

(1) The average disability estimated in the

No.	Age	Reduc.	Comp't	Radial Fragment (Lower) Joint				Ulna (Lower End)				Radio Ul. Joint		Grip	Dis. %
				Type	Inv.	Pos.	Incl.	Frac. of Sty.	Un.	Pos.	Pos. of L. E. U.	Inv.	Joint Str.		
1	23	Yes		Trans.	No	E.	85°	Avul. Tip	Yes	G.	E.	No	N	80	0%
2	27			Trans.	No	F.	100°	Yes	Yes	G.	F.	Yes	R&F1		25%
3	55	Yes	G. P.	Imp. Trans.	Yes	F.	104°	Yes	No	P.	P.	Yes	R&F2	55	35%
4			G. P.	Com.	Yes	V. P.	112°	Yes	No	P.	F.	No	N	25	20%
5	39	Yes	G. P.	Obl.	Yes	F.	85°	No	...	...	G.	No	N	55	0%
6	23			Imp. Com.	Yes	P.	110°	Yes	Yes	P.	F.	Yes	R&F2	2 3	15%
7	29		None	Trans.	No	F.	98°	No	...	...	G.	Yes	E		0%
8	50		G. P.	Trans.	Yes	F.	100°	No	...	...	P.	Yes	S&F2		10%
9	50		No Comp.	Trans.	Yes	F.	105°	Yes	Yes	F.	F.	No	E&F2	Normal	0%
10	45		G. P.	Trans.	No	G.	90°	Tip	Yes	G.	F.	No	E		10%
11	24		Left G. P.	Trans. Com.	Yes	F.	100°	Yes	Yes	G.	F.	No	F2	70	10%
12	24		Right No Comp.	Trans.	Yes	F.	100°	Yes	Yes	E.	F.	No	E	130	0%
13	58		G. P.	Trans. Obl.	No	P.	102°	Yes	Yes	G.	P.	No	F2	55	15%
14	48	Yes	R. P.	Trans.	No	P.	120°	No	...	...	P.	No	F3	0	25%
15	66		G. P.	Trans. Imp.	Yes	P.	120°	Tip	Yes	G.	P.	Yes	R&F3	35	25%
16	73		G. P.	Trans.	No	P.	110°	No	...	...	P.	No	F2	55	25%
17	16	Yes		Trans.	No	F.	95°	No	...	...	P.	No	F3	70	20%
18	34			Trans.	No	F.	77°	No	...	...	P.	No	F2	45	5%
19	40	Yes	G. P.	Obl.	Yes	F.	92°	No	...	...	F.	No	N	35	35%
20	19		G. P.	Trans.	No	G.	90°	Tip	Yes	G.	G.	No	N	50	0%
21	57	No	G. P.	Trans.	No	G.	82°	Tip	Yes	G.	E.	Yes	N&E	20	0%
22	65		G. P.	Trans.	No	P.	115°	Yes	Yes	G.	P.	No	R&F3	35	35%
23	35		G. P.	Obl.	Yes	F.	100°	Yes	No	P.	P.	No	E&F2	20	25%
24	64	Yes	R. P. & U. P.	Trans.	No	F.	92°	Yes	No	P.	P.	Yes	R&F3	55	25%
25	46	Yes	G. P.	Trans.	No	P.	107°	No	...	...	F.	No	E&N	40	15%
26	48		R. P. & U. P.	Obl.	Yes	F.	95°	No	...	...	F.	No	E	90	10%
27	19			Trans.	Yes	G.	85°	No	...	...	G.	No	E&N	50	0%
28	37	No	G. P.	Obl.	Yes	P.	110°	No	...	...	P.	Yes	R&F2	40	35%
29	41		G. P.	Obl.	Yes	F.	90°	Yes	No	P.	P.	Yes	R&F2	45	10%
30	42			Trans.	No	P.	110°	Yes	Yes	F.	F.	No	E&F1	40	15%
31	35	Yes	Right G. P.	Obl.	Yes	F.	90°	No	...	...	G.	No	E&N	35	5%
32	35	Yes	Left G. P.	Com.	Yes	F.	95°	Yes	Yes	G.	F.	Yes	R&F2	0	30%
33	70	Yes	G. P.	Trans.	No	P.	110°	Yes	No	...	P.	Yes	R&F3	40	15%
34	30		Left G. P.	Trans. Com.	Yes	P.	105°	Tip	No	F.	F.	Yes	E&F3		25%
35	30		Right G. P.	Trans.	No	F.	95°	No	...	...	P.	No	E&F3		25%
36	38	Yes	G. P.	Obl.	Yes	F.	90°	No	...	...	F.	No	N	30	30%
37	45		G. P.	Trans.	No	F.	107°	Chip	No	P.	F.	Yes	R&F2	5	35%
38	24	No	R. P. & U. P.	Trans.	No	P.	115°	Chip	No	F.	F.	Yes	E&F2	65	10%
39	45	Twice Yes		Trans.	No	F.	100°	Yes	Yes	G.	G.	Yes	E&N	60	10%
40	18	No	G. P.	Trans.	No	G.	90°	Yes	Yes	G.	G.	Yes	E&N	45	0%
41	32		G. P.	Imp. Com.	Yes	V. P.	115°	Yes	Yes	P.	V.P.	Yes	F3	110	25%
42	22	No	G. P.	Trans.	No	F.	107°	Yes	Yes	G.	G.	No	E&N	65	10%
43		Yes	G. P.	Com. Trans.	Yes	P.	105°	Yes	Yes	F.	P.	Yes	R&F3	35	15%
44	52	Yes	G. P.	Trans.	No	P.	125°	No	...	...	P.	Yes	E&F3	55	20%
45	53	Yes		Obl.	No	F.	92°	Yes	Yes	G.	F.	Yes	R&F1		0%
46	26		G. P.	Obl.	Yes	G.	75°	No	...	...	G.	No	E&N	15	0%
47	52			Com. Trans.	Yes	P.	105°	Yes	Yes	F.	F.	Yes	R&F2	20	10%
48	32	Yes		Trans.	No	F.	95°	Yes	Yes	G.	F.	Yes	R&F2	75	10%
49	50	Yes	G. P.	Trans.	No	F.	105°	No	...	...	P.	Yes	R&S&F3		0%
50	45	Twice Yes	G. P.	Trans.	No	P.	70°	No	...	...	P.	Yes	R&F1	55	10%

## REMARKS

## CASE No.

1. Excellent result.
2. Disability partly due to position of ulna and R. U. joint.
3. Disability largely due to condition of L. E. of radius.
11. Position of ulna apparently large factor.
13. Partial median nerve injury (slight).
19. Radio-carpal joint rough.
24. Arthritic change in the wrist.
33. Styloid missing; apparently absorbed.
35. Nearly all disability due to faulty position of the ulna.
36. Radial carpal joint surface is rough—otherwise good—but notice dis. is high and this is the only case with an angle of 90° or less where the dis. is high.
39. Reduced once under local and once under gas.
41. Grip of left hand 160°.
43. Operatively treated.
46. Grip on right is 55.
50. Reduced twice under general anesthesia—immediately following injury, second time eight weeks following (over corrected).

## KEY TO CHART

## COLUMN

1. NUMBER—Serial number.
2. AGE—Refers to the age of the individual.
3. REDUC.—YES signifies that fracture was reduced or reduction was attempted (records incomplete in this respect). NO means that no reduction was attempted.
4. COMPLT.—Refers to complaint of the individual with regard to pain and, wherever possible, the pain is localized according to the following table: U.P.—Pain over the lower end of the ulna; R.P.—Pain over the lower end of the radius; R.U.—Pain referred to the radio ulnar joint; G.P.—Generalized pain in the wrist joint.  
General head of:
5. RADIAL FRAGMENT (LOWER) TYPE—Refers to the type of fracture such as:  
IMP.—Impacted.  
COM.—Comminuted.  
TRANS.—Transverse.  
OBL.—Oblique.  
JOINT INV.—Signifies whether or not the radial carpal joint was involved, Yes or No.  
POS.—Refers to the position of the fragment, especially at the fracture line, that is, the relative position between the upper and lower fragment. Graded as follows:  
E—Excellent.  
G—Good.  
F—Fair.  
P—Poor.  
V. P.—Very poor.  
JOINT INCL.—Normally the lower end of the radius forms about a 75 to 80° angle with the long axis of the radius. If the angle is marked 90°, it signifies that the shaft of the radius and the lower articular surface of the radius form an angle of 90°. 110° would indicate that the radial joint surface faced downward and backward 20°.  
General Head of:
6. ULNA (LOWER END), FRAC. OF STY.—Refers to the styloid of the ulna. This column signifies whether it was broken, Yes or No.  
UN.—Signifies whether or not union occurred, Yes or No.  
POS.—Refers to the position of the styloid of the ulna (graded).  
POS. OF L. E. U.—Refers to the position of the lower end of the ulna (graded).  
General Head of:
7. RADIO-ULNAR JOINT, INV.—Indicates whether or not this joint was involved in the fracture, Yes or No.  
JOINT SUR.—The joint surface is graded as follows:  
N—Normal.  
S—Separated.  
R—Rough.  
E—Even.  
F—Faulty articulation, grades 1, 2, 3, 4, usually due to downward displacement of the lower end of the ulna as compared with the radius.
8. GRIP—Where determined on the grip machine, a normal grip usually falls in the neighborhood of 110°, slightly more to the right hand in a right handed individual and slightly less in a left handed individual.
9. DIS. %—Refers to disability estimated of the hand and wrist, based on loss of movement (not tabulated here on account of space), loss of strength and general loss of usefulness.

fifty cases based on the loss of use of the hand and wrist, was 14 $\frac{2}{5}$  per cent.

(2) In thirty-seven of these cases (74 per cent), the angle between the radial articular surface and the long axis of the radius was over 90 degrees (the radial joint surface faced downward and backward to a certain degree), showing imperfect reduction in 74 per cent.

(3) In thirteen cases (26 per cent), the angle of the radial articular surface and the long axis of the radius was 90 degrees, or less, showing a reduction of 26 per cent.

(4) In twelve cases (24 per cent), a negligible disability (no disability) was present.

(5) The fracture line involved the radial articular surface in 23 cases (46 per cent), and the average disability in these cases was 16 $\frac{1}{3}$  per cent (but slightly higher than the average disability which was 14 $\frac{2}{5}$  per cent).

(6) In four cases (eight per cent), the radial joint surface was uneven and the average disability in these cases was 20 per cent.

(7) In seven cases (14 per cent), the position of the ulna and the radio-ulnar articulation was not good, otherwise, the findings were fairly satisfactory. These cases averaged a 15 per cent disability or about average disability.

(8) In twelve cases (24 per cent), the position of the lower fragment of the radius was distinctly bad (angle between the articular surface of the lower end of the radius and the long axis of the radius 110 degrees to 125 degrees) and these cases showed an average disability of 22 plus per cent.

(9) On the other hand, thirteen cases (26 per cent), in which a good reduction of the radius had been accomplished, that is, the angle between the articular surface of the radius and the long axis of the radius was reduced to between 90-75 degrees (and in one case which was over-corrected to 70 degrees), showed a disability of five plus per cent. Seven of these cases had no disability. Disability estimated in this group would have averaged approximately three per cent had it not been for one case in which a 30 per cent disability was present due to the rough radial articular surface (see case 36).

## CONCLUSION

(1) Colles' fractures are not being efficiently reduced.

(2) Fractures of this type, reduced so that the angle of the articular surface of the radius and the long axis of the radius form an angle of 90 degrees or less, will average about five per cent loss of function to the hand and wrist.

(3) Fracture of this type where the angle is 110 degrees to 125 degrees will average approximately a 22 per cent disability to the hand and wrist.

(4) An uneven radial articular surface frequently leads to a high disability, but the fact that the fracture line involves the radial articular surface, does not necessarily give a poor prognosis unless the joint surface is uneven.

(5) Fracture of the styloid of the ulna, apparently plays but little part in the end result, except in an occasional case.

(6) The position of the ulna, the condition of the lower radio-ulnar articulation, and injury to the ligaments are conditions which should be kept in mind and corrected if possible, but are not the most important factors in determining the ultimate result.

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### Treatment of Fractures of the Vertebrae

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Being a part of this large fracture symposium, the time allotted to me by the committee permits only a brief resume of the subject.

The incidence of fractures of the vertebrae apparently has increased during the past few years due largely to the increase in automobile accidents,<sup>1</sup> but also to the more general use of X-rays in diagnosis. All fractures of the vertebrae obviously cannot be treated by the same method, and while each case must be considered individually, nevertheless the principles of modern treatment are becoming somewhat standardized.

The treatment of fractures of the vertebrae begins on the spot where the accident occurs, when the real nature of the injury is only suspected. This initial part of the treatment is often vital to the patient, yet it is administered by fellow-workmen or first-aid workers. Orthopedic surgeons believe that every case of back injury should be carefully X-rayed. In addition to this, I feel that every case of back injury should be transported face downward, and should be kept in the prone position until seen by the surgeon. In this way further damage is avoided and deformity may even be reduced during transportation to the hospital. First-aid workers should be

taught: "*Transport back injuries face downward.*"

#### I. FRACTURES OF THE CERVICAL VERTEBRAE

(a) *Vertebral Bodies*. The high mortality of these cases has perhaps overemphasized "expectant" treatment in the past. In cases *without cord injury* manipulation, traction, immobilization, and support are indicated. Probably the best device for simultaneous traction and complete immobilization is that recently presented by Brisgard<sup>2</sup> which consists of a plaster of Paris collar-jacket (Minerva type) applied in a sling or horizontal traction, into which canvas straps are incorporated for attachment to the head of the bed. When the head of the bed is elevated the body weight of the patient provides constant traction, thus eliminating troublesome weights and pulleys as suggested by Böhler.<sup>3</sup> This is similar to the method advocated by Christopher.<sup>4</sup> Traction should be continued until all muscle spasm is relieved, and should be followed by absolute immobilization for three to four months. Some efficient orthopedic support, such as the Schanz or Thomas collar, should then be worn until consolidation is complete. Fractures of odontoid process<sup>5</sup> require longer protection because of the danger of exitus in coughing or sneezing.

In cases *with cord injury*, the mortality is 81 per cent<sup>6</sup> and the question of laminectomy must be considered at once even though the advisability of this operation is still disputed. The prognosis in these cases is very grave, and the results of operation are not brilliant, but often laminectomy offers the only *possibility* of improvement. It is definitely indicated if the paralysis is only partial, or did not obtain instantly.<sup>7</sup> The Queckenstedt test is of value in these cases, to demonstrate complete block, or increasing block due to hemorrhage or edema. Naffziger<sup>8</sup> has presented experimental and clinical evidence indicating that delayed operations offer less help than those performed in the first few hours. In cases with complete block laminectomy should be done promptly,<sup>9</sup> if at all, for the prolonged pressure of fragments may convert a temporary block into a permanent one.<sup>10</sup> The final decision to operate should rest, not with the surgeon, but with the patient, or his relatives, after the facts have been explained.

(b) *Laminae and Spines*. Fracture of the cervical laminae with X-ray evidence of bone encroaching on the spinal canal should have laminectomy early according to Boorstein;<sup>10</sup> Scudder, Böhler, and others are of the same opinion. Fractures of the spinous processes often unite by

fibrous union and, if painful, they should be excised.

## II. FRACTURES OF THE THORACIC VERTEBRÆ

(a) *Vertebral Bodies*. Expectant treatment is no longer justifiable in compression fractures of the dorsal spine *without cord injury*, providing deformity exists. Angular deformity is progressive due to continued absorption. Davis,<sup>11</sup> in 1925, began to correct the deformity in these cases as in any other fracture. His method is now widely employed by orthopedic surgeons all over the world. Under general anesthesia Davis partially suspended the patient by the heels with his face downward in order to hyperextend the spine, then he made a downward thrust on the gibbus to disengage impaction, reduce dislocation, and correct alignment. After this manipulation the patient was immobilized in plaster shells for seven weeks; next, a Taylor back brace was applied, and the patient usually returned to work in four months. Dunlop and Parker<sup>12</sup> carried this further and added traction simultaneously. Schneck,<sup>13</sup> of Vienna, Böhlerized the Davis method, employing local anesthesia for a similar manipulation.

Watson Jones,<sup>14</sup> of Liverpool, has presented the best and most rational improvement on the notable work of Davis. He found that the body weight alone was sufficient to reduce these fractures, and used simply an opiate without anesthesia. The patient is supported face downward by the thighs on the end of one table, with his arms resting on the end of a second table about two feet higher; hyperextension and reduction of deformity are accomplished in a few moments by the sagging of the spine. A snug-fitting plaster jacket is applied to the patient in this position and walking is permitted in ten days. Protection is used for four months while exercises are given, then support by a light brace, and the patient is returned to work in about six months. Support is necessary while the bone is soft, and until its architecture is restored. The ambulatory method appeals to me because it favors free circulation, and restores the morale of the patient quickly. It is also less expensive and should dispel the notion that "broken backs never walk again," or never return to work. I have seen Watson Jones' work, and have used his modification of the Davis method with great satisfaction. Any of these methods, which correct the deformity immediately, is superior to gradual correction by means of the convex frame, and similar devices.

In the light of this work it is not unlikely that

many cases diagnosed Kummell's disease in the past, have been cases of compression fracture in which spontaneous reduction occurred, with subsequent collapse due to lack of immobilization and support.

Osgood<sup>15</sup> has reminded us that postural correction is what relieves pain in these cases. He and other orthopedic surgeons<sup>16</sup> advocate fusion operations in cases of long-standing pain and disability; operation being justified<sup>17</sup> if signs and symptoms do not steadily improve. Fusion certainly minimizes the danger of rarifying osteitis and lessens the period of disability. Certainly few cases *require* fusion operations, and few have much permanent disability; but some cases do *not* return to work in less than a year, and some never return to heavy work. There is danger of supporting some types over too long a period, giving rise to troublesome complicating spondylitis, or aggravating "pre-existing dormant spondylitis." Immediate reduction of the deformity should do much to eliminate this evil. On the other hand, if the compression of spongy bone is severe, and recumbency is to be enforced three months or more, the fusion operation, in competent hands, offers the assurance of making healing more certain. Personally, with a severe crush fracture of a dorsal vertebra, I should choose the Watson Jones manipulation, followed by a fusion operation, if a trained orthopedic surgeon were available for the work. Then a snug-fitting plaster jacket for three months, with a light brace to insure postural correction and protection for an additional six months. We have had a case return to heavy work in nine months, without permanent disability after this type of treatment.

With the milder types of fracture in which some weight bearing surface remains intact, the Watson Jones treatment alone should be sufficient, permitting walking after ten days. However, as Eikenbary and others affirm, complete healing requires six to eight months.

In compression fractures of the thoracic spine with cord injury, the same principles hold, in general, as in the cervical region. With complete paralysis obtaining instantly, the prognosis is grave for complete recovery, although sometimes such patients can be made ambulatory and even economically independent by orthopedic apparatus.<sup>18</sup> Special nursing care must be given these cases to prevent decubitus ulcers, cystitis, and contractures. Where the paralysis is only partial, or gradual in onset, laminectomy is always justifiable if not definitely indicated. Such cases can

be made no worse by laminectomy done carefully and thoroughly by competent hands, and many improve partially while some recover completely. In partial lesions it is perhaps advisable to wait one or two weeks after reduction of deformity. The Queckenstedt test may be of great service in these cases. Progressive paralysis, or X-ray evidence of bone encroaching on the spinal canal, warrants laminectomy.

(b) *Fracture of Laminae and Spinous Processes* should be handled as in the cervical region.

### III. FRACTURES OF THE LUMBAR VERTEBRAE

(a) *Vertebral Bodies*. Crush fractures of the lumbar vertebrae *without nerve injury* should be treated as in the dorsal region. In cases *with nerve injury* below the first lumbar vertebra, however, laminectomy is imperative, because the nerves of the cauda are virtually peripheral nerves, capable of regeneration when relieved of pressure. The operative results are best in this area, especially after the Queckenstedt test, according to Adson.<sup>19</sup>

(c) *Fractures of the Transverse Processes*. Kennedy<sup>20</sup> believes that the disability of these fractures is "due solely to the associated contusion or sprain, and the presence of fracture is negligible as far as prolongation of disability is concerned," and certainly this seems reasonable in cases occurring by direct violence. Bony union does occur in these cases, occasionally with exuberant callus and enough nerve involvement to warrant excision. Sometimes these injuries are diagnosed traumatic neurosis until the fracture is found, and in some the knowledge of "fractured spine" probably produces the traumatic neurosis. The frequency of traumatic neurosis in these fractures warrants withholding the diagnosis of "fractured spine" from the patient, in certain circumstances according to Kennedy, on account of the mental effect on the patient. No treatment other than rest in bed for two weeks is needed ordinarily, as the majority return to work within two months with no permanent disability. Böhler has found it necessary to excise the fractured transverse process of the fifth lumbar in some cases to gain relief from pain. Hartwell<sup>21</sup> found the average period of disability to be twenty-five weeks, but Kennedy's series places this as a maximum.

### IV. FRACTURES OF THE SACRUM

Fractures of the sacrum are usually vertical and heal after manual reduction, rest in bed, and strapping, without permanent disability. Trans-

verse fractures, however, may be complicated by sacral plexus damage.

### V. FRACTURES OF THE COCCYX

These fractures are common and troublesome. If seen early, manual reposition of the fragments is indicated, followed by strapping, and protection with rubber ring cushions. Excision is indicated in severe cases, or those having persistent pain.

### CONCLUSIONS

1. Any back injury may be a fracture, therefore X-rays are of paramount importance.
2. Back injuries should be transported face downward.
3. Deformity in crush fractures of the vertebrae can and should be reduced as in other fractures.
4. In cases of fracture of the spine with complete paralysis, laminectomy may be indicated in the cervical region, is usually indicated in the dorsal region, and is always indicated in the lumbar region.
5. Most orthopedic surgeons are agreed that fusion operation offers relief in cases of long standing pain and disability after a compression fracture of the body of the vertebra.

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## Fractures of the Hip

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Fracture of the neck of the femur may occur at any age, but is essentially one of adult life and more common in women than in men. It constitutes about one-third of all fractures in persons past 70. It has been in the past, and still is, a fracture which has caused all of us much concern, because of the large number of failures to obtain union even by the best known treatment and care.

The weakest part of the femur is the neck. Nature has, however, re-inforced the neck, not only by its shape, but also by its bony construction with trabeculae to withstand pressure in most needed lines. The head receives its blood supply through a vessel in the ligamentum teres and by circulation in the cancellated structure of the bone. In advanced years the vessels in the ligament practically disappears and the head of the bone must depend almost entirely on its blood supply from the spongy tissue of the neck. It is this lessened blood supply, with an attendant rarification of the bone, due to advancing age that makes this fracture possible, and so often prevents union from taking place.

Fracture of the neck of the femur may occur near the head, through the neck itself, and at the base of the neck, from which the fracture line may extend into the trochanters. The fracture will ordinarily be found to extend through the narrow portion of the neck and at the base of the neck.

I shall not attempt to discuss the anatomy of

the hip nor the causes of the fracture in this short paper, but will only review the cardinal symptoms, prognosis and treatment, for fractures of the neck of the femur.

The symptoms of a fractured hip consists of first, pain over the hip itself, pain in the groin, which is usually severe and which may radiate downward over the inner portion of the thigh to the knee. The foot is everted and the entire leg is rolled out. In a few cases there will be inversion, due to the fact that there is greater destruction of the anterior portion of the neck. The leg is shortened and the trochanter presents itself above Nelaton's line. The fascia is lax, and the patient is unable to raise the leg from the bed. When such a picture presents itself, the diagnosis of a fractured hip is evident. A fracture of the neck of the femur may occur, however, without any objective evidence of deformity, and with the only symptom, that of pain about the hip.

A person may fracture a hip and still be able to walk about, but with a painful limp. It is always advisable in any severe injury to the hip to have X-rays made, preferably stereoscopic films to determine a diagnosis. X-rays should be made before any manipulations are attempted and a thorough study of the films must be done, as even on excellent films a line of fracture can be overlooked. If a fracture does occur, and has not been recognized, and the patient is allowed to be about, a breaking down of the fracture line may occur and a definite deformity may result. It is always well to suspect a fracture in elderly people following an injury to the hip, until it can be definitely excluded by examination and X-ray findings.

Fracture of the hip in old people may produce considerable shock, and occasionally may bring about death in a very short time. The fracture itself with proper treatment will unite in most instances when the fractured ends are impacted, and in a large number of the unimpacted fractures which are treated by the abduction method, especially if the ends have been artificially impacted. Fractures at the base of the neck heal much more readily, due to the fact that the fracture line extends usually to the outside of the capsule, where the blood supply is more abundant. The nearer the fracture is to the head the less chance of union will be had. There is no such thing as delayed union. If at the end of four or five months no union is present, none will occur.

The abduction treatment, devised in recent years, has aided in bringing about complete re-

covery in a large number of fractured hips. Even with only a fibrous union, patients will frequently recover and be able to get about with only a slight limp. X-rays made in six months to a year after fracture, will show bony union in only about five or ten per cent of the cases, but a good functional result will occur in from 50 to 60 per cent of cases treated by this method.

The mode of treatment to be used in fractures of the hip must be governed by the condition of the patient, and the care that can be given the patient after an appliance has been used. An impacted fracture, without displacement, will need no further treatment than rest in bed with the entire leg properly supported and with a Bucks extension of possibly five or ten pounds. The aged will need much bodily and mental care. We all know that old people thrive on activity, but decline rapidly when put to bed for long periods.

Probably the most satisfactory method of treatment we have today, is the abduction treatment devised by Whitman. It is true that many fractures do not unite even with this method, but it is generally recognized as the method of choice up to the present time. It should be used in most cases and in practically all of the young and middle-aged, where the bones are impacted with deformity or where they are unimpacted. It should be used only in the hospital or in a home, where added nursing and care can be given to avoid complications.

The reduction of the fracture by the abduction method is, as a rule, not difficult. The patient is placed on a fracture table with the sacrum resting on a pelvic support. A perineal bar is used for counter pressure. The extended limbs are supported by two assistants. The patient having been anesthetized, one of the assistants now abducts the well limb to its normal extent to serve as a guide and to fix the pelvis. The injured leg is now lifted forwards, then rotated inwards and with a firm pull on the leg, is brought down to its normal length. The extended leg is then abducted and brought out to a position corresponding with the abducted well leg. The leg should be in complete extension with a slight flexion at the knee for comfort. The object of this treatment is to obtain an exact apposition of the fragments and to maintain them in position by some support. This is best accomplished by a long spica-cast. A cotton union suit with a liberal padding of preferably felt over the sacrum, pelvis and chest should be used. The cast is then applied and an assistant holding the leg in full extension, and abduction, and with the foot

turned slightly inward. The plaster should extend from the toe of the injured leg to the nipple line of the chest, and should be heavy enough or reinforced to prevent breaking. A window is made over the abdomen and the cast is trimmed around the pelvis to allow free movement of the well leg and to make the cast more comfortable.

X-rays should be made after reduction and application of the spica-cast. The films will usually show the fractured bones in good position. The cast is allowed to remain for two or three months. The position of the patient should be changed frequently, and for part of the day should be turned over completely to lie on the abdomen. Rigid cleanliness and care to avoid pressure sores must be enforced. After removal of the cast passive motion and massage is instituted and the patient allowed more freedom while in bed. If union seems firm he is then allowed in a wheel chair, and later on crutches, but no weight bearing is permitted for at least six or eight months.

Occasional X-rays should be made to check the position of the bones. Frequently the patient loses weight and the cast does not fit snugly, and at the end of four or six weeks a film will disclose an absorption of the neck with a marked coxa-vara. If this occurs the cast should be removed and the leg treated by a Buck's extension with abduction. A fibrous union will probably occur but with deformity. A double spica-cast may be used in the abduction treatment, but when it is used should only involve the well leg to the knee and should extend only onto the abdomen, fully supporting the pelvis.

Cotton has devised a method of artificial impaction, which is often of distinct help. The same manipulations are made as in the Whitman method, but in addition, just before applying the spica, a felt pad is placed over the greater trochanter of the affected hip and a heavy following blow is struck over the trochanter with a wooden mallet, weighing from six to eight pounds. One blow is usually sufficient and a definite yielding can be felt as impaction occurs. The cast is now applied in the manner of Whitman. Cotton states that he has used this method in a case, which had remained unimpacted for seven months, obtaining union by this method. He advocates the removal of the cast at the end of two months and protected weight bearing at the end of three months, with full weight bearing, in from six to eight months, depending of course, on X-ray findings and the general condition of the patient.

Open operation for fractures of the neck of the

femur, such as fixation with nails and bone pegs, may be done in late cases with occasionally excellent results. Open operation should, however, be only attempted in a well equipped hospital and by one thoroughly skilled in bone surgery.

#### CONCLUSION

The abduction spica-cast fixation is a distinct advancement in the treatment of fractures in the neck of the femur. It is the method advocated by the Fracture Committee of the American College of Surgeons after much discussion and study. The improved results obtained surely makes it the method of choice in the majority of hip fractures. In the treatment of the aged sound judgment should always prevail. A grandmother or grandfather alive even if disabled may bring much happiness to their children and grandchildren, where their passing at the expense of a good surgical result will often bring only trouble and sorrow.

### Carpal Bone Injuries

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When one reflects upon the use of the hand, wrist and forearm in people engaged in manual labor, in the carrying out of all trades and professional work, which groups include at least 95 per cent of persons engaged in earning a livelihood, one then realizes the importance of giving these parts of our anatomy considerable study, especially as to treatment, looking toward a minimum of deformity, loss of strength and limitation of motion. Any other member of the body or organ of special sense can be sacrificed with less resulting permanent disability.

Kaveland has stressed the importance of proper treatment of hand infections and has aroused general interest in that respect. But it seems to me that fractures in general and fractures of the carpal bones in particular, have been neglected by the general medical profession to a shameful degree.

Before the advent of the X-ray, injuries to the carpal bones went unrecognized and almost untreated, the supposed pathology being covered by that convenient blanket term, sprain. Even for a time after the X-ray came into use, such conditions as dislocation of the semilunar bone and chip fractures of the scaphoid went unrecognized, or their importance was so minimized as to call for little or no treatment.

The importance of dislocation and fracture of the carpals has recently been stressed more and

this has been forced upon us, in a large degree, by the insistence of industrial insurance companies that a minimum amount of permanent disability result from such injuries.

In 1922, after having seen three cases of dislocation of the semilunar bone, I had the literature reviewed back to 1890 and I searched the records of the Minneapolis General Hospital back to 1916. There was no record of a case being treated there between 1916 and 1922, and but 14 cases were reported in the literature between 1910 and 1920, and but 50 cases had been collected by von Frisch previously.

This condition which is sometimes associated with a fracture of the same bone or a fracture of the scaphoid can be missed unless a lateral view of the wrist is taken. It usually results from falling on the hyper-extended hand, the weak dorsal ligament being torn and the bone fractured or dislocated, or both, by being pinched between the end of the radius and the os magnum. It is forced forward out of position usually without the strong volar ligament being ruptured. As this occurs the entire weight is then borne by the scaphoid and this also is frequently fractured.

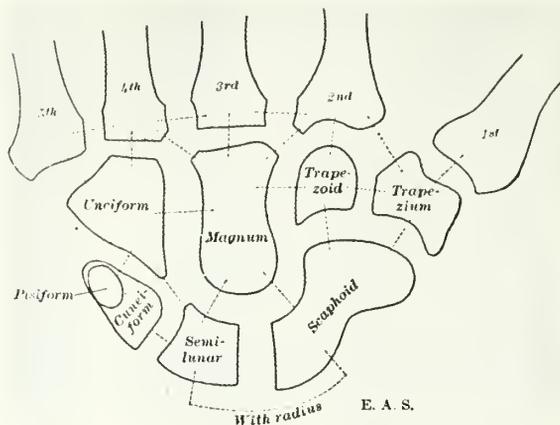
There are three things that can be done for this condition. *First.* If seen within 24 hours after injury, the bone can be manipulated back in position under the fluoroscope, by first hyperextending the hand and pressing on the semilunar with the thumb of the right hand. As this is being done, the hand should be slowly straightened on the arm. The bone can then be felt to slip back in its proper position and can no longer be palpated in the wrist. *Second.* If there is considerable swelling of the wrist and the dislocation is several days old, it may be replaced by making a volar incision through the skin and superficial tissues and, when the bone is exposed sufficiently to be felt, it can be manipulated back into place in the same manner as has been described. *Third.* If the volar ligament has been torn and the bone widely displaced, excision is indicated.

The most important injury in the carpal region, because of its frequency as compared with other injuries there, is fracture of the scaphoid.

Fractures of the body of the scaphoid or navicular bone, like fractures of the middle third of the tibia, are notoriously slow to heal and sometimes do not heal by bony union. Most fractures are through the neck of the bone but in others the plane of the fracture passes more toward the medial side, so that the bone is divided into a smaller proximal and a larger distal fragment.

There may also be a fracture of the tuberosity of the bone, but this type is rare.

The mechanism of fracture of this bone is not always the same, but the most frequent is by force of indirect violence from falls on the dorsally flexed hand. Bearing in mind the position of the scaphoid, which interferes with a direct transverse articular line between the two rows of



This diagram shows the various articulations of the wrist. If the midcarpal joint line is continued through the scaphoid it would bisect it. This explains why that bone is so frequently fractured when there is a row on row dislocation of the carpals.

carpal bones, it may be considered as belonging to both rows. If the wrist is flexed or extended, the second row of carpal bones makes an angle with the first row, and the scaphoid, in attempting to accommodate itself to both rows, is broken across the line of the midcarpal joint by the strain.

This mechanism is verified in those cases of midcarpal dislocation and fracture of the scaphoid in which the proximal fragment remains with the first row and the distal fragment is displaced with the second row. Fresh fracture through the body shows a line of separation, as in ordinary transverse lesions of bone, but the older cases have been subjected to absorption of the cancellous portion by the influx of synovial fluid and the irritation of use, so that a distinct cavity is often found in the X-ray picture.

The diagnosis of fracture of this bone is usually made by the X-ray. Crepitus and ecchymoses are not always present. The swelling, tenderness, pain and other immediate symptoms resemble those found in sprain of the wrist.

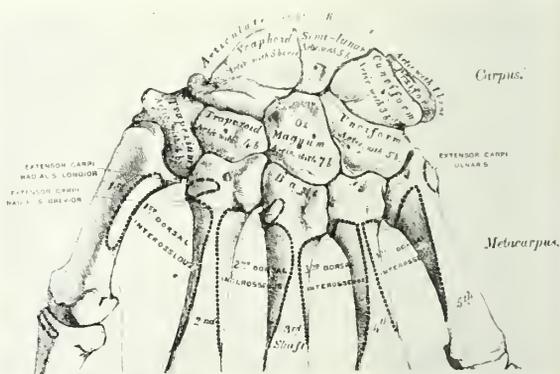
The prognosis of fracture of the tuberosity of the scaphoid is good, as this is an extra-articular affair which heals in a short time with no interference with the wrist joint. These fractures are best treated with massage, rest, and heat.

In the treatment of body fractures, Böhler

recommends immobilization by applying a non-padded plaster splint on the dorsal surface from the base of the fingers to the elbow joint with the wrist in slight dorsi-flexion and ulnar abduction.

If fractures of the scaphoid are not immobilized, the cleft between the fragments becomes progressively wider, and in about four or five weeks a cavity is formed between the fragments. "If such a fracture, with a delayed union, is treated by immobilization with a dorsal plaster splint, which is maintained for from four to six months, the cavity disappears and bony union takes place. After applying this splint the patient can work again and the pain and swelling disappear. After the splint is removed the wrist joint can be freely moved." He states that removal of the scaphoid in recent or in old fractures with cavity formation is absolutely contraindicated because it is a mutilating and disabling procedure. When it is removed, the hand tends to assume the position of radial abduction and is therefore very much weaker. Powerful clenching of the fist is possible only with the wrist in ulnar abduction. If operation is necessary, the removal of the proximal fragment is usually all that is necessary according to Dr. Cotton. This is best removed through a short dorso-lateral incision over the bone.

Scaphoid fracture, with row on row dislocation of the carpal bones, calls for reduction or



It will be noted that the tuberosity of the scaphoid does not enter in the articulation with the radius. It is because of this fact that fractures of that process are not serious.

operation. Cotton recommends removal of the proximal row if reduction is not possible. It seems to me that reduction in these cases should be done and I believe it can be done in most cases, under proper anesthesia and with adequate traction.

Treatment of body fractures of the scaphoid

depends somewhat on the displacement of fragments. If there is none, the hand is treated by immobilization as described above, for at least six to eight weeks, in a position of slight dorsal flexion and slight ulnar abduction. If a fragment is displaced on the dorsum, the wrist is acutely flexed, firm pressure is made on the back of the hand, and the joint is then completely hyper-extended. If reduction fails by this method, Jones advises immediate removal of the displaced fragment or the whole bone.

Neglected cases which refuse operative treatment may be improved by the hand being fixed in slight hyper-extension, with the use of the wrench if necessary, as the hand grip has been weakened because extension is limited, the power of grip being greater in the position of extension.

The results of all methods of treatment lead to the conclusion that if a dislocated fragment cannot be reduced and held in place, it should be excised because of the pain, pseudoarthrosis and limitation of motion resulting therefrom.

## Traumatic Injuries of the Back\*

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**D**ISLOCATED vertebrae occur most commonly in the cervical region. Dislocation without fracture is very uncommon except in the upper cervical, the lumbosacral and the coccygeal regions. Extreme care is needed in handling these dislocations in view of the possible injury to the spinal cord or nerve roots.

Given a dislocation in the cervical, dorsal, or lumbar region; put the patient flat on his back, guarding against sudden motion and keeping the spinous processes straight. Elevate the head of the bed about twelve inches and put from ten to twenty pounds counter-traction on the head by a sling under the chin and cross-strapping around the forehead. This procedure may effect reduction in from one to twenty-four hours according to the extent of injury and time elapsed since the injury.

More definite traction can be applied by attaching a strong sling to the head and passing a rope through an overhead pulley. The head, neck, and spine are held firmly, while strong traction gradually raises the patient from the semi-seated to the nearly-erect position. If you are successful, you have relief of pain and absence of deformity.

Anaesthesia may be used, but it is safer to proceed under an injection of morphine. The after-care consists of some form of plaster cast applied while the patient is in traction. In the cervical group, a head and neck piece should be applied, passing across the shoulders and as far down as the twelfth dorsal vertebra. In the dorsal

or lumbar group, a plaster cast can be applied from the head to the pelvis. These casts can be worn from two to four months and are followed by some form of metal support.

If reduction is impossible, laminectomy is indicated.

An iliosacral or sacro-iliac dislocation without fracture is extremely rare, and it is quite questionable whether it ever occurs. Remember that some inflammatory condition is often responsible for low back pain, such as arthritis or prostatic infection, inter abdominal pathology or focal infection.

Under *fractures of the spinal column*, I will consider first, fractures of the transverse processes. In a recent article by Paul A. Quaintance in the Archives of Surgery for 1929, a series of thirty-three cases of fracture of the transverse processes of the lumbar vertebrae was reported. He stated that in this series, direct external violence was responsible for the injury in eighteen instances. Direct internal violence (forcible raising of the ilium) caused one; the cause of the remaining fractures was questionable. The most important diagnostic sign was tenderness over the injured processes.

Uncomplicated by other bony injuries, fractures of the transverse processes usually heal completely with recovery of normal function. Treatment consists of strapping with adhesive, rest in bed, and a properly fitted corset belt, with the back in the normal attitude until callus has begun.

*Vertebral fractures* occur most commonly at the cervical-dorsal, dorso-lumbar, or lumbosacral junction. Fracture displacements above

\*Read before the Great Northern Railway Surgeons' Association, at Glacier Park, Montana, June 29, 1931.

the fourth cervical vertebra are usually fatal. Vertebral fractures can be divided into two chief clinical divisions. Those without, and those with, injury to the cord. You can have cord-injury without box, or box-injury without cord, or both. The extent of bony damage is not always proportionate to the extent of cord damage and the converse of this is also true.

Treatment of vertebral fractures without displacement depends on the site and extent of the fracture, and, in all, the *normal contour* of the spine is overcorrected and support should extend far enough from the site of the fracture to prevent sagging. Lateral X-rays show a narrowing or wedging of the front of the vertebral body. This occurs most often in the lower dorsal or lumbar region where superimposed weight angulates the column.

In one case that I will present, the body of the second lumbar vertebra was crushed while lifting a heavy weight. It is often wise to immobilize fractures of the vertebral body for several months by a plaster cast or shell followed by a Taylor brace, until bony union is apparent, which is approximately six to nine months from the time of the injury.

Fracture of a vertebral body may be undiagnosed for months following an injury until root pains force the attention, due to incurring angulation. But support must be applied until the quadrilateral bulk of the vertebral body is assured, or at least until there is a fixation at this point and root irritation is minimal. In this, the non-displaced group, your efforts are centered on prevention of angulation with its consequent pain and weakness.

R. Watson Jones, Orthopedic surgeon of Liverpool University, in the *British Medical Journal* for February, 1931, gives an article on manipulative reduction of crushing fractures of the spine which should be read and reread by every railroad surgeon. For ages it has been recognized that fractures demand reduction and some form of immobilization. The back has been immobilized, but reduction has been neglected.

Arthur Davis, of Erie, Pennsylvania, described a method of treatment of crushed fractures of the spine by hyperextension and forced manipulation, but Jones' method combines the same principles; is simple, safe, and accomplished without anaesthesia. It can be used under any condition without complicated apparatus.

Keeping in mind that the cancellous portion of the body of a vertebra is a delicate framework surrounded by a compact layer of bone, it

is easily seen that once the compact layer is broken, very little force is necessary to make the vertebra collapse, and an equally small force applied in the opposite direction will open up the cancellous tissue again. Also the interlocking of the segments of a fully-extended spine is so close that the trunk above and below the level of the fracture provide a pair of unusually powerful levers.

The bodies of the vertebra are joined by long, medium and short common ligaments attached to the superior and inferior plates. They are almost always left intact when a compression is produced and are the strings that help pull the plates back into position in hyperextension of the spine.

The Jones' method consists of placing two tables end to end with a space between slightly greater than the patient's trunk. The front table is raised on blocks so that it is about two feet higher than the other. If this front table happens to be adjustable, as is the head of an operating table, one can gradually get the proper extent of hyperextension after the patient is in the proper position. A general anaesthetic is unnecessary, and, in fact, the position can be better maintained without it. One-third of a grain of morphine should be given one-half hour before operating. From the beginning, flexion of the spine must be avoided.

The patient is lifted face downward on to the lower table, and a stockinette is stitched over the shoulders and between the perineum. The spinous processes and the iliac crests may be protected by small pads of adhesive felt. The patient is now assisted into such a position that he is gripping the edges of the higher table with his abducted arms, the head resting on a small pillow. The lower table supports his lower limbs as high as the upper thigh, but there is no support between the groin and the neck. In this position the spine gently sags into full hyperextension.

The plaster is applied at once and is well moulded to the curve of the spine, the sacrum, and the iliac crests. The rubbing in of layer after layer of plaster gives just sufficient pressure to insure one that the normal limit of hyperextension has been reached. The plaster should extend up to the neck, and although it may be cut out below the axilla to allow free movement of the arms, none must be removed from the front of the thorax. It extends well over the sacrum and down to the level of the trochanters and symphysis, with a curve cut out at each groin to allow flexion of the hips.

*After-Treatment*—As soon as the plaster is dry, the patient is encouraged to move about in bed and is turned frequently to avoid pulmonary congestion. From the second or third day, in uncomplicated cases, regular exercises for the erector spinae muscles are practiced at regular intervals. Lying prone in bed the patient should lift the head against resistance. Each lower limb should be lifted with the knee straight. These exercises will keep the muscle tone of the back in better condition than any amount of massage and electrical treatment.

After ten days the patient is allowed to get up and walk for increasing intervals. The sooner a man realizes that his back is all right, and that he can walk, the better it is for his mental condition, and consequent disturbances are less likely. Protection of the vertebrae is necessary for four months. Then the cast can be removed and normal movements of the spine begun, and the patient should be able to resume his normal occupation eight or nine months after the injury.

Jones reports six entirely successful cases by this method.

All first-aid workers should be taught that a patient with an injured spine should be carried face down. If he is carried face-upward, the spine is flexed and the deformity must be exaggerated. If, on the other hand, he is carried face-downward, the spine is hyperextended. This in itself will help reduce the displacement.

The ease with which some of these fractures are reduced and the progressive absorption of the body of the vertebrae later when not kept hyperextended explains Kummell's disease.

Given a slight crushing fracture with no X-rays before reduction, it may be practically impossible to recognize the fracture with the hard vertebral plates pulled back into position after reduction, but the body-weight without protection will give a progressive absorption of the body of the vertebra, and, unless you have the early X-ray evidence with the history of trauma, the etiology goes unexplained as Kummell's disease.

From now on, until I have reason to change, I expect to treat crushing fractures of the dorsal or lumbar vertebra by the Jones' method, ie, plaster cast applied in hyperextension, with morphine but without anaesthesia. Patient is allowed to be turned in bed, given active exercise as described, and is ambulatory in two weeks. Remove the cast in four months, and the patient returns to work in nine months, without, I hope, any kyphosis.

CASE A: The patient was a boy twenty years

old, injured in April this year. He was a football player, and while going through the line, his head was jack-knifed over onto his chest. On examination, he had pain in his neck, pain in his right shoulder, paralysis of the right arm. He had fixed traction for four days, then manipulation without anaesthesia with no result. On the fifth day he was manipulated under anaesthesia with practically complete reduction. Continued traction was kept up for three days when a Thomas collar was fitted. He is still wearing the Thomas collar, and the reduction is checked by X-rays.

CASE B: Injured August, 1929. The patient fell about three feet, and as he fell, he struck his back over his lumbar vertebrae. He complained of pain over his back which spread to the back of both of his legs. X-ray examination showed extreme hypertrophic arthritis involving the fifth dorsal thoracic to the first lumbar vertebra.

He also had extremely septic teeth and tonsils. After considerable effort, his mind was diverted from the injury to his teeth and tonsils. These were removed, and two months after his injury he returned to work.

CASE C: This is a case in which the transverse processes of the third and fourth lumbar vertebrae on the left side were fractured. There was also a complication by the fracture of the ascending and descending rami of the pubis on the left side. There is an indistinct line of the fracture of the transverse processes which are healed by bony union in good position.

This man was seen by me six weeks following his original injury. He complained bitterly of a pain down his left leg and hip. This pain continued for a period of five months following his injury and he returned to work.

CASE D: This is a case of a slight crushing fracture of the superior surface of the body of the second lumbar vertebra which would be missed entirely without a lateral view.

This man is a machinist's helper, twenty-five years of age. He came to my office four months after his alleged injury to his back. He had worked during this period but complained of recurring pain in his back which was brought on by some extra exertion; the pain would last for several days. He would be off work for two or three days and would then return for another period. This repeated itself several times. He had seen two physicians in the meantime and had a diagnosis of lumbago. X-ray examination showed compression fracture of the second lum-

bar vertebra. This man had had periods of complete freedom from pain during the four months that had elapsed since the injury.

Finally after corresponding with the claim's department, the chief surgeon, and the operating department, he was given a moderate back support and work entailing no heavy lifting, with the final results of no complications either physical or legal.

CASE E: This is a case of fracture of the body of the second lumbar vertebra, which also

would be missed in an antero-posterior view.

This man fell from the signal tower. He complained of pain in his back but had no radiating pains or root involvements. The X-ray showed a definite crushing fracture of the body of the second lumbar vertebra.

He was treated with a slight hyperextension, and at the end of two months given a Taylor brace. The brace was worn up to ten months following the injury although he was doing light work the last three months of this time.

## Clinical Pathological Conference

By E. T. BELL, M.D.

Department of Pathology, University of Minnesota  
Minneapolis, Minnesota

The Department of Pathology of the University of Minnesota conducts a course in clinical pathologic conferences. Cases are selected in which a thorough clinical study has been made. Many physicians have expressed interest in this type of study and therefore the Journal-Lancet is publishing a series of these conferences. The clinical data are taken from the hospital records and are given absolutely according to the data on the record. Following the clinical report a summary of the pathologic findings is given and a few comments are made on interesting features of the case.

**AUTOPSY-29-1085:** The case is that of a young woman, 26 years of age, who was admitted to hospital on May 11th, 1929, complaining of chills, fever, and recurrent attacks of gallbladder colic. She had "flu" about a month previous to admission, from which she recovered completely. About a week later, she suddenly started to run a fever along with general malaise, weakness, loss of appetite, and headache. Fever was accompanied occasionally by chills. She had had a mild, persistent cough.

Her health had been fair; she had had "heart trouble" for the past three or four years. Cholecystectomy and appendectomy were done in 1926; coccyx removed in 1927. Scarlet fever in 1926, following cholecystectomy; rheumatism for four months when twelve years old. Occasional tonsillitis. Had occasional swelling of ankles; occasional palpitation; frequent precordial pain; had been in bed several times on account of heart trouble. She had frequent attacks of colic in the gallbladder region since cholecystectomy.

**Physical examination**—A loud systolic murmur over the apex transmitted to the axilla and back; this became musical later on. Temperature during the first 24 hours after admission was 101.4° to 103°; daily rise to 102°, later to 103°, and occasionally to 104°. Occasional chills. Complained of severe gallstone colic several times.

Blood culture repeatedly positive for streptococcus viridans.

While in hospital her mental condition became changed and on June 13 she developed right side hemiplegia, her face being drawn to the left; speech became impossible. This condition, while improved somewhat, persisted until the end. Showers of petechiae were noted from time to time, particularly over the chest, neck, and upper extremities. Patient complained of severe pain in the right foot, subcutaneous lumps in the leg and arm which were transitory.

**Urinalysis**—June 4, amber, cloudy, acid 1010, albumin +, sugar negative, 4 to 6 red blood cells and 3 to 4 pus cells.

**Blood on entrance**—Hemoglobin, 81 per cent; erythrocytes 4,460,000; leucocytes 9,700, with 76.5 per cent polymorphonuclears, 19 per cent lymphocytes, 4 per cent monocytes, 5 per cent basophils. May 22: Hemoglobin, 72 per cent; erythrocytes 3,860,000; leucocytes, 10,400. July 10: leucocytes 13,100.

On May 12, 14, 18 and July 15, agglutination for B. abortus and Widal tests for typhoid and paratyphoid A and B were negative.

The patient died July 21, 1929.

**Postmortem Report**—No edema; no jaundice; numerous petechial hemorrhages, especially over the neck and anterior chest and in the conjunctivae. Heart 250 grams; the mitral valve shows

old diffusely thickened leaflets covered by fresh soft vegetations; the leaflets are moderately stiffened and the mitral opening is somewhat narrowed. Spleen 250 grams; it shows a number of infarcts. Chronic passive congestion of the liver is noted. The kidneys together weigh 310 grams; the surfaces are smooth; numerous infarcts are present; the cortices are cloudy. A small abscess is in the caudate nucleus on the left side; also a small abscess in the left frontal lobe.

Microscopic examination shows passive congestion of the liver; abscess of the brain; and embolic glomerulonephritis.

*Comment*—This is a typical case of subacute bacterial endocarditis. The finding of streptococcus viridans in the blood culture establishes the diagnosis when considered in connection with the clinical findings at that time.

*Autopsy-27-1252*: The case is that of a boy, age 9, who was admitted to hospital, November 15, 1927, complaining of joint pains, headache, vomiting, and difficulty in breathing. About a year ago he had headaches and attacks of vomiting. He also had some pains in his shoulders and since that time had had involvement of practically all the joints in his body. For four weeks prior to admission to hospital he was compelled to sleep sitting up because of difficulty in breathing. In August, 1927, he had an attack with his right ankle swollen and tender. He was laid up with this for 3 or 4 days and was around again for a period of 3 weeks, when he began complaining of pain in the epigastrium, particularly in the late afternoon; this hurt him also when he took deep breaths.

Examination showed the tonsils large but with no apparent evidence of infection. There were signs of fluid in the chest and marked edema of the chest, entire lower abdomen, and back. There was also some sign of ascites. There was a definite pericardial rub at one time, which was transient. Blood pressure 114/82. There was blood in the stool on numerous occasions. Urinalysis showed a faint trace of albumin and on two occasions albumin 3+. Hyaline and granular casts were found from time to time; there were also a

few leucocytes present. Blood: Hemoglobin 61 per cent; red cells, 3,760,000; white cells 16,900. The Wassermann was negative. The patient's temperature was never high, ranging between 99° and 100°. His pulse rate was very rapid, usually above 110. A clinical diagnosis of rheumatic endocarditis was made. The patient gradually became weaker and died November 29, 1927.

*Postmortem*—Marked pitting edema from the level of the umbilicus to the ankles. Purplish discoloration of the right foot. Marked subcutaneous edema of the abdominal wall. No ascites. Appendix normal. Liver 4 cm below the costal margin in the right mid clavicular line. The left pleural cavity contains no excess fluid but the lung shows numerous soft adhesions laterally. The right pleural cavity shows the lung adherent at the apex and over the pericardium.

The pericardial sac is firmly adherent to the sternum. The visceral and parietal pericardial layers are firmly adherent so that the pericardial space is completely obliterated by strong adhesions. The base of the pericardium measures 12 cm transversely. No pulmonary embolism. The heart with the pericardium weighs 265 grams. Both ventricles are definitely hypertrophied and markedly dilated. A large mural thrombus at the tip of the right ventricle and a similar one in the right auricular appendage. The mitral leaflets show numerous small, firm, pearly white nodules over the areas of contact. The nodules extend down over the chordae tendineae. The aortic leaflets also show similar vegetations. There is no contraction of any of the leaflets. There are infarcts in the lungs, spleen and kidneys. Marked cloudy swelling of the heart, liver and kidneys. Chronic passive congestion of the liver.

*Diagnoses*—Old chronic pericarditis. Recent acute rheumatic endocarditis. Mural thromboses with infarction of the lungs, spleen and kidneys. Death apparently from cardiac failure.

*Comment*—Persons who die during the acute stage of rheumatic endocarditis usually die of a complicating pericardial involvement. The infarcts are from the mural thromboses. The rheumatic vegetations are too firm to become detached.

E. T. BELL, M.D.



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South Dakota State Medical Association      The Soo Railway Surgical Association  
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### FRACTURE EDUCATION

We have the good fortune in this issue to present the proceedings of the meeting held in Minneapolis on February 3rd and 4th to discuss the treatment of fractures. This meeting was planned by the Minneapolis Regional Committee on Fractures, under the General Committee on Fractures of the American College of Surgeons, working in conjunction with the Minneapolis Surgical Society. The attendance at these meetings and especially the very gratifying number of visitors from localities outside Minneapolis, shows that the educational efforts of the College of Surgeons and the American Medical Association are bearing fruit in the form of a greatly stimulated interest in the subject of fractures.

In spite of the fact that the "machine age" dawned many years ago, only within recent years have well-organized and concerted efforts by influential bodies in the medical profession, been made to secure for the victims of the "machine age" the benefits of the most efficient methods of treating fractures. These efforts are the result of a growing dissatisfaction among surgeons with the results obtained in many cases, and of pressure brought from without, by employers of labor, by insurance companies carrying compensation and liability insurance, and by the rapidly increasing number of suits for malpractice following in the wake of accidents producing fractures. Although some of these influences are of rather recent devel-

opment, the leaders of the profession have for many years recognized the responsibility.

A review of Hamilton's "Treatise on Fractures and Dislocations," published in 1860, is still as pertinent as if it had been written today: "There are few subjects of more immediate importance to the general practitioner than those which this volume elucidates. Every physician is liable at any moment to have his skill put to the test by obscure and doubtful cases on the event of which may, perhaps, depend the future usefulness of the patient and the reputation of the surgeon; the frequency of this class of injuries and the number of trials for malpractice thence arising, rendering a familiarity with their diagnosis and a knowledge of the best plans of treatment is one of the most valuable acquisitions that the general practitioner can have."

Perhaps Dr. Emil S. Geist has inadvertently disclosed a reason for the rather tardy awakening of a general interest in fractures, when he enumerates "gray matter" at the head of the list of necessary paraphernalia. Gray matter often operates in very perverse ways, and things that would seem to be obvious are often overlooked altogether. Ever since the hairy pithecanthropus began to lose his hair and without that natural defense, to be subject to the attacks of the mosquito, the insect has been demonstrating the principle of the hypodermic needle for the purpose of extracting blood from or of injecting medication into the body, yet countless centuries rolled around before man adapted to his own use the principle which the mosquito had so long been demonstrating. Samuel D. Gross (the elder Gross), in his very entertaining and readable autobiography, comments on this peculiar characteristic of gray matter and remarks that "the Woodpecker was an auscultator long before Laennec." A more modern example is that of the physician who, on first witnessing a demonstration of x-rays, remarked that it was an

interesting and curious toy but that it could never be put to any practical use.

We call this attitude conservatism, and, as related to the treatment of fractures, it may not be entirely unjustifiable, for undoubtedly many good functional results were obtained long before the x-rays made accurate diagnosis possible, or worried the surgeon by showing him how bad the anatomical result appeared. It must be admitted, however, that in general, the results of treatment will bear a rather direct relation to the accuracy of anatomical restoration. Therefore the conservative attitude must be replaced by one of less complaisance, in which less reliance is placed in the "healing power of Nature," and more in the knowledge, skill and ingenuity of the physician.

Since the treatment of fractures is essentially surgical, it is but natural that the College of Surgeons and the various surgical societies should take the lead in this educational campaign, but the men in charge of the educational meetings should not lose sight of the fact that the large majority of all fractures will be treated by physicians in general practice and that the campaign, to be of the greatest benefit to the greatest number, must reach them as well as the surgeons.

S. H. B.

#### SOCIAL VERSUS STATE MEDICINE

Sometimes we think enough has already been said and written about the apparently declining appreciation of the medical profession by the laity. We still think that too much of this discussion has taken place in mixed audiences, and that for the present, it should be confined to medical men only.

We should first come to some understanding, among ourselves, as to what "all the shooting is about." In medical circles, we frequently complain of being complained of. These complaints are of such varied nature that they can not be disposed of with ease as if we were dealing with some single question; indeed, we do not believe that they can be solved altogether at all, but we do maintain that a fuller understanding by the profession of the basis for these complaints through a freer discussion in medical societies, can do much to create sentiment for such conduct, on the part of the profession, as will materially reduce the harmful effects of the present epidemic of alleged grievances.

Epidemics have a way of recurring, but each usually differs from those that have gone before, in the character and intensity of the prevailing symptoms, and the present is no exception to that

rule. Two outstanding features underlying this are, scientific progress and economic unrest. The one demands greater outlay for new instruments of diagnostic precision, and increased expenditure for modern methods of treatment, while the other involves the unpleasant necessity of making adjustments to the recent upheavals in the financial world.

The chief complaint of the laity is "the high cost of medical care" and the chief fear of the profession is the "trend toward state medicine." It is of little surprise that the former should fail to understand economic values in medicine when, on the one hand, a large fee is exacted and on the other, the same service, performed with equal diligence, by the same operator, is given away. The latter group is also beginning to criticise further encouragement of this system by members of their own profession, pointing out that it fosters the trend already referred to and which they believe is detrimental to the best interest of all.

Secretary of the interior, Dr. Ray Lyman Wilbur, in a recent discussion on the high cost of medical care, said, "Why physicians practice charity towards those unfortunate people who belong to the whole community, is beyond the understanding of anyone except a doctor who has been accustomed to it, and the people who have been taking it for granted. Nobody else does it, and yet we go on, with these complicated economic conditions, at a time when conditions in every direction are compelling us to consider economics as never before." And yet the principles of medical ethics expressly state that "the poverty of a patient should command the gratuitous services of a physician."

The question then, is simply this; how may the unfortunate receive the gratuitous services of a physician, at the expense of the whole community, to whom they belong, without the establishment of state medicine? A satisfactory answer to this question will arrest the epidemic. There must be some solution and all are invited to use the columns of this Journal to contribute their suggestions.

A. E. H.

#### MAGGOTS ARE BACK

A quarter of a century ago, that grand old man, now 95, Dr. W. W. Keen, of Philadelphia, speaking at a reception, given in his honor by Dr. William Osler, at the Baltimore Club, related his experiences during the Civil War and aroused great interest by contrasting the methods of wound treatment during those periods.

In that enlightened audience, there were many whispered "*think of its*" when he told of the hardships in preantiseptic days, when *even maggots covered the wounds*.

Little attention was then paid to his statement that these maggots, in his opinion, sometimes served a useful purpose, and were productive of good results in many chronic cases.

Today, we must give him credit for qualities of observation befitting his name.

The treatment by maggots, especially in cases of chronic osteomyelitis is now of recognized value. Not only do they clear up many that have resisted years of treatment, at the hands of competent orthopedists, but the end results, by reason of much stronger cicatrices produced are better. Sequestrectomy, if indicated, precedes their application. It is interesting to note that the average lifetime of a fly is twenty days and that egg deposition takes place on or about the fifth day.

While we marvel at Dr. Keen's observation along this line, seventy years ago, we are reminded that observation is the cornerstone upon which diagnosis rests, every day, in every way, we can cultivate it to clarify the present and advance the future.

We are reminded too of the boy who translated *tempus fugit* into "fly time." Well, now that fly-time is here, what shall we call the new specialist?

A. E. H.

## SOCIETIES

### Iowa State Medical Association

Sioux City, Iowa

May 4-5-6, 1932

The members of the South Dakota and Minnesota state medical societies are cordially invited to attend the annual session of the Iowa State Medical Society, to be held in Sioux City, Iowa, May 4, 5 and 6. The program, which is an especially strong and interesting one, begins at 8:00 a. m. on Wednesday, May 4 and concludes at noon on Friday, May 6. There will be an hour and a half of medical and surgical clinics each morning, and symposia upon the following subjects are included in the program: kidney, blood diseases, neurological conditions, cancer and pediatrics.

Presentation of a membership card in the South Dakota State Medical Association or the Minnesota State Medical Association will admit any physician to full privileges in all scientific sessions.

### Minnesota State Medical—Minnesota State Hospital Associations

St. Paul, Minnesota

May 23-24-25, 1932

Technical exhibits and table demonstrations will occupy an important share of program time at the 1932 meeting of the Minnesota State Medical and the Minnesota State Hospital Associations scheduled jointly for May 23, 24 and 25 at the new St. Paul Auditorium. The occasion will mark the largest joint gathering of medical and hospital men ever held in the Northwest.

Representatives of eight states, including Montana, North and South Dakota, Nebraska, Wisconsin, Iowa, Wyoming and the Winnipeg Medical Society of Manitoba, Canada, are expected to attend.

The enlarged scope of this meeting has occasioned a number of program departures. Scientific and technical exhibits and table demonstrations as well as the large Monday night medical economic meeting to be held in the Auditorium theater will take in both great associations.

One special feature of the 1932 arrangements calls for two one hour program sessions each day and an open Monday evening session in the exhibit hall. This is for the especial purpose of giving every meeting visitor a chance to examine all exhibits.

The most interesting program novelty will undoubtedly be the 40 table demonstrations to be held during the daily one hour exhibit hall sessions. These demonstrations are to be sufficiently varied in subject to interest everybody and those who are not attending the demonstrations may take advantage of the time to study the exhibits.

Twice daily the demonstrations will be conducted from 10 a. m. and from two to three p. m. by twenty of the best qualified men in the state. The section on clinical demonstrations and exhibits is taking every care to guard against repetitions or overlapping in subjects. Among the subjects selected to date are: fungi; the Ascheim-Zondek test; the electro-cardiograph; undulant fever; the allergic skin test; cauterizing the cervix; brain model; localization; ulcer X-ray; eye grounds; fracture demonstrations. Final choice of those who are to give the demonstrations will be made at the February meeting of the Committee on Scientific Assembly.

Both scientific and technical exhibits will have the benefit of the unusual space and presentation facilities of the new auditorium. The committee in charge already reports an unusual number of entries. The gold medal for the best scientific exhibit will be offered again for the third consecutive year by the Southern Minnesota Medical Society. The medal was won in 1930 by Dr. Leo Rigler of the University of Minnesota and in 1931 by Dr. William P. Herbst and Dr. R. K. Ghormley of Rochester. Competitions are expected to be keen in 1932 for the award.

A series of six clinical pathological and clinical radiological conferences has been arranged as another 1932 novelty for the Monday afternoon program. Drs. E. L.

Tuohy of Duluth; Harold Robertson of Rochester; John Noble of St. Paul; B. R. Kirklin of Rochester and Leo Rigler of the University have been assigned to conduct the conferences, each of which will occupy 40 minutes of program time.

Hospitalization and medical care of Veterans is the subject to be discussed before a large joint meeting of the hospital and medical associations Monday night in the theater of the auditorium. Speakers for this meeting which is to represent hospital men, the medical profession and lay trustees of hospital boards include the Reverend Father Alphonse Schwitilla, President of the Catholic Hospital Association; Mr. F. R. Bigelow, President of the St. Paul Fire and Marine Insurance Company; Mr. E. V. Cliff, Ortonville, National Executive Committee, member of the American Legion and, if his engagements permit, Dr. Olin West, Secretary of the American Medical Association.

### Sixth District Medical Society

Bismarck, N. D.

February 10, 1932

"A meeting of the Sixth District Medical Society was held on February 9, 1932. There were thirty members present and three visitors. Dinner was served at the Patterson Hotel, Bismarck, after which the following program was presented:

1. Common Diseases of the Ear—Dr. W. L. Diven, Bismarck.

The discussion was opened by Dr. P. L. Owens of Bismarck, and Dr. E. P. Quain and Dr. R. W. Henderson of Bismarck also discussed the paper.

2. Common Disease of the Throat—Dr. L. G. Smith, Mandan.

3. Common Diseases of the Eye—Dr. G. M. Constans, Bismarck.

The discussion was opened by Dr. H. A. Brandes of Bismarck and Dr. P. L. Owens of Bismarck and Dr. B. S. Nickerson of Mandan entered into a discussion of the paper.

All of the essayists were members of the local Society and the material they covered was of interest to the general profession."

L. W. LARSON, Secretary.

### Minnesota Radiological Society

The winter meeting of the Minnesota Radiological Society was held at the University Hospital in Minneapolis on Saturday, February 13, 1932. The following program was presented:

Clinical-Pathological-Radiological Conference

Conducted by Dr. W. A. O'Brien

Assisted by Drs. B. Pearson, O. Randall, R. Koucky

1. Ewing's Sarcoma of Bones—Discussion by Drs. W. Cole, C. Hansen.

2. Multiple Myeloma with Intestinal Obstruction—Discussion by Dr. O. H. Wangenstein.

3. Carcinoma of Breast with Multiple Metastases—Discussion by Drs. K. Stenstrom, O. Campbell, L. Rigler.

4. Carcinoma of Antrum with Peripheral Metastases—Discussion by Drs. W. Peyton, K. Stenstrom.

Relative Value of Stereoscopic and Single Films in the Routine Examination of the Chest—Dr. Frederick B. Exner.

Studies on the Routine Examination of the Chest in Students—Dr. Harold Diehl.

Anomalous Lobes of the Lungs—Dr. L. G. Erickson. Observations on Intra-pleural Pressure in Massive Pulmonary Atelectasis—Dr. Rudolph Koucky.

Radiation Therapy of Neuritis—Dr. John J. Eneboe. Fractures of the Sesamoids—Dr. Jacob Sagel.

Methods of Radiation Therapy of Carcinoma of the Esophagus—Dr. C. O. Hansen.

Intraperitoneal Herniae—Preliminary Report—Dr. Frederick Exner.

The Use of Thorotrast in Röntgen Diagnosis—Preliminary Report—Dr. L. G. Ericksen.

### Addresses

The Recent Literature on the Classification and Treatment of Bone Tumors—Dr. W. A. O'Brien, Professor of Pathology, University of Minnesota.

Cholecystographic Studies on the Emptying of the Human Gall Bladder—Dr. E. S. Boyden, Professor of Anatomy, University of Minnesota.

The next meeting of the Society will be held in St. Paul, May 23, 1932.

### Sioux Valley Medical Meeting

Sioux City, Iowa

January 26-27, 1932

The thirty-seventh annual session of the Sioux Valley Medical Association was held in Sioux City, Iowa, January 26 and 27, 1932. A large gathering greeted our President, Dr. J. C. Ohlmacher, head of the Department of Pathology and Bacteriology of the Medical School at the University of South Dakota, when he called the meeting to order. A large supply of interesting clinical material had been gathered by the physicians and surgeons of Sioux City for the dry clinics conducted during the forenoons of the two days.

Those appearing on the program the first day were: Dr. Frank C. Neff, head of the Department of Pediatrics, College of Medicine of University of Kansas, Kansas City, Mo., who conducted a Pediatric Clinic and presented a paper entitled, "Nutrition in Children of School Age;" Dr. Lewis A. Buie, head of the Section of Proctology, Mayo Clinic, Rochester, who gave a lecture in two sections entitled, "Proctologic Problems of the Practitioner, Internist, and the Surgeon;" Dr. Ralph Major, head of the Department of Internal Medicine, College of Medicine of the University of Kansas, Kansas City, Mo., who conducted a Medical Clinic and gave a paper entitled, "Review of Arterial Hypertension and Chronic Nephritis;" Dr. Hillier L. Baker, instructor and surgeon at Rush Medical College, Chicago, who presented a paper entitled, "The Treatment of

Intestinal Fistula;" Dr. C. A. Roeder, Associate Professor of Surgery, College of Medicine, University of Nebraska, Omaha, Nebr., who gave a paper entitled, "A Resume of 2,000 Operations Upon the Goitrous Thyroid;" Dr. Walter C. Alvarez, Consultant in Gastro-Enterology at Mayo Clinic, Rochester, Minn., who gave a paper entitled, "Practical Points in the Treatment of Patients with Indigestion." At the conclusion of the evening session a buffet luncheon was served, followed by informal talks and a reception.

Those appearing on the program of the second day were: Dr. James G. Carr, Professor of Medicine, Northwestern University Medical School, Chicago, who conducted a Medical Clinic and presented a paper entitled, "The Treatment of Pneumonia;" Dr. Phillip Lewin, Associate Professor of Orthopedic Surgery, Northwestern University Medical School, Chicago, who conducted an Orthopedic Clinic and gave a paper entitled, "Low Back Pain and the Sciatic Syndrome;" Dr. Harry E. Mock, Associate Professor of Surgery, Northwestern University Medical School, Chicago, who conducted a clinic on Traumatic Surgery and gave a paper entitled, "Cranio cerebral Injuries;" Dr. Elmer L. Sevringhaus, Associate Professor of Medicine, University of Wisconsin, Madison, Wis., who conducted a Diabetic Clinic and gave a paper entitled, "Medical Aspects of Diagnosis and Treatment of Menopause," and Professor A. J. Carlson, head of the Department of Physiology, University of Chicago, Chicago, concluded the program with his lecture on, "Recent Advances in the Physiology of the Endocrine Glands."

At a business session it was moved and carried that but one meeting be held each year, this meeting to be held during January and at Sioux City, Iowa, with the provision that Sioux Falls, S. D., may have the meeting on alternate years should their county society manifest a keen desire for this arrangement. Also, the dues were reduced to \$3.00 annually. The following officers were elected for the ensuing year: Dr. P. B. McLaughlin, Sioux City, Iowa, president; Dr. S. L. Slater, Worthington, Minn., vice-president; Dr. E. L. Perkins, Sioux Falls, S. D., vice-president; Dr. John Buis, Pender, Nebr., vice-president; Dr. Roscoe Jepson, Sioux City, Iowa, secretary, and Dr. W. R. Brock, Sheldon, Iowa, treasurer. The Board of Censors are: Dr. H. R. Humner, Canton, S. D., Dr. Garret Maris, Hull, Iowa, and Dr. W. R. Talboy, New Castle, Nebr.

In addition to those appearing on the program the gathering was addressed by Dr. Channing Smith, Granger, Iowa, president of the Iowa State Medical Society, and Mr. M. E. Herz, business manager of THE JOURNAL-LANCET, Minneapolis, which is the official journal of this society.

A committee composed of Dr. Wm. Jepson of Sioux City, Iowa, Dr. S. A. Hohf of Yankton, S. D., and Dr. J. B. Naftzger of Sioux City, presented resolutions of deep regret because of the death of three distinguished members of the Association during the past year, namely: Dr. R. F. Bellaire, Sioux City, who was a vice-president at the time of his death and had served four years as secretary; Dr. G. R. Albertson, Dean of the

Medical College of the University of South Dakota, and Dr. Donald McCrae, Jr., of Council Bluffs, Iowa, who was a charter member of this society.

Sound motions pictures were interspersed throughout the program and all papers and clinics were well received. The meeting was acclaimed a great success.

JOHN H. HENKIN, M.D., Retiring Secretary.

A CORRECTION

In the February 15th issue, in the article by Dr. Arnold S. Anderson, on page 115, the following was misquoted. It should have read as follows:

Systolic Blood Pressure.....	120 mm.
Diastolic Blood Pressure.....	80 mm.
Pulse Pressure .....	40 mm.
Pulse Pressure .....	40x100 50
Diastolic Blood Pressure.....	80 1

NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Dr. Agnes M. Keegan of Aberdeen, S. D., was a visitor in Minneapolis for a few days last month.

Dr. L. Danford Whitney, formerly with the Aberdeen Clinic is now located at Brookings, S. Dak.

Dr. F. W. Buckingham, formerly in practice at Bismarck, is now associated with the Aberdeen Clinic at Aberdeen.

Dr. O. W. Katz, who has been in active practice at Seneca, S. D., for several years, has moved to Faulkton, S. D.

Dr. A. M. Lindburg, Fargo, has been re-appointed superintendent of health for Cass County for the year 1932.

Dr. and Mrs. J. A. Watson, Minneapolis, have left for the east to sail for Naples, Italy. They will travel through Europe by motor.

The mid-winter meeting of the North Dakota Academy of Ophthalmology and Oto-Laryngology was held in Fargo, N. D., Feb. 13.

Dr. H. E. Sisk, a recent graduate of the University of Minnesota Medical School, has opened offices for general practice at Wabasha, Minn.

Drs. T. W. Murphy, Pierpont, and A. P.

Hawkins, Waubay, have been named members of the county health board of Day County, S. D.

Several of the smaller hospitals in the Northwest have started out the New Year on a cash basis, asking for a payment each week in advance.

Announcement has been made that the annual meeting of the Montana State Medical Association will be held this year at Miles City, on July 13-14.

St. Louis County, Minn., cases of death from tuberculosis have decreased each year since 1920 as less than 100 deaths were reported for the year 1931.

St. James Hospital, Butte, Mont., has installed desk phones in sixty of their rooms, so that the patients can keep in direct contact with relatives and homes.

Dr. David Berge, who has been associated with the Bratrud Clinic at Warren, Minn., is now located at Roseau, where he has opened offices for general practice.

Doctor Arthur Edward Smith, Minneapolis, has been appointed Chief Oculist for the Minneapolis, St. Paul and Sault Ste. Marie Railway, effective January 1, 1932.

Dr. H. G. Irvine, Minneapolis, was elected grand primarius of Alpha Kappa Kappa, national medical fraternity at the annual meeting held in New Orleans last month.

Dr. Anna Hyden, wife of Dr. Andrew Hyden, Alcester, S. D., died last month at their home. Both of them have been in active practice in South Dakota for over 35 years.

Officers of the Western Montana Medical Society for the coming year are Dr. W. T. Thornton, president; Dr. W. N. King, vice-president, and Dr. H. W. Dobbin, secretary-treasurer.

Nearly all of the leading hospitals in the Northwest, particularly in the larger cities, showed a deficit last year. This deficit was caused by the many uncollectable bills and the large increase in charity service.

Dr. J. P. Craven, Williston, N. D., is the new president of the Kotana Medical Society with Dr. P. O. C. Johnson, Watford City, vice-president, and Dr. I. S. A. Ab Planalp, Williston, secretary-treasurer.

Doctor A. D. Prangen, of the Mayo Clinic, addressed the academy upon the following sub-

jects: Early Management of Strabismus, Operative Treatment of Strabismus, and Problems and Procedures in Refraction.

Dr. John L. Calene, Aberdeen, was the guest speaker at the monthly meeting of the Medical Society held at Watertown last month. Dr. Calene presented a paper on "Diabetes Millitus," also two cases on "Lung Tumor."

The annual meeting of the South Dakota Medical Society will be held at Watertown on June 20-21-22, and the resident physicians of that city have started on a program that should make it one of the very best meetings ever held.

At the annual election of officers of the Winona County Medical Society recently held at Winona, Dr. P. A. Mattison, Winona, was elected president; Dr. R. L. Page, St. Charles, vice-president; Dr. I. W. Steiner, Winona, secretary, and Dr. L. I. Younger, Winona, treasurer.

Dr. and Mrs. D. W. Francis were host to the members of the Rice County Medical Society at their home in Faribault last month. The dinner was given in honor of Dr. Francis' brother who is in charge of Radio Stations for the United States Government in Shanghai, China.

Doctor Richard Olding Beard, executive secretary of the Health Council of Minneapolis, was honored at a luncheon at the Minneapolis Athletic Club by members of the Health Council. Dr. Beard, who has served as the executive secretary for six and one-half years, will retire on March 1.

Doctor G. M. Williamson, Grand Forks, was named president-elect of the Federation of State Medical Examining Boards of the United States at the annual meeting recently held in Chicago. Dr. Williamson has been secretary of the North Dakota State Board of Medical Examiners since 1911.

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters). Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month of March will be as follows: March 2nd—Personal Hygiene—Fresh Air and Sunshine; March 9th—Cleft Lip and Palate; March 16th—Prevention of Bronchiectasis; March 23rd—Fractures of the Spine; March 30th—How Does Cancer Begin?

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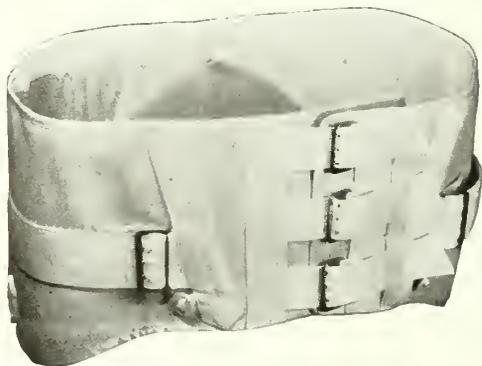
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## The Treatment of Syphilis\*

HENRY E. MICHELSON, M.D.

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Minneapolis, Minn.*

WHEN my good friend, Dr. Long, wrote and told me that his committee wished me to discuss the treatment of syphilis, I was much upset, for you all know that there is no one treatment for syphilis; and in the time allotted me I do not want to confuse you, nor to talk in such an abbreviated manner that the great importance of the subject will be minimized.

You all realize that we are treating individuals infected by a virus which is capable of attacking almost any tissue in the body, and that we must take into consideration the age, sex, size and weight of the patient, age of the infection and type of involvement as well as the ability of the patient to tolerate the drugs used. We are not treating a disease per se, but an infected person. We know that treatment must be individualized and made to fit the case before us; we cannot always mold the patient to fit a prescribed regime.

It is impossible to try to outline a treatment for syphilis in so many doses of so many grams each of this chemical and that drug. If we did this a great many people would be injured by that very treatment. We have to realize that we are dealing with a disease the extremes of which are a minute chancre and paresis. Obviously, the treatment for an uncomplicated case of primary syphilis is entirely different from that which is to be

administered to a person suffering with parenchymatous nervous system lues.

In the few minutes that I have at my disposal, the very best I can do is to give you a few fundamental generalizations, because the general medical public must have foundations for the various schemes of treatment laid down by men who have had a large experience extending over a period of years.

Unfortunately many doctors accept the information given them by the detail men who are sent out by the pharmaceutical houses. These men come around, and in a most confidential and convincing manner, advocate methods of treatment, dosage, and, incidentally, their particular drug. They talk as if they had had charge of a large clinic for years, and, I am afraid, often arrive prematurely at grave decisions about the priority of certain drugs in the scheme for the treatment of syphilis. I must plead with you to get your information elsewhere, and not to accept all that is extended gratuitously—with a commercial ulterior motive.

The leaders in this and other countries who have much material at their disposal and who have critical and analytical minds, must crystalize their opinions at regular intervals; and they must be the ones to bring their messages to the general practitioners.

Are we trying to treat individuals who have syphilis in order to bring about a cure so that the

\*An informal talk given before the Jubilee meeting of the North and South Dakota State Medical Associations at Aberdeen, South Dakota, June 2, 3, 4, 1931.

individual may pursue his life in his particular way, or are we trying to extinguish a plague? As practitioners, I am convinced that our duty is to the individual. If extinction is the goal, then the responsibility must be borne by the state, and the infected individual's rights must be entirely secondary to the public good. This would reduce every infected person to the position of a prisoner, or at least to that of a closely observed, paroled man. It would entail great individual hardship and untold mental anguish, and it is doubtful, even if such a plan were in force, if the disease could be exterminated.

Properly administered, effective, early treatment quickly renders the individual non-infectious, and probably will accomplish fully as much in a very much easier way. Therefore, we must teach all practitioners to be on the lookout for early infections; we must teach what the proper diagnostic procedures are, and we must try to simplify the initial courses, at least, so that the infective period will be as short as it is possible to make it.

You and I know that a Utopian state in the practise of medicine is impossible; therefore, I believe that every physician must adopt the best system that he can master and direct his treatment in favor of the individual. He must do what the dictates of his calling demand; namely, to treat and safeguard the interests of his patient. This calls for a type of treatment that can be borne ambulant, and carries with it a minimum of discomfort and risk while it still is effective.

In the treatment of syphilis we depend upon the arsenicals, bismuth, mercury, iodides, and certain non-chemicals such as inoculation malaria.

For practical purposes there is not enough difference in the various types of arsphenamines to dwell upon them in a talk like this. Furthermore, I think we may state that there is no decided difference in the different brands of the drug. If the government tests are of any value at all, and if the formula is made up as it is chemically exact, there should not be any difference at all. A poor workman always blames his tools. We should not be so prone to find fault with a particular brand of drug. We should be more alert for shortcomings in our own procedures. The arsenicals are so well standardized that I believe most of the trouble ascribed to this or that drug is usually due to one's inability to discover and understand intolerances or complications.

It is almost impossible to routinize the treatment of syphilis, but we must try to establish, if possible, a minimal sum total dosage and period

of treatment. I say minimal because we do not know the optimal amount, and obviously the maximal has not been set.

The treatment of syphilis may be discussed under various headings:

#### *Prophylaxis*

When a person has had a known exposure, either sexually or accidentally, and arsenical treatment is begun within a few hours, a very few injections are positive protection against the development of the disease. Professor Oppenheim, of Vienna, advocates the use of Spirocid, an arsenical devised for oral administration, for this purpose. General venereal prophylaxis is another procedure. It calls for private or public facilities for the administration of local chemical prophylactics after every sexual exposure, and is as is well known, effective. Just how efficient the local use of mercury is in preventing the development of syphilis is not known, for every person venereally exposed to syphilis does not develop the disease.

#### *Abortive Treatment*

Can syphilis be aborted? The European leaders are more inclined to recognize abortive cures than we are. Nevertheless, the premise for an abortive cure allows only a few individuals to be eligible for such a treatment. It calls for an early infection, only a chancre manifest, with positive identification of the spirochetes, and with a negative blood Wassermann reaction both before, during and after treatment. One should never speak of syphilis as being a local disease, for the work of Brown and Pearce, Geiger, and many others has shown that spirochetes can be found in the blood stream, and even in the spinal fluid before the Wassermann reaction is positive, and before visible lesions are present.

Abortive cure, as I lay it down, calls for a minimum of eighteen months of treatment consisting of at least eighteen injections of arsenicals, and thirty-six injections of bismuth. Abortive cures must be given with great reserve, and the period of post-treatment observation must be close and constant, and frequent.

#### *Early Treatment*

By early treatment we mean treatment begun in the early (say, first six months) stage of the disease. At this stage—usually the eruptive stage—the treatment can be routinized more easily than at any other time. The active, established early case of syphilis, between the third and the ninth month, should be treated for a period of about three years. Of course, I do not

mean that the individual is treated every day, or even month, of the three years, but he must be made to realize that he is to be under treatment that long; observation, as such, will not begin until after three years.

Why do we say three years? How can we arrive at such a dictum? These conclusions are the result of a careful study of the statistics of clinics such as Jadassohn's in Breslau, Finger's in Vienna, the Mayo Clinic, Michigan, Pennsylvania, Minnesota, and many others.

It has been found that, if the treatment is carried out somewhat as outlined over a sufficient length of time, one accomplishes what one is trying to do—namely, assist an individual to live out his normal span of life without being disturbed by the ravages of syphilis. By his physician's assurance the patient must also be spared the worry that may arise from haphazard procedure and the destroyed confidence which accompanies lack of a definite, and, may I say, more or less casual procedure. When an individual knows that if he follows a certain scheme his chance of cure is as good as it is possible to offer, he has confidence in his treatment and tolerates it much better. The object of this three-year course is to cure the patient, protect his immediate partner, and, by so doing, safeguard the next generation.

In the three-year period the patient should receive approximately forty injections of arsenicals, and one hundred injections of bismuth. I think that this may be accepted as today's standard, but please keep strictly in mind that this may all be changed tomorrow, and that our knowledge along this line is in a constant state of flux. I am not discussing criteria of cure now, I am merely outlining the chemical requirements.

#### *Late Syphilis*

In late syphilis we are dealing with an individual who may, or may not, have had some treatment in the early stages of the disease. He probably has passed through various degrees of immunity so that he has periods of complete subjective and objective freedom from syphilis, but now he has a recurrence—either clinical, serological, or both.

What is the difference between the treatment of such a case and that of early, active syphilis? The difference depends upon the fact that the longer the spirochetes are in the body, the more secure they become in certain areas, and the more vitally injured are some of the organs that they infest. Therefore, treatment at this stage must be administered with great regard for the possibility or seriously damaged viscera.

When a patient comes to us with a chancre or a roseola we do not worry about his aorta or his liver—but when we begin treatment for the most insignificant tertiary manifestation we must be alert for all sorts of upsets, because there is no way of knowing what internal involvement there is. That becomes manifest only under the influence of treatment. This type of reaction is known as the Herxheimer reaction, and is the reaction of syphilitic tissues against, or invoked by, the drug administered. The more powerful the drug and the greater the initial dose, the more severe is the reaction; hence, in all late, as well as early, syphilis we begin treatment with minute doses. In late syphilis, particularly, we begin with a mild drug, such as bismuth, instead of the more active arsenicals. We thus either prevent the reaction entirely, or it takes place in a very mild manner. If a patient who presents himself with a late nodular lesion in the arm receives a large dose of neosalvarsan as the initial injection, and his liver function is impaired by syphilis, a severe hepatic Herxheimer reaction may endanger his life. That is why the older syphilis is, the harder it is to treat. If all syphilis were on the skin it would be very simple to handle.

I can't impress upon you too much the need of a most careful examination before beginning treatment in tertiary syphilis. I mean that you should examine the blood and the spinal fluid. You should, if possible, have a competent hepatic and cardiac examination, and, if available, an opinion of the eye grounds is valuable. If you start the onslaught against late syphilis with heavy blows, you are just sure to come to grief sooner or later. Always begin with small doses; you will then find out how your patient tolerates the drug, and you will avoid unduly injuring impaired organs.

In latent cases which may be serologically positive, always pay particular attention to the history of previous treatment, for from that you will find out how the patient bore the drugs given. If there has been no previous treatment, even though no symptoms except positive serology are present, proceed with great care.

#### *Congenital Syphilis*

We must realize that the problem of treating congenital syphilis is quite different from that of treating acquired syphilis of the adult, because the little patient has been infected at a time when his tissues had very little ability to combat infection. The immunity-producing processes are probably not very active, and we find very few organs spared.

In treating congenital luetics we must not interfere with the natural growth of the child, hence treatments must be suited to the patient even more than in the case of adults. Co-operation must be secured through the employment of a refined technique. Every procedure must be as nearly technically perfect as possible. These little patients resent being hurt; their morale is easily shattered. Therefore, I say, use as painless a treatment as possible, without sacrificing effectiveness.

In congenital syphilis treatment must be longer, more carefully directed, and the aid of the pediatricist is essential for the best results.

*Special Cases*—In certain cases of syphilis the control, or the amelioration, of symptoms is more important than an effort to "cure" the disease. This is so in certain cases of aortitis and hepatitis. If a patient comes in with aortitis, it is much more important to keep his heart and aorta functioning than it is to cure the syphilis.

*"Nerve" Syphilis*—Syphilis of the nervous system is somewhat a different problem than syphilis in other organs—still the general principles are about the same, except that we are willing to use more drastic measures because of the severity of the involvement. The first attack against nervous system syphilis, when not previously treated, is the general treatment as mentioned. In cases which do not respond we have special measures, such as tryparsamide and fever therapy to fall back upon. These types of treatment should be reserved for the experienced therapist.

*Wassermann-Fast Cases*—One of the most difficult problems for all of us is the symptomless patient with a persistently positive Wassermann reaction. Here I believe a most thorough search for focal evidence should be made. Past treatment should be carefully weighed. Future courses should be mapped out in such a way that the point where treatment will cease is thoroughly impressed upon the patient, and from there on, unless some symptom or finding arises, no further treatment should be administered. The patient becomes an observation case, when what you consider the maximum amount of treatment over a reasonable length of time has been administered. The treatment should never be continued indefinitely just because of a persistently positive Wassermann reaction.

#### GENERALIZATIONS

The earlier the treatment begins, the better is the prognosis. Never wait to begin treatment, once the diagnosis is clearly established, no matter how early the stage of the disease. Early diag-

nosis is usually dependent upon demonstration of the spirochetes by the darkfield, and is the only reliable early diagnostic aid. The darkfield is positive long before the Wassermann reaction becomes positive.

The arsenicals are the most potent drugs in the treatment of syphilis, and no patient who can tolerate arsenic should be denied them in adequate amounts.

Bismuth is a valuable drug and should be combined with the arsenicals. Arsenic plus bismuth has been found more efficacious than arsenic plus mercury. Furthermore, bismuth is much more easily borne.

Mercury still is a valuable drug; especially is the inunction to be recommended for individuals who cannot attend regularly for treatment. For my own part, I prefer to give a series of one drug or the other, not to alternate; but circumstances may make it desirable to administer the drugs in various combinations.

The first year is the golden year in the treatment of syphilis. I believe that if the first year's treatment is carried out with the greatest regularity, relapses will be very few. I think that the patient derives more benefit from the drugs administered during that first year; that, they are better borne; and, aside from intolerances, that there is less chemical damage to the tissues. I presume it is somewhat a matter of saturation and reception.

In administering the arsenicals do everything possible to make the patient tolerate the drug. If he becomes unable to take the arsphenamines his prognosis is not as good. In case of impending intolerance manifest by nausea, etc., try smaller doses, greater dilution, longer intervals, etc.

There is a definite relationship between dosage and curability. Kolle has shown this experimentally.

A physician who is going to treat syphilis must learn the technique. He must have adequate apparatus and, above all else, he must so organize himself, or his force, that treatments can be given without hesitation or delay.

As for drugs. Do not take up with every new brand that is offered. Get your advice from a well established clinic, not from the detail men.

Keep in mind constantly the fact that you are treating an individual infected with a chronic disease, and that the patient must be cured if possible, but he must not be injured by treatment.

Discuss the cost of treatment in courses, not by single injections.

One must be progressive—ever ready to accept new methods or procedures, but only after they have been thoroughly evaluated by people who have the knowledge and opportunity to study them carefully.

Every practitioner who undertakes the treatment of syphilis should know about what the accepted standard of the day is. He should know the dangers of the drugs that he is using, and he should, above all else, know that the patient needs all of the benefits of the art as well as the science of medicine.

## DISCUSSION

DR. JOHN CRAWFORD: Dr. Michelson has covered very thoroughly and has stressed the real points of treatment in syphilis. I was particularly struck with what he said about protecting future generations. When we consider that syphilis is as old as prostitution, and prostitution is as old as the world, and that syphilis caused the Reformation through Henry VIII's syphilis producing abortions in his wives, etc., and when we go all through the history of syphilis and what it has done in the world, it is very, very important.

I think the Doctor brought out one of the strongest points in prenatal care. Our child welfare bureaus will tell us about the treatment of congenital syphilis after the child is born. With the best treatment that you can apply to the congenital syphilitic after it is born, it is a makeshift all throughout our modern civilization. But if we treat them prenatally we may get somewhere. When we come to the treatment of congenital syphilis, let us treat it prenatally rather than postnatally. That I consider one of the most important points.

There are certain points in syphilis that a general practitioner should carry in his mind especially, and

some of the old, old sayings are still pat. One is that an epilepsy occurring after thirty years of age is syphilitic, and we, as general practitioners, should learn the diagnosis of syphilis, because it is the most far-reaching disease that we have today. When you consider that more syphilis is being reported today than scarlet fever, diphtheria, tuberculosis and everything, you must come to the conclusion that it is one of the most serious diseases with which we have to deal.

I would simply stress that no syphilis means the cure of a lot of people who come with aching backs and with a hundred and one different things.

The Doctor has covered the treatment of syphilis thoroughly. I have found some things that are helpful; namely, that a 22-gauge needle an inch and a quarter long and a real short bevel will get you into things that you otherwise would not get into.

Even Dr. Geist the other day said that club-foot is not due to syphilis. I say club-foot or any congenital defect of that nature is syphilitic. Certain cells in our body that produce the ova and the spermatozoa are immortal; they pass down through generations, and the only thing that influences the structure of the protozoon is the syphilitic toxin; it prevents the natural unfolding or enfolding processes in the essential development of the fetus. I have watched fellows that I knew had syphilis years ago, and I have watched their children, and I have seen club-foot, spina bifida, and everything occur in them. I say syphilis is the producer of those congenital defeats. (Applause)

DR. HENRY E. MICHELSON: I want to stress what Dr. Crawford said about treatment of the syphilitic pregnant woman. If there is any one place where we get perfect results it is there. Every pregnant woman should have several Wassermanns done throughout her pregnancy. You must be a little careful about false positives. They do occur occasionally, but if it is persistently positive and there is a shade of doubt, the patient should be treated throughout the pregnancy. The results are very good

## Nutrition in Children of School-age as Encountered in Private Practice\*

FRANK C. NEFF, M.D.

*From the Department of Pediatrics, University of Kansas*

*Kansas City, Kan.*

**M**OST cases of nutritional disturbance seen in private practice are brought to the physician for some other reason, the undernutrition being found by the physical examination which is only incidental to the visit. As an illustration of this there should be mentioned the frequency with which medical advice is sought by the mother because the child has a

poor appetite, or has what is considered to be fever, though the temperature may not go higher than 99.5° F. The failure of the family to recognize nutritional losses may be due to the insidious onset which attracts no attention from those in the home.

The physician may be diverted from a physical examination of the child before him by reason of the particular condition which occasions the

\*Read before the Sioux Valley Medical Association, Sioux City, Iowa, January 26, 1932.

visit. I might mention an instance. A mother brought her little daughter to see me because of some minor complaint. When I called attention to the girl's poor posture, the mother reminded me, rather impatiently, that she didn't come to me about that. The modern parent however is apt to be greatly disturbed because the child fails to eat certain orthodox things, such as those which have become popular through the magazines. A boy that I know who likes to select his own food, and whose parents urge him to eat certain vegetables, says that parents should be required to eat the spinach.

It is fundamental that the nutrition should be kept normal, for it has to do with growth, function, happiness, as well as resistance of the organism to the common ailments. The child's development as well as his illnesses are in the province of the physician.

Much has been written about the nutrition of school children. School lunches have been provided in many cities not only as a convenience but also to furnish one suitable meal at noon for children who come from homes where good food is unknown. Drinking milk at recess is also provided for in some schools. All such efforts are no doubt well-meant, but of more importance is a careful individual examination of the child's health, so as to determine what should be done for the child in the way of care at home.

In the absence of careful medical examinations in the schools because of the scarcity of physicians and funds for such work, lay organizations, school teachers, and nurses, and volunteers have undertaken inspection of our children. They must use simple and easily-applied standards for appraising the condition of large numbers of children. But we know that boys and girls do not have to fit the printed figures for height and weight. Nor are the simple charts in use at schools adequate for determining the nutrition.

When many children are examined, as in school centers, about all that can be attempted is a recording of the size and body-weight, a quick glance at the feet, and an inadequate attempt to look at the teeth and tonsils. If, however, this causes the parents to go to a private physician for a careful examination, the school survey is worth while. But it may serve only to confuse the parent, or to send the child off on a wrong track seeking unnecessary treatment. Some schools go further and attempt to direct the conduct of the child's nutrition from such a meager knowledge of what is needed. Furnish-

ing a bottle of milk or advising that if the tonsils be removed the child will be awarded a nine-point button are not methods which will disclose the real causes of poor health.

The nutrition of school children is best determined by the physician in private practice. I shall try to bring out this need for a careful study of the individual child, rather than for an inspection of children in crowded schools.

*Evidences of Undernutrition.*—Holt stated that neither a standard of health nor an absolute measure of malnutrition is possible. But there are many evidences of nutritional disturbance which make up a complex. The more obvious symptoms are those which concern the body framework. The principal nutritional disturbances of the body framework are:

- Thin or flabby muscles.
- Scarcity of body fat.
- Definite underweight.
- Undersize.
- Thin, hollow chest.
- Retracted or sunken abdomen.
- Acquired hernia.
- Fatigue posture (slumping).
- Round shoulders.
- Lordosis.
- Protruding abdomen.
- Knees, back or semiflexed.
- Flat foot.

There is a word that has come into use to describe normal full tissues; namely, turgor. It is often ascribed to muscles and skin. Turgor is a word used in plant physiology and indicates a condition of "normal tension or rigidity, caused by pressure of the water contents against the elastic cell membrane." Turgor "is essential to growth and the movements of growing organs." The loss of the turgor results in the "wilting" of the plant. Flabby muscles may be due to the atrophy of disuse, and to lack of nourishment as well as to other causes. Disuse (lack of exercise) may come from fatigue following over-exertion as well as from under-nourishment. Lack of exercise and under-appropriation of nutritional material are interdependent. In undernutrition even the visceral musculature is hypotonic—which results in a disturbance of function.

Thin, hollow chest may be congenital, or it may be due to soft bony thorax, prematurity, rickets or poor respiratory ventilation such as adenoids and improper breathing.

While a retracted or sunken abdomen is a

symptom of serious infectious states, it is also a symptom of a general nutritional disturbance. All the structures of the abdomen are involved. The disturbance of tissue tone is reflected in the lowered function and food appropriation.

There are many causes for low deposit of subcutaneous fat, in fact in hard-muscled, active children subcutaneous fat is normally low. It is only in connection with other symptoms of under-nutrition that a low amount of fat is to be considered in the present discussion. When fat is deficient, the body is deprived of its cushioning, space-filling, insulating, fuel-supplying tissue. The child with poor fat is cold, especially if he is inactive and has insufficient appetite. The child with little fat and flabby muscles may develop hernia of the umbilicus and of the groin. Acquired hernia has, therefore, an under-nutritional basis. Its cure in children, as also the cure of rectal prolapse, depends, at least in part, upon the development of supporting fat in the adjacent regions.

The child may be brought in primarily because of the rupture, in which case you may find that poor fat and failing muscles have permitted hernias to develop in the umbilical or inguinal region. In many instances the restoration of the abdominal wall to a normal nutritional state will cure the hernia spontaneously.

The explanation of undersize in ordinary under-nutrition is not easy, because some of the poorest nutritional specimens that one sees may be normal or above normal in height. Waters<sup>1</sup> in experimenting with young animals by restricting the quantity of food, found that there might be a growth in skeletal height, during which time the body-fat steadily disappeared and the muscles wasted. All are agreed that height may go on increasing when the child is definitely losing weight. Some children develop nutritional disturbances after precocious rapid growth. However, a retardation of growth is ordinarily to be expected in nutritional disturbances. There is a metabolic reason for retardation in growth in certain diseased conditions, as in untreated diabetes, where protein is not spared for body growth, or in celiac disease and prolonged intestinal indigestion where fat and minerals are lost in excess from the bowels. It seems possible that not only a smaller amount of nutrient material is appropriated by the body skeleton, but that centers controlling growth may be inhibited by lack of nutrition. In the hypothyroidism of cretinism the child weighs enough for his height but is undersized.

Healthy children have spurts in growth; there are few children who gain steadily from month to month. From five to thirteen years a rough estimation of yearly growth in height is about two inches. There is also the spurt in weight which is seasonal, with little or no gain for several months. I have asked two public schools in Kansas City to give me the records of the weights of unselected school children, taken at the beginning of the year in September, again four months later in January, and finally in May. These are as follows:

GAIN IN WEIGHT AND HEIGHT—SCHOOL YEAR*			
September to January—January to May			
Age 6 to 9 Years	90 Boys	64 Girls	
Average gain in weight first 4 months....	3.22 lbs.	3.63 lbs.	
Average gain in weight second 4 months....	1.57 lbs.	1.27 lbs.	
Average gain in weight for 8 months.....	4.79 lbs.	4.90 lbs.	
Average gain in height first 4 months....	.65 ins.	.57 ins.	
Average gain in height second 4 months....	.72 ins.	.72 ins.	
Average gain in height for 8 months.....	1.37 ins.	1.29 ins.	
*McCoy School.			

From these figures one will see at least, that the increase in weights of children is between two and three times as much during the Fall months as in the Winter. On the other hand, the gain in height is somewhat more in the winter months. The figures of Porter showed that for the six months from May to November there is a greater gain in weight than in the Winter period from November to May.

SCHOOL YEAR GAINS FOR 464 CHILDREN  
Mark Twain School  
58 Pupils in Each Age Group

Age	First 4 Mos.	Second 4 Mos.	Total 8 Mos.
	Lbs.	Lbs.	Lbs.
5-6	2.00	1.64	3.64
6-7	1.95	1.95	3.90
7-8	2.83	2.00	4.83
8-9	3.46	1.65	5.11
9-10	4.05	2.37	6.42
10-11	2.66	2.67	5.33
11-12	4.04	2.82	6.86
12-13	5.51	1.53	7.04

If the above gains are totalled for all ages, it will be seen that during the two four-month periods in the Fall and Winter, the ratio of gaining is as 26.5 is to 16.6.

Assuming that overhousing, absence of sunshine and exposure to numerous infections may play a part in failure to gain weight in the Winter, it would seem that, on general principles, living conditions at the schools should be improved.

*Fatigue Posture.*—A slumping posture, often accompanied by and indicative of fatigue, is frequently seen in American children. Its most common appearance is during school-age and consists of round shoulders, prominent, winged scapulae and a functional kyphosis of the dorsal region of the spine. The child lacks robust-

ness, an evidence of undernutrition. Other symptoms are weak foot, the knees in a position of valgus, semiflexion or hyperextension. The child stands with his head projecting forward. Often the chest is poorly formed, flat or keel-shaped, pigeon-shaped, funnel-shaped. As a compensatory curve there may be lordosis of the lumbar spine. The abdomen in such a case is protruding. The sagging spinal column is the result of muscular insufficiency, especially of the spinal muscles. Constipation is to be expected when there is such muscle imbalance of the abdomen.

THREE-YEAR AVERAGE GAIN—SEPTEMBER TO MAY  
Boys 6 to 9 Years  
McCoy School

Pupil No.	First 4 Mos.	2nd 4 Mos.	Total 8 Mos.
	Lbs.	Lbs.	Lbs.
No. 1	3.42	1.5	4.92
No. 5	2.50	2.25	4.75
No. 8	2.33	1.58	3.91
No. 17	3.42	4.17	7.59
No. 24	.83	1.42	2.25
No. 30	3.25	2.50	5.75
No. 36	4.58	1.25	5.83
No. 40	2.66	2.67	5.33
No. 41	2.66	.67	3.33
	25.65	18.01	
	FOUR-YEAR AVERAGE GAIN		
No. 10	2.75	1.31	4.06
No. 12	4.50	1.87	6.37
No. 14	2.82	.06	2.88
No. 15	2.44	1.43	3.87
No. 21	2.31	.87	3.18
No. 26	3.81	2.94	6.75
	18.63	8.48	

The ratio of the average gain in the two four-months periods: For the 3 years is as 25.6 is to 18; for the 4 years is as 18.63 is to 8.40.

*Basis for estimation of the child's proper weight.*—There has been much discussion of the standards for weight, whether they should be based upon the average for age or for height. Neither one alone is probably accurate, especially when certain racial characteristics are present. In children of school-age it is conceded that the relation of weight to height is the best evidence of proper development, and is the most important. In a tall child, two or more inches above the average figures, it is far more difficult to attain the corresponding weight, than to attain the estimated weight for age. He is probably underweight, if with all his added height, he is below the usual average weight for age. Therefore, if children above average height can attain a weight midway between that for the age and that for the height, it seems to me to be a reasonable and desirable mean. In practice we can seldom attain much better results than that.

*Causes of nutritional disturbances.*—In searching for the etiology of undernutrition there should be a complete physical examination. This should include the search for foci of infection,

the influence of repeated upper respiratory infections, and hyperthyroidism and fever. There should be tuberculin tests and repeated examinations of urine for pus, sugar, albumin. The social and environmental factors as well as the habits, are of importance. Poverty, lack of careful family oversight, insufficient food, inadequate rest and sleep, irregular eating and anorexia from various causes, especially psychologic, are factors which should be considered.

You are familiar with instances of the child who is frail by birth. He has inherited a delicate body and poor resistance from parents who may be poor physical specimens. Such children are nervous, with less than the average resistance to pain. Vitality is low from the start. This may be a congenital inferiority rather than an inherited one; resulting from such causes as prematurity or poor fetal nourishment. The striking feature of the case is that the body weight has always been low, and it is almost impossible to make such a child gain. It must be admitted that there are many children who are far better specimens of physical being than their parents ever were. This may or may not have been due to parental or medical care. Often, however, the child's bodily state resembles the parents. If there is constitutional lack of vigor, the treatment is not so definite nor successful.

*Other evidences of undernutrition.*—There are numerous evidences of undernutrition besides those of the body framework. Some of these are functional. They may either play a part in causing the nutritional disturbance or they may be wholly an effect or symptom.

The skin may be pale, dry or rough. The eyes may be hollow, the hair dry and lusterless. Lack of exercise as well as diminished blood volume flow causes cold extremities. In other children there may be clammy skin and excessive perspiration, in some instances due to thyroid stimulation. The superficial lymph glands are not uncommonly palpable in underweight children.

The appetite may be poor if the child has been sick or having fever. But there is not infrequently a psychological cause for lack of appetite. Experience with children in the home gives one first-hand knowledge that most children do not care for a large variety of food at the same meal. Because the child at the table has this restricted desire for the numerous kinds that adults are in the habit of eating, the mother fears that her child will not get a well-balanced diet. It is therefore necessary in a child's dietary to vary the menu from meal to meal, and day to

day, throughout the week. Children get habits of eating certain foods, and habits of disliking certain ones. There is little chance that a serious deficit will occur in the really hungry child, but the finicky child undoubtedly suffers for certain food elements. Children need a generous proportion of carbohydrates, not only for energy, but because one source of body fat is that which is synthesized<sup>2</sup> from carbohydrate of food. The child can get plenty of fat in these two ways and the ratio between ketogenic and antiketogenic factors is kept in proper balance.

Digestive upsets are to be expected in the individual with hypotonia, because of gastric and intestinal insufficiency. Sleep may be poor with restlessness and nervousness present, because of insufficient nourishment. Some undernourished children show a lack of normal activity, possibly because of easily acquired fatigue. One of the important end results is due to the lack of resistance following exposure, whereby repeated or severe infections are acquired.

Because of long-continued infections, or severe nutritional injury, the mineralization of children's teeth before eruption may be seriously impaired, resulting in crumbling, hypoplastic permanent teeth. A continued poor dietary is now known to favor the development of caries, which can be arrested by feeding an all-around high-calorie, high-vitamin diet.

*Treatment.*—The correction of poor appetite and eating habits will do much for the undernourished child. These are chiefly due to:

(a) Hurried program of the child, late hours, late meals, too complex activities outside of the home and eating between meals.

(b) Psychological influences in the household, such as over-anxiety on the part of the family, overplanning of dietary, urging, scolding, etc. The psychological factor is usually not present in large families because there the child eats to keep the others from taking his share. There is no difficulty in getting the child to eat with his playmates or at the occasional meal at the restaurant. A seeming neglect of the child at the table is a helpful way to stimulate the appetite.

For postural treatment the child must be given attention at home and at school. An eye examination for refractive errors, proper position and lighting for reading and correct seating so that the body will be kept straight is desirable. Gymnastics, only to the extent that the child will be interested and not further fatigued, will go along with proper feeding, hygiene and an increase in nutrition of the entire body. I believe in comfortable supports in the beginning of treatment, using an abdominal girdle, with corset support in the back, and shoulder elastic straps. Posture and gastro-intestinal functions are benefited at once, with improvement of nutrition. I like to give the child a home-made prescription consisting of a small dose of citrate of iron, arsenous acid, and strychnine.

The interest of the school, health authorities and lay organizations in the welfare of school children has increased greatly in the last few years. It is certain that attention to the nutrition is often needed. The tan and vigor acquired by children playing in the summer months are apt to be lost by the time the late winter months have passed. The developing pallor and failure to gain can be ascribed somewhat to the overcrowding of school rooms and the almost constant presence of one or more communicable, upper respiratory infections in the room. It is to be hoped that methods will be found to improve school and home ventilation, that hours in the school room will be shortened and the minutes on the playground lengthened and that the spread of school contagions will be reduced to the minimum. The school year, with its confinement during the sunshiny part of the day, has an influence in furthering nutritional disturbances in children who should be growing normally. Perhaps the rapidly spreading knowledge of the beneficial effects of the sun's ultra-violet rays and how to appropriate vitamins will revolutionize the handling of school children.

<sup>1</sup>Waters, Proc. Soc. Promotion of Agricultural Science, 29; 3, 1908.

<sup>2</sup>Sherman, H. C.: Chemistry of Food and Nutrition, 3d edition, 1926.



## Medical-Social Problems of the Day

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**M**EMBERS of the Aberdeen District Medical Society:

Custom has decreed that the retiring president of our District Medical Society shall discuss some of the economic, political or organization problems of the day as they effect the medical profession as a whole or the local society in particular. It is sad to relate that while the ideas presented are usually well worthwhile, no action is taken and no definite policy followed. I hope that in the presentation of the four subjects I have chosen for discussion enough interest will be aroused that you will formulate some concrete policies and take some definite action.

The first subject, and to my mind, the most important, is that of Veterans' Hospital Legislation. Anyone who has been reading recent issues of the daily newspapers and current magazines must be impressed by the number of articles dealing with this subject. A picture of a fine new Veteran's Hospital in Alabama; announcement of a new hospital in St. Cloud, Minnesota; a picture of a new million-dollar hospital to be built in Florida; and various news stories regarding plans for South Dakota come to my mind. One news item stated that Senator Bulow favored Yankton as the site for a new Veterans' Hospital for South Dakota. Another story quoted Royal C. Johnson, stating that a new addition would be built for the Hot Springs Hospital and that a new Veterans' Hospital would be built in central or northern South Dakota. I have been told that our local Chamber of Commerce, without consulting any of the local members of the medical profession, wired our representatives and senators in Congress, asking them to use their influence to have a Veterans' Hospital built in Aberdeen. Various articles in *The Journal-Lancet*, *The Journal of the American Medical Association*, and lay magazines dealing with this same subject have impressed me that its discussion here is timely.

At the same time one sees headlines such as these: "Treasury Ends Year in Hole," "Treasury Deficit Stands at \$1,385,449,487 for Six Months," "Look for New Revenue," and articles on the

Mellon Plan to increase taxes, which would bring back the nuisance taxes on admissions over ten cents, five per cent tax on automobiles, two and one-half per cent tax on tires and accessories, five per cent on radios, two cents each on checks and drafts, five to ten cents each on telephone and telegraph messages, increased tobacco taxes, and increases in the income taxes and postal rates. These hit all of us. In the face of all this, our own representative in Congress, Royal C. Johnson, remarked, "The treasury deficit will make no difference to the hospitalization board in consideration of the South Dakota situation because money for the building program already has been appropriated."

The chief objection which we have to the present plans for the treatment of veterans is the amendment passed in 1926 which said, in substance, that all veterans will be admitted to Veteran' Hospitals, free of charge, without regard to the nature or origin of their disabilities. I believe all of us will agree that any veteran who can tie up his disability with his service record in any manner, no matter how remotely it may be, is entitled to all of the consideration possible from the Federal Government.

In 1930 approximately 70 per cent of the admissions to Veterans' Hospitals were for disabilities that were not of service origin. The medical council of the Veterans Bureau has estimated that the maximum number of beds needed will be 129,859, on the assumption that veterans of all wars are given a mandatory right to hospitalization. The consummation of this plan would involve the construction of about 103,000 beds in addition to the 25,920 already built, at a cost of approximately \$3,500 per bed. The construction program, therefore, is only 20 per cent complete.

A recent survey made by the American Medical Association shows there were 120,786 vacant beds in general hospitals in the United States in 1930. In addition to this, there was a daily average of 58,615 vacant beds in special hospitals. The construction of Veterans' Hospitals is not necessary on account of the lack of a sufficient number of hospital beds.

As for the local hospital situation, in 1931, St. Luke's Hospital, with a total bed capacity of

\*Read at the Annual Banquet of the Aberdeen District Medical Society, Aberdeen, S. D., January 19, 1932.

125, had one hundred beds for the highest number of patients for one day, representing only 80 per cent capacity. The lowest number of patients for one day was thirty-five. The highest daily average for any one month was 74 plus, the lowest daily average 52 plus. The Lincoln, or Good Samaritan Hospital, has been running on from 10 to 20 per cent capacity for more than a year. Locally, therefore, we have more hospital beds than needed.

In a recent personal communication from Dr. Olin West, secretary of the American Medical Association, he stated that, "The American Medical Association, through its House of Delegates, expressed dissatisfaction with the present plan of medical and hospital service for veterans which involves the building and maintenance of a number of federal hospitals and provides for free medical and hospital service to all veterans, including those whose injuries and disabilities have no connection whatever with war service. The contentions of the Association with respect to the latter phase of the situation, however, received no consideration at the hands of Congress, and the proposal offered in the resolution adopted by the House of Delegates at the recent annual session of the Association, while it may not prove to be possible of general acceptance, will at least serve as the basis for further consideration of the federal program. Under the plan proposed in the resolution, veterans would find it possible to select their own physicians and to receive hospital care in, or near, their own homes rather than be compelled to resort to federal hospitalization far remote, in some instances, from the homes of veterans needing medical and hospital service."

Quoting from the Bulletin of the American Medical Association, "The insurance of benefits proposed in the resolution provides for two forms of benefit: (a) The payment to the veteran of a sum of money per week during any period of total disability (a cash benefit); (b) The payment of a hospital benefit per week during any period of hospital confinement (a hospital benefit).

Each veteran would benefit equally. It applies to all alike. The veteran whose illness does not require hospitalization receives his cash benefit and thus his needs are met. The veteran whose illness does require hospitalization can select the hospital of his preference and, without delay, obtain admission. He can select the type of service which suits his needs; for example, a ward bed or a private room. He can select his doctor. While he is confined in the hospital he will con-

tinue to receive his cash benefit which will take care of the needs of his family.

Under the insurance plan of benefit every veteran shares equally in the benefits. The needs of every disabled veteran would be met regardless of the character of his disability, regardless of his location, regardless of whether the illness requires hospitalization or not, and the cost to the Federal Government would be less.

This insurance plan of benefits to veterans is offered in the interest of all. It is in the interest of veterans primarily. It is in the interest of equality of benefits as between veterans. It is in the interest of economy in governmental expenditures. It is in the interest of democracy in medicine—that system which has brought to the people of the United States the highest type of medical service to be had on earth."

As an editorial in the Minneapolis Journal stated recently, "Democracy has for generations outlined the limits of human aspirations. Unrestricted individualism has provided the incentive of progress, and has laid the foundations for the prosperity of which we dream."

The medical profession should, I believe, discuss this matter and present its views to as many of our individual friends and acquaintances as possible. I believe we should present this proposal and resolution of the American Medical Association to the local American Legion Posts, service clubs, Chambers of Commerce, the press, and elsewhere. I believe that a committee should be appointed to work on this problem in this district, and that resolutions should be drafted and sent to our representatives and senators in Congress, and I earnestly urge such action.

The second subject I wish to discuss is that of the physician as an expert witness. The recent malpractice suit against one of our members brought considerable discussion as to a physician's status as an expert witness. In presenting themselves before the courts as witnesses, medical practitioners may assume the role either of ordinary or expert witnesses. A subpoena is always served upon an ordinary witness and may or may not be issued in the case of the expert.

As ordinary witnesses their testimony must be based entirely on the facts observed by them through their own special senses. As expert witnesses they testify either to the facts gained by themselves through their own examinations or investigations of the case and to the deductions or conclusions which they draw from these facts. And they may be called upon to answer hypo-

tical questions. The ordinary witness is allowed from two dollars to three dollars per day; according to our fee-bill the minimum fee for an expert witness is twenty-five dollars per day.

In the federal courts the practice seems to be that a physician cannot be compelled to testify as an expert unless arrangements have been made to compensate him for his services. In the various states, decisions regarding this point have varied. In South Dakota this question has not been settled so far as I can learn. I have talked this matter over with Judge Van Buren Perry and local attorneys and they do not seem to know. I hope it will not be for a long time, but when the proper opportunity presents itself I would like to see this question carried to the Supreme Court of our state for an opinion, and I would like to see the Aberdeen District Medical Society or the State Medical Association carry a test case to the higher court.

The next subject that comes to my mind is the matter of programs for our District Society meetings. When Dr. Gilbert J. Thomas was out here last fall I talked to him about lining up our society with the Extension Division of the University of Minnesota Medical School. According to reports in *The Journal-Lancet* they conduct short intensive post-graduate courses in various towns at very little expense. I believe this would be very advantageous to all of us, and I hope we can be successful in our efforts along this line. In a recent letter Dr. Thomas stated "I have not completed the revision of the book of lectures for the Extension Division. As soon as I can get this finished I will want to talk to you about lectures in your state."

Another angle regarding local programs is the development and use of speakers from our own Society and other societies in our own state. Having been your secretary for four years and president this last year, I fully realize how difficult it is to arrange an interesting program. I know there are numerous men in our own society and in other societies in the state who could present interesting papers for discussion. The advantages of having South Dakota men is their nearness, economy of expense, and the fact that their problems are more similar to our own. The advantage to the speaker is the undoubted benefit re-

ceived from the preparation of interesting material. I would like to see each district society secretary make up a list of his members willing to present papers at local society meetings and at meetings in other districts. If the State Association secretary would obtain these lists and mail copies to all of the secretaries of the component districts, it would not be so difficult to arrange interesting programs. I urge that our delegates to the State Convention present some such plan to the House of Delegates.

The fourth and last subject, upon which I will dwell but a few minutes, is medical legislation and politics. The Aberdeen District Medical Society being the largest in the state, and having among its members the president and secretary of the State Medical Association, I believe that we as a component society should be united on some definite program, and give the State Association our whole-hearted co-operation and support. Let us have a committee to study state medical legislation go before the State Association meeting; have it present its report and recommendations on the proposed Basic Science Law and other medical legislation, and after a thorough discussion at some spring meeting, we will be in a position for our delegates truly to represent us at the State Convention. Then after the State Association adopts a program let us find out how our own local candidates for the state legislature stand upon the proposed legislation, and we can vote more intelligently next fall. It is too late to approach a legislator after he has been elected and ask him to support some pet medical bill, only to discover that the legislator in question is a Christian Scientist or close relative of some chiropractor. Since this is an election year it behooves us to do some preliminary investigation and apply ourselves with collective effort.

The medical profession is subjected, from the outside, to many harsh and untrue criticisms. Our motives are questioned, even when we are trying to save the public from imposters or from itself. Our opposition to socialistic schemes and legislation makes many enemies for us among the paid uplifters, salaried reformers, fanatics and quacks. In self-defense, therefore, it behooves us to make friends with as many honest organizations and individuals as possible.



## A Consideration of Some Recent Developments in the Study of Endocrine Function\*

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**I**N A field in which the anatomist, biochemist, and physiologist are making important advances, subsequent clinical applications should lag behind sufficiently to insure its safe and sound basis. Only then may critical clinical use be expected to demonstrate correct therapeutic value.

More adequate conception of the endocrine function of the sex glands has come to light. McGee<sup>1</sup> in Koch's laboratory at the University of Chicago in 1927 obtained an active preparation of the male hormone from the bull's testicle, as measured by test method of stimulation of growth of the capon comb. A variety of sources, including the urine of adult men and women have had substances giving the reactions of the male hormone. The gonads are not, however, self-contained as to function, but are dependent upon the secretions from the anterior lobe of the hypophysis for the power to produce germ cells and to provide the male hormone.

Smith<sup>2</sup> has demonstrated that in the adult normal male rat after hypophysectomy, castration changes develop as rapidly as if the testes themselves had been totally removed. All the conditions that, in turn, influence the hypophysis are not known, but Moore<sup>3</sup> and Samuels have demonstrated that inanition induced, both through quantitative and through vitamin B restrictions in diet, lowers the amount of hypophysial secretion available, which in turn results in injury to its hormone-producing capacity and germ-cell activity.

McCallum<sup>4</sup> found that lack of manganese in diet also leads to testicular atrophy, and it has been suggested here also that the hypophysis may be a link in the chain of events. The hormone is not stored in the body, as castration brings retrogressive changes in the accessory organs of reproduction within two or three days. The hypophyseal secretion is without effect on male characters in the absence of testes; hence it exerts its influence by stimulating the activity of the testicle, according to Moore<sup>5</sup>. To introduce a hormone in experimental animals daily injections

are required. Oral administration to the capon in amounts ten times as strong as effective subcutaneous dosage gives very irregular results.

The existence of relationship between the anterior gland and sex disorders has been recognized for years and well described by Cushing<sup>6</sup>. Of five anterior pituitary hormones which have been described, Evans and Simpson<sup>7</sup>, Crew and Wiesner<sup>8</sup>, and Zondek<sup>9</sup> all agree on the action of one that has to do with follicle growth, and of another which is concerned in the process of luteinization; respectively, Prolan A and Prolan B from Zondek's classification. Yet another appears to be essential for ovulation, which Leonard<sup>10</sup> has shown is independent of the follicle stimulating and luteinizing hormone. With the occurrence of pregnancy, large amounts of the pituitary hormones are found in the urine and are the basis of the important Asheim-Zondek pregnancy test. The growth hormone is absent.

With regard to the interaction of the female sex hormones, Allen<sup>11</sup> outlines as follows a conception of their activity: Toward the end of menstruation, rapid growth of the follicles, under stimulation of hormone from the anterior lobe of the hypophysis, induces secretion of theelin to produce the growth phase in the accessory genital organs. Ovulation in women, as judged from recovery of tubal ova, occurs one or two days before the nineteenth day following the onset of the previous menstruation in the regular twenty-seven or twenty-eight-day cycle. Following ovulation, as the ruptured follicle becomes transformed into the corpus luteum, there is continued elaboration of theelin by this tissue. Therefore, theelin from the corpus luteum must enter the blood stream, along with such specific corpus luteum hormones as progesterin, resulting in premenstrual transformation of the endometrium and continued growth of the mammary glands.

Theelin alone of the ovarian hormones seems sufficient to supply the essential mechanism of menstruation. Experimental evidence indicates that the corpus luteum may serve at least four endocrine functions that do not, however, apply to all animals. Theelin, as far as is known, is

\*Read in part before the Carver-Scott County Medical Society, May 12, 1931.

present in the ovarian follicles of all mammals, and progesterin in all of the corpora lutea in part of their functional life. Hisaw's<sup>12</sup> corpus luteum hormone, (relaxin), which causes resorption of the symphysis and relaxation of pelvic ligaments in certain animals, has not been identified in human blood.

Theelin, described by Allen and Doisy<sup>13</sup>, has been the subject of a number of papers concerning its clinical applications. Whitehead<sup>14</sup> and Huddleston tested the oxytocic action of the follicular hormone on the uterus of the guinea pig and found that the more highly purified extract had no effect on unstriated muscle.

Hamblem<sup>15</sup> reports six months clinical experience with the follicular hormone in selected patients. One hundred units were given daily for two weeks, with rest intervals of two weeks. Relief of the subjective symptoms associated with menopause was obtained in eight of thirteen patients. A majority of cases exhibiting primary or secondary amenorrhoea were corrected either with the anterior pituitary hormone alone (obtained for research purposes) or with the follicular hormone. Sevringhaus<sup>16</sup> used theelin in the treatment of the symptoms of menopause in thirty cases, one-half of which had definite psychotic symptoms; eleven of the fifteen showed marked relief of symptoms within a few days. Very recently Novak and Hurd<sup>17</sup> have studied a specially obtained preparation of the luteinizing hormone derived from the urine of pregnant women. Out of fifty-one cases of functional uterine hemorrhage, treatment was successful in checking the bleeding in forty-four.

Acromegaly has long been recognized as due to hyperactivity of the anterior hypophysis, the type of growth or deformity depending upon age of the individual at which the hyperfunction commences. The growth hormone concerned is distinct from the sex hormone, and the urine of pregnancy has not been shown to contain it. Experimentally, Benedict<sup>18</sup> and associates have shown that certain extracts of the pituitary gland produced acromegaly in dogs, and that removal of the pituitary stopped growth. Van Dyke<sup>19</sup> describes a method for the preparation of the growth promoting hormone from animal glands, but as far as is known by the writer, no standardized preparation is available for clinical use.

The active hormone of the adrenal cortex isolated to Pfiffner and Swingle<sup>20</sup> has been studied clinically by Rowntree<sup>21</sup> and others, and has proved effective in the crises of Addison's disease. The rarity of Addison's disease makes

this application relatively infrequent. However, a greater comprehension of diseases of the suprarenal gland may increase its application. Continued study may yet reveal that this link in the endocrine system is of importance in asthenic and psychasthenic states for which no important treatment has been revealed. Ball<sup>22</sup> and Rowntree report cases of tumors of the suprarenal gland and emphasize their frequent association with hypertension, which may be either intermittent or continuous. Removal of the tumor resulted in relief from hypertension in several cases.

Although therapy with thyroid substance has probably reached a wider use than that of other endocrine preparations, and the greater appreciation of thyroid deficiency states is attested to by increased numbers of clinical reports, there is undoubtedly still an inadequate conception of the variety of disturbances that may be associated with diminished oxidative processes, and that respond well to the use of thyroid extract. The study of every fatigue and altered nutritional case, not accounted for by organic disease, should include the thyroid status. Symptomatology may be referred to any system; for instance, recent clinical reports<sup>23, 42</sup> emphasize the gastro-intestinal tract from the viewpoint of hypo and hyperthyroid function. However, the use of thyroid extract for conditions as varied as atrophic rhinitis and leucorrhoea cannot but work harm, unless there is complete diagnostic study and control of therapy from a systematic as well as a local viewpoint. The increase in the metabolic activity of all tissues that follows the use of thyroid extract in deficiency states with low basal metabolism accounts for the beneficial influence of such therapy in certain associated conditions of amenorrhoea, dysmenorrhoea, and sterility, and possibly not its direct endocrine influence.

It is seen that these important contributions have added to the knowledge of the physiology of menstruation, and that the role of the anterior hypophysis in the sexual cycle is emphasized. The clinical application, as suggested by Allen,<sup>25</sup> at the present time would seem to be limited to the treatment of extreme menopause symptoms, either natural or operative, by theelin in diminishing doses after disturbances of the anterior hypophysis and thyroid have been ruled out. Even if stimulation of gonads were advisable, as where secondary sex characteristics are retarded, such therapy must wait until an effective, biologically standardization preparation of the anterior hypo-

physis is available.\* While paucity of results, generally obtained by feeding anterior hypophysis in growth disturbances, is not encouraging, occasional reports of the use of specially prepared substances indicate effectiveness.

Moore<sup>26</sup> reiterates a fact which the clinician should keep in mind, that no endocrine gland has been proved to be stimulated by an internal secretion which the organ itself produces; that administration of sex hormone depresses the sex-stimulating secretion of the anterior lobe of the hypophysis so as to diminish the gonad-stimulating hormones available, and, as a result, injury to the gonads appears in animals.

He also states that the administration of powdered thyroid substance, or the removal of the thyroid, does not modify the endocrine activity of the gonads in animals. In the meanwhile, although the administration of powdered thyroid substance or thyroidectomy does not, in animals, modify the endocrine activities of the gonads, the clinical use of thyroid substances in individuals with lowered oxidative processes, commonly clas-

sified as thyroid deficiency states, will continue to aid, in certain instances, in the restoration of normal menstruation and fecundity. The mechanism by which this occurs may later be elaborated by the physiologist.

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\*A preparation has recently been made available for clinical use.

## Pulpless Tooth Rationalization

ELMER S. BEST, D.D.S.

*Minneapolis, Minn.*

*This is the second of a series of articles written by Dr. Best for the Journal-Lancet on dental disorders which are closely allied with the general health of the individual, and are of especial interest to the physician.*

**P**OSSIBLY no single problem in dentistry has been emotionalized over more than "what to do with the pulpless tooth." Unfortunately, much of the evidence dealing with this matter is merely clinical, consisting largely of superficial observations with little or no experimental or laboratory observations to substantiate the various deductions. Literature, exceedingly verbose, has accumulated, some of it based on these superficial observations, narrowing one's viewpoint and warping one's diagnostic ability. Consequently, there is need of cleansing the air of muddled opinions in order that we may see the present status of this problem in the light of scientifically sound experimental evidence, coupled with complete clinical observations.

Although a few doubts have been brought forth, the consensus of opinion based on good experimental and clinical evidence is that apical

infection is generally a dangerous primary foci and should be eradicated in every case. But the pulpless tooth, revealing radiographically no translucent apical areas which would indicate that bacterial activity had destroyed apical bone tissue, and showing a clean-cut and intact peridental membrane, cannot at the present time be classed with the teeth showing radiographic translucency, although it is known that certain teeth may be radiographically negative and still there may be infection of a non-rarifying variety present. Therefore the physical condition of the patient often indicates the course that should be taken.

Many of these radiographically negative teeth are exceedingly important from a masticatory and aesthetic standpoint, and often can be only poorly supplemented. Many restorations made necessary by removal of innocuous pulpless teeth

have been proven to instigate a definite source of infection by creating unsanitary areas, sometimes developing into pyorrhea conditions. Consequently, radical wholesale extraction has no place in a scientific method of treatment and is noticeably on the decline. A careful and complete diagnosis by an unbiased clinician is greatly needed.

The health and compatibility of the pulpless tooth has scored another point by the recent findings of Earl P. Boulger in his experimentations on the "reactions of rat tissue to implanted root-ends." He endeavors to attack the problem from a biologic standpoint. With complete operative sterility maintained, root ends from healthy, recently-extracted teeth were implanted in the leg muscle-tissue of the rat. No evidence of inflammation was found, and rat tissue proliferated between the crevices, such as between the dentine and cementum, thereby eliminating the possible criticism of "foreign body reaction."

The next problem was to find the reaction to positively infected root ends. Teeth recently extracted with apical infection, as proven by clinical, radiographic and bacteriologic examination, were

implanted in rat tissue. "Microscopic studies of the sectioned rat tissue with these teeth disclosed conclusive evidence of infection." The reaction was very similar to that which takes place in humans wherein teeth with infected pulps are allowed to exist. The evidence here corroborated the findings of such men as Rosenow, Hayden, Price, Lucas and others.

Then followed experiments to find what the reaction would be to pulpless teeth with root canal fillings, with no clinical or radiographic evidence of infection, and also teeth wherein the canals had been infected, but which were treated and filled. The findings here were the same as with the healthy apices that were implanted. No evidence of inflammation or foreign body reaction could be found on sectioning and microscopic examination. Thus it is logical to conclude, even though we are not experimenting with human tissue, that the results found here, together with the numerous other reputable experiments in this field, point to the fact that the pulpless tooth can be, and very often is, a valuable aid to the human mechanism, and is not necessarily a dangerous menace to the individual.

## Most Governments Are Inefficient or Corrupt—Some Are Both

EDWARD H. OCHSNER, M.D.

*Chicago, Ill.*

ONE of the very first questions that naturally arises is: Have any of our governmental agencies so conducted themselves in the past as to make it reasonably safe for us to entrust so stupendous a function as universal social insurance to any branch or department? I maintain that most of our local as well as state governments are inefficient or corrupt, and some are both.

Let anyone who doubts the correctness of this statement spend a little time to look around with a critical eye and observe how most local governments, the various departments of the state in which he lives, and the departments of the federal government are conducted, and I am convinced that he will find more inefficiency than he has ever dreamed could exist. If he does not personally know of corruption and inefficiency in government, let him but scan one single daily newspaper regularly for a month in order to be convinced. And what else can one expect who is at all familiar with politics as it has been played

and managed in these United States in the year 1931—the manner in which most men secure their nominations and later their elections, and to whom they are beholden when they take office?

We have all seen the statement repeatedly in the public press, but have never seen it successfully refuted, that in many of the political subdivisions of our country only sixty per cent of the taxes collected are effectively spent, the remainder being frittered away, wasted or stolen. This inefficiency and corruption is due to many causes of which some of the more important are:

The fact that so far no formula has been discovered according to which the most efficient, honest, industrious and worthy members of the community can be secured for public office. Nor has there been any method devised whereby politics, favoritism, pull, nepotism, waste and graft can be eliminated with even a reasonable degree of certainty. The individual who could solve these two problems would not only be the greatest benefactor of the human race but the

wisest man the world has so far produced. Plato tried to solve this problem twenty-three centuries ago when he wrote his Republic. For a time he actually thought he had found a solution. He prevailed upon the King of Syracuse to adopt his plan and put it into operation. The King tried it for a while, tired of it and sold Plato into slavery. Some good friends ransomed him. After that he was not so sure that his scheme would work in practice. Things are not much different today than they were in the time of Plato. Only worse. Worse because of the increase in population resulting in larger governmental units, the enormous increase in the number of those exercising the franchise, the increase in the percentage number of ignorant voters and the ever increasing astuteness and finesse of our practical politicians.

Inefficiency and corruption is so common that we have become callous to it. We are annoyed by it, we grumble and complain mildly about it, we pay our ever mounting taxes if we have anything with which to pay and "let it go at that." It almost seems as though we humans had adopted David Harum's dog philosophy and were applying it to ourselves. He said:

"A certain amount of fleas is good for a dog, it keeps him from brooding on being a dog."

The best illustration of governmental muddling in general is to be found in the mess most governments of the world have made of themselves during the past twenty years. As examples, we need but call attention to the virtual bankruptcy of Germany and of Austria, the maladministration in Russia, the revolutions in Spain, China, Central and South America, the dictatorships in Poland and Italy and when we come near home, the general lawlessness in the United States with its murders and kidnapping for ransom; conditions in the city of New York as disclosed by the Seabury Investigation; the virtual bankruptcy of Chicago and Philadelphia, and the near bankruptcy of many other governmental units.

Let us study conditions in our own country a little more in detail in order to determine whether it would be wise or even safe to entrust the federal, state and local government or any one of them, with supervision over the private lives of its citizens. (This phase of the problem will be taken up more in detail in the future installments).

## Clinical Pathological Conference

By E. T. BELL, M.D.

Department of Pathology, University of Minnesota  
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The Department of Pathology of the University of Minnesota conducts a course in clinical pathologic conferences. Cases are selected in which a thorough clinical study has been made. Many physicians have expressed interest in this type of study and therefore the Journal-Lancet is publishing a series of these conferences. The clinical data are taken from the hospital records and are given absolutely according to the data on the record. Following the clinical report a summary of the pathologic findings is given and a few comments are made on interesting features of the case.

**AUTOPSY-27-992:** Man, 55, admitted to hospital September 9, 1927, complaining of swelling of the feet and ankles, dyspnea, fatigue, and slight pain in the region of the heart. During the last 3½ months had had dyspnea, especially at night, and had had swelling of the feet when he was up and about. Constipation since the onset of the illness.

Heart was moderately enlarged to both left and right; A2 greater than P2; systolic murmur at apex, transmitted to axilla. Right hydrocele. Temperature normal until September 21 when it gradually rose to 105° at the time of death. Blood pressure readings as follows:

September 11, 184/132  
September 13, 122/128  
September 15, 168/124  
September 21, 150/110  
September 23, 150/110

*Urinalysis*—September 9, specific gravity 1022; albumin +; no casts. September 19, specific gravity, 1020; albumin ++; casts +++++.

White blood cells September 21, 21,000.

Blood chemistry September 21: urea nitrogen 49.4 mg, creatinin 1.8 mg.

On September 17 he coughed up a considerable

amount of bright red blood and the following day complained of pain in his chest. Friction rubs were present on both sides of the chest and there were many rales throughout the chest.

September 21 bronchial breathing was detected over the right middle lobe anteriorly. X-ray examination showed large dense areas of consolidation in the right lower and middle lobes and in the left lower lobe. Death September 23.

*Postmortem Report*—The body of a well developed, well nourished man, weighing about 180 lbs.; slight edema of the ankles; none elsewhere. Abundant subcutaneous and subperitoneal fat. 500 cc of cloudy fluid in the left pleural cavity. The heart beat is 17cm in width and weighs 775 grams. There is very marked hypertrophy of the left ventricle; also hypertrophy of the right ventricle; numerous large mural thrombi in the right auricle; no disease of any of the valves; numerous scars in the myocardium of the left ventricle; marked sclerosis and calcification of the coronary arteries. Numerous hemorrhagic infarcts in the lungs. Kidneys 175 grams and 190 grams; no decrease in thickness of the cortices.

*Diagnoses*—1. Hypertension heart with coronary sclerosis, mural thrombi in the right auricle, and numerous infarcts in the lungs. 2. Suppurative pleuritis of the left chest.

*Comment*—This is an instance of a hypertension heart with relatively little involvement of the kidneys. The hemoptysis was evidently due to infarcts of the lungs. Death was apparently due to cardiac failure.

*Autopsy-28-1018*: A man, 32, came into hospital on July 30, complaining of being sick at his stomach with nausea and vomiting, hiccoughs, and shortness of breath. He said that he had had heart trouble since he was 15 years old, at which time he had an attack of rheumatism. Since that time had noted occasional blood-tinged sputum. In general he had been quite well up to three years ago when he noticed that he became short of breath on the slightest exertion. He had not noticed any cyanosis or edema at that time.

His present illness began on July 25, while at work as a tinsmith. He suddenly became dizzy and very short of breath. His heart was very fast and he described it as pounding against the wall of his chest. He managed to walk to his home which was three blocks distant and then went to bed. From that time he had had nausea and vomiting and had not been able to retain anything in his stomach but water. On the 27th hiccough began and persisted until the time of his entrance. On the 28th he became cyanotic and

believed that the cyanosis cleared up after taking some "heart pills" recommended by a physician. He had had edema since the onset of the present illness, especially noticeable about the ankles and more marked at night. He had had acute swelling of the ankles, redness, tenderness, and severe pain when he was 15 years old. He had an attack of pleuritis early in the present year with pain in the lower right chest and shortness of breath; otherwise past history was negative. He had a brother, age 33, who died of heart trouble at the same hospital four years ago.

On physical examination he was found to have shortness of breath and fever. His forehead perspired profusely and the skin was cold and clammy. Hands and forearms were moderately cyanotic. Marked pyorrhea was noted in the mouth. Venous pulsations were noted in the external jugular vein. There was marked arterial pulsation in the supraclavicular region on each side. The precordium was heaving. The apex beat was visible in the left axillary line. The chest was hyperresonant; the right chest showed decreased breath sounds below the angle of the scapula; there was moderate impairment of resonance, approaching dullness, over the same area. Crepitant rales were noted here also. Apex beat was in the sixth interspace and the heart was markedly enlarged, both to left and right. Rate was 150; totally irregular. There was a presystolic and systolic murmur at the apex. The second pulmonic was greater than the second aortic sound. There was a pulse deficit of 60. Blood pressure was 106/65. The liver was palpable to a finger's breadth above the umbilicus.

The patient was quite drowsy and responded to questions very poorly. His condition became more severe. His hiccough continued and did not respond to sedatives, such as morphine and chloralton. Inhalations of carbon dioxide would relieve the hiccoughing for several hours at a time. On August 5 he was stuporous and at 11:30 P. M. his breathing became very rapid and labored.

His temperature on admission was 97°; two days later it was 101°; it regained normal on the fifth day and then gradually rose to 105° just before death, August 6.

*Postmortem Report*—Very slight edema of the ankles. No fluid in the serous cavities. Heart 17cm transversely and weighing 520 grams; Marked hypertrophy and dilation of the right ventricle; moderate hypertrophy and dilation of the left ventricle; both auricles are markedly di-

*Continued on Page 214*

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**DON'T OVERLOOK THE PATHOLOGICAL CERVIX UTERI**

FOCAL INFECTIONS

Thirty-five years ago, the uterine cervix received so much attention at the hands of ambitious surgeons that trachelorrhaphy was the most common of operations.

Every complaint and discomfort of the multipara was ascribed as due to some denudation, ulceration, laceration or nerve impingement in scar tissue, and it was little wonder that a reaction should take place.

Negation became the order of the day and cervices were forgotten, or, at least, often neglected. The unrelenting search for offending foci of infection that has so assiduously been going on, during the past few years, has again brought it into respectful prominence.

When systemic absorption continues, after the usual seats of such origin have been absolved, attention to a previously unsuspected cervix may yield most surprising and brilliant results.

**SPECIAL PERIODIC PRECARCINOMA EXAMINATIONS**

Lest someone, specializing in periodic examinations should decide to become a superspecialist, by limiting his field of examinations to that of the cervix uteri, we would warn the general practitioner now, that such is quite possible if he is unmindful of his responsibilities along this line.

When we know that cancer may develop where there is, or has been, a mucous membrane abrasion subjected to chronic irritation, from friction or otherwise, we believe it to be the duty of every physician to acquaint his clientele as to the im-

portance of regular examinations of this, to the individual obscure and inaccessible area, even though complaint be absent and symptoms are not manifest.

It would seem, in all fairness, to be the rightful prerogative of the family physician to perform this function, and he should be entitled to the perquisites of such office, if he would but observe, rather than neglect, the opportunities it affords among the apparently well, of his following.

We can see no impropriety in the family physician taking the first steps to arrange for a semi-annual or other periodic examinations of persons whom he has previously attended and who are now approaching the menopause; in fact, their confidence in him during the past would indicate that they were entitled to expect such promptings from him. We believe, furthermore, that such interest shown would receive a much deserved appreciation from all right thinking people. It would do great good in our campaign against malignancy.

**CAUTERIZING THE CERVIX**

The procedure of cauterizing a sloughing carcinomatous cervix has long been a practice of recognized value.

In many benign conditions, where response is not obtained from milder measures, the use of the actual cautery is now very much in vogue.

Simple cauterization in suitable cases of local infection is not only effectual where other remedies fail, but it stimulates reparative processes.

In cases of eversion of the cervix, a favorite procedure consists of making three linear antero-posterior applications to each lip.

We are pleased to note that arrangements are being made to demonstrate, twice daily, the "cauterizing of the cervix" at the next annual meeting of the Minnesota State Medical Association May 23, 24 and 25.

A. E. H.

### CORTIN ALLEVIATES SYMPTOMS OF ADDISON'S DISEASE

We learn with pleasure that the Chancellor's medal, highest award of the University of Buffalo for public service has been conferred upon Frank A. Hartman, Ph.D., one of the discoverers of the cortin treatment for Addison's disease, and a member of the faculty of that school.

Although Dr. Hartman is not an M.D., his four most active associates in this work are.

It has long been known that the adrenals have a very definite relation to Addison's disease and it has now been proven conclusively that an extract of the suprarenal cortex is effective in relieving this disease. To this substance the name cortin has been given.

A. E. H.

## Proceedings of the Minneapolis Clinical Club

Meeting of December 10, 1931

**T**HE regular monthly meeting of the Minneapolis Clinical Club was held on Thursday evening, December 10, 1931, in the lounge of the Medical Arts Building. After dinner, the meeting was called to order by the President, Dr. F. H. K. Schaaf, at 7 p. m.

After a short business meeting, the following scientific program was given.

Dr. A. A. Zierold read the following paper, entitled "Treatment of Brain Injury:"

It is common practice to talk about head injuries in terms of skull fractures when the real concern and interest lies in the degree and extent of brain injury. Localized brain injury does occur, but excepting localized meningeal hemorrhage or pressure caused by bone fragments, localized brain damage is not susceptible to treatment. For the most part, the treatment of brain injury is the treatment of increased intracranial pressure, because it is from unrestrained intracranial pressure that medullary anemia and death results.

In the development of abnormal intracranial pressure there are several constant factors. Within the rigid skull and the inelastic dura, there is contained brain substance, the blood, and the cerebro-spinal fluid. In the absence of any marked deformity of the cranium such as might be occasioned by extra-dural hemorrhage or extensive depression of the skull, abnormal intracranial pressure can only develop by increase in volume of blood, brain, or cerebro-spinal fluid, without compensatory volume decrease in one or more of the elements. The elaboration of the cerebro-spinal fluid is determined by the hydraulic pressure within the arteries, and the osmotic pressure of the blood itself.

Absorption is regulated in the same manner. Under normal conditions, when the intravascular

pressure is increased past a certain point, filtration occurs and there is an increase in the amount of cerebro-spinal fluid. This, in turn, is compensated by a second filtration and osmosis, and equilibrium is maintained. Under abnormal conditions, as a result of inflammation or the extravasation of blood protein, from rupture or abnormally permeable capillaries, into the cerebro-spinal fluid, the osmotic pressure of this fluid rises and prevents absorption. With the increase in volume of cerebro-spinal fluid, there is an attendant rise of intracranial pressure. Dismissing for the moment the idea of inflammation, the most potent factor in the increase of intracranial pressure in brain injury is the liberation of blood protein into the spaces occupied by cerebro-spinal fluid.

The milder cases of brain injury, such as are attended by brief periods of unconsciousness, are attended by slight and transient increase of intracranial pressure. The absence of bleeding in and about the brain substance makes it possible to establish and maintain equilibrium between the fluid within the cranium by the normal processes alone. In the severer cases, in which there has been liberation of blood into the subarachnoid spaces and the substance of the brain, either by laceration of the dura or by contusion or laceration of the brain substance, a condition promptly develops which cannot be compensated in the usual manner.

Bagley has shown clinically and by experimental methods that the presence of blood in the subarachnoid spaces is followed by meningeal irritation and partial occlusion of the arachnoid villi. As a result of this, there is an increased osmotic pressure within the cerebro-spinal fluid and an added mechanical hindrance to its absorption. The consequences of this are an in-

crease in the production of cerebro-spinal fluid, and a decrease in its absorption. The resulting phenomenon is, of course, the marked increase in the intracranial pressure.

To return the intracranial pressure to normal, the excess of cerebro-spinal fluid must be removed, or equilibrium between secretion and absorption must be established. This condition is commonly identified as edema of the brain. It is not probable that edema exists in the brain as a definite cellular or intracellular structural change such as occurs elsewhere. The so-called edema of the brain resulting from acute injury is most probably a perivascular and subarachnoid collection of fluid due to the aforementioned pressure changes occasioned by the extravasation of blood or plasma protein. On this basis then, the previous statement that the treatment of brain injury is the treatment of intracranial pressure, may be further refined and limited.

Exclusive of the few cases of meningeal hemorrhage and external bony pressure, the treatment of acute brain injury is the treatment of hemorrhage into the subarachnoid space. The diagnosis of this condition may be arrived at indirectly by observation of the patient's conscious state and study of his nervous reactions, together with careful scrutiny of the pulse and blood pressure variations, or by more direct and obvious method of lumbar puncture.

A brief period of unconsciousness without local signs, and a prompt return to normal usually characterizes the milder degrees of brain injury such as are termed "concussion." Such observations are usually sufficient to determine the absence of any considerable hemorrhage in and around the brain substance, but are of small value in determining presence or absence of small subarachnoid hemorrhages which may give rise to later symptoms. Persisting deep stages of unconsciousness are usually dependent upon extensive brain damage and continued high intracranial pressure. This naturally assumes the presence of considerable blood in the subarachnoid spaces. Here, however, care must be taken not to confuse aphasia with stupor, as the former frequently occurs in the absence of increased intracranial pressure. The appearance and persistence of the Cushing phenomena of lowered pulse and increased blood pressure signalizes the onset of marked and persisting intracranial pressure.

In this instance again, an increase of intracranial pressure sufficient to cause medullary stimulation assumes the presence of blood in the

subarachnoid space. A study of the pupillary reflexes is of value in determining cortical or peripheral cranial nerve injuries, but affords little of value in determining increased intracranial pressure. The study of retinal blood pressures is of questionable value because of the limits of error in observation. Papilla edema as evidence of intracranial pressure appears too late to be of value in the early stages of injury. The most direct and the most certain evidence of subarachnoid hemorrhage is to be obtained by lumbar puncture.

For years many men, notably Dandy, have inveighed against lumbar puncture, not only as a method of diagnosis, but as a method of treatment. There is no question but that the evidence of increased intracranial pressure may be as well obtained by indirect means and study as by direct observation of the spinal fluid pressure. As this is of secondary importance, it might well be dispensed with on this ground, but for what appears to be the more valuable information, mainly the presence or absence of blood in the subarachnoid space, we have no very good substitute. Furthermore, as little, if any, fluid need be withdrawn for diagnostic purposes, the danger of medullary compression, cortical trauma, and aggravation of hemorrhage are avoided. It is probable that, if limited to the cases of suspected hemorrhage and confined only to diagnostic purposes, spinal puncture is a safe and valuable procedure.

The routine of treatment for brain injury varies considerably with different men and with their individual cases. It is generally agreed that progressive intra-dural hemorrhage requires immediate craniotomy. According to most figures, indications for operation arise in not more than 5 per cent of all cases. It is also generally agreed that depressed skull fractures which do not lacerate the dura or meningeal vessels and which do not constitute any marked deformity, do not require emergency surgery. It has been rather definitely shown that whatever local injury attends upon the depressed skull fracture is incurred at the time of impact, and is not increased or perpetuated by the persistence of the depression. On the other hand, compound fractures of the skull require early attention.

Following the work of Temple Fay, it seems very logical to me that fractures attended by lacerations of the dura should be closed with drainage to allow for the escape of blood, while those with an intact dura may be closed with safety. The treatment of increased intracranial

pressure, however, is upon much more debatable ground. It is probable that spinal drainage is attended by some risk, and there is also a reasonable question as to its efficacy. Inasmuch as the intracranial pressure is increased after injury by reason of the blood in the subarachnoid space, simple drainage of spinal fluid is not adequate unless it removes this blood. That this removal can be accomplished appears highly questionable. On this basis then, spinal puncture as a therapeutic measure, except for occasional emergencies, does not seem to be a procedure of choice.

The exhibition of concentrated salt and glucose solutions by vein, and magnesium sulphate by mouth and rectum, are effective in lowering intracranial pressure inasmuch as they increase the osmotic pressure of the blood during the period of their stay within the vascular system. Unfortunately, the period of relief is short, and equilibrium between blood and cerebro-spinal fluid soon becomes established. For this reason, the method cannot be employed sufficiently often or long to make it a procedure of choice. There remains one method whereby the production of cerebro-spinal fluid may be limited and controlled over a long period of time, and in the face of such pathological and abnormal physiological conditions as exist in serious brain damage. This is the restriction of fluid intake.

All other things being equal, fluid is distributed in the body according to the osmotic tension existing in the various fluids, or parts. If the fluid intake be restricted, the elaboration of cerebro-spinal fluid is correspondingly decreased. In the case of brain injury wherein there is hemorrhage beneath the subarachnoid space, we have interference with absorption as well as production. However difficult it may be for us to change the quality of the cerebro-spinal fluid, either by drainage or other procedure, the quantity produced can be decreased, and the quantity absorbed can be increased by the limitation of the fluid intake. The basal water requirements of the body have as yet not been determined well enough to be reduced to a formula, and treatment must proceed along arbitrary and empirical lines. The patient will tolerate limitation of fluid intake to 600 cc. per twenty-four hours over a considerable period of time. In the majority of cases, the emergency use of hypertonic solutions or of spinal drainage will not be required. In some few cases, however, (probably not to exceed 10 per cent), by reason of the severity and extent of brain damage, the intracranial pressure will be uncontrollable even by these means. In this event, with an

impending anemia of the medullary centers, subtemporal decompression is advisable.

In conclusion let me say that the severer grades of brain injury resolve themselves into treatment of intracranial pressure, and that this intracranial pressure is dependent primarily upon the presence of blood in the subarachnoid space.

#### DISCUSSION

DR. J. C. MICHAEL: I have always felt that the biggest problem in head injuries was primarily that of injury to the brain and disease resulting therefrom, and that the surgical problems were rather minor. I am glad Dr. Zierold has called attention to that fact. During the past year I had occasion to go over all the University autopsies, and I think there were about 6½ per cent of the cases that came to autopsy because of cerebral hemorrhage; the group due to head injuries becoming larger from year to year. I am glad Dr. Zierold called attention to the controversy—there is really a controversy among the neurologists and brain surgeons as to whether it is wise to draw off spinal fluid or not. Doctor Dandy has always advocated that we should not do so; Dr. Bailey and others are quite in favor of it for one reason; because the blood in the spinal fluid does inhibit the normal circulation of the spinal fluid through the villi, and that can be obviated to some extent by rather frequent spinal puncture. I myself can't think of any case in which spinal puncture was followed by any serious consequences. I can see it probably can happen, just as it does in cases of brain tumor, but I can't think of any such experience.

Now, there was another point that I wanted to speak of. It is rather interesting to observe that patients who have received injury to the top of the head tend to have troublesome sequelae; we see them six months or a year after injury, and we find that in the morning they feel fine, but after they are up and around, and towards the middle or afternoon of the day, headache commences. I have seen a number of those cases, and they illustrate, of course, the difficulty the patient has with the normal circulation of spinal fluid into the longitudinal and other sinuses.

DR. ORWOOD J. CAMPBELL: Dr. Zierold has very nicely and scientifically presented the general attitude of nearly all surgeons on the subject of cranial injury, and with all of his ideas I most heartily agree, except that I believe spinal puncture to be a valuable procedure under proper indications.

Years ago Wilensky divided head injuries into three convenient groups, those who are going to die regardless of the type of treatment, those who are going to recover without treatment, and those in which the outcome is determined by the care and skill exercised in their management. It is the latter group with which we are here concerned.

Dr. Zierold listed the indications for operation as: increased intracranial pressure not controlled by simpler methods; extradural hemorrhage, which in degree

sufficient to cause death is rare; and depressed fractures.

To the above indications I would add another. Fracture through the cribriform plate with spinal fluid leak is followed by such a high incidence of meningitis that I believe, after recovery from shock, a frontal bone flap should be raised, the dura sutured if possible and an iodoform gauze drain inserted. It is important to raise all depressed fractures occurring over or near, the motor areas. Over silent areas slight depressions may be left.

Restriction of fluids is an excellent procedure and should be adopted in all cases showing symptoms of increased pressure. I doubt, however, if this measure alone is sufficient to cope with the sudden pressure changes in the more severe cases. Here I should favor the administration of hypertonic solutions intravenously, the most useful of which is probably 50 per cent glucose solution. Failing to control pressure in this manner, I feel that spinal puncture is the next procedure of choice. This should always be done with a manometer to avoid too sudden a drop or too great a reduction from a high level. Granting that a certain incidence of harmful results will occur, I still think it a safer and more conservative measure than decompression, which, except for indications already mentioned above, should only be used when repeated punctures, in conjunction with restriction of fluids or hypertonic solutions, fail to control the intracranial pressure.

DR. H. B. HANNAH: I recall a patient who died as a result of spinal puncture, the sister of a doctor, who was hit by a machine, dragged fifty-five or sixty feet and when brought to the hospital wasn't completely unconscious, but was in more or less of a stupor. There were two or three other medical men there, and I did a puncture, using a mercury manometer. The pressure was up six or seven millimeters of mercury and I had withdrawn 2 cc of spinal fluid. The pressure had dropped one or two millimeters of mercury, and as breathing stopped, she was given artificial respiration for forty-eight hours, finally her lungs filled up and she died. The autopsy showed a clot of blood which had slipped down the foramen magnum, and a very severe laceration of the brain substances was present. And then a few months later I saw a boy, who happened to be a doctor's son here in the city, who had been complaining of severe headache. Three or four days later I did a puncture—the pressure was up—and reduced the pressure very slowly back to normal. He was all right for three or four hours, and then became stuporous, and within a period of twelve to fourteen hours he died. That autopsy did not show any blood clot which had plugged the foramen magnum. It showed an area of the brain had been torn, and, apparently, by reducing the pressure we had permitted bleeding to start up again; there was free blood in the spinal fluid and over the cerebral cortex. So at the present time I feel, when you are doing spinal punctures on head injuries, you should be exceptionally careful as to what you are doing and how you remove the fluid, and also keep in mind that

when you remove fluid, you are giving bleeding a chance to start again.

DR. R. C. WEBB: I have enjoyed Dr. Zierold's presentation very much tonight, and I think I am very much in accord with the method of treatment which he has outlined. If you will rule out the compound fractures and the depressed fractures of the skull, you have an extremely small percentage of the cases left who will survive the initial five or six-hour period and in whom operation is indicated. When a patient receives a head injury he becomes unconscious, that is, if the injury is of sufficient severity, and he becomes quiet, and also automatically restricts his own fluids. After all, nature's method has not been improved upon a great deal, and that is, in substance, the treatment described. The discussion which has arisen here has presented two sides, and I think that the profession in general is very much at variance in their method of treatment. I think it would be a great boon to mankind, in this particular period of fast travel, if we could have some agreement on the methods of treatment. In the State of Washington, where they have State Accident Insurance, the head injury cases all come to the State Accident Board, corresponding to our Industrial Commission, but there are no insurance companies, and the State Accident Board has to take care of the expense. They have a director who recently appointed a commission in this state to work up a set of instructions for the guidance of the doctors throughout the state. I have no doubt that there are those who disagree with the findings of this commission, but it at least gives an opportunity for progress.

The question of treatment should be more standardized than it is. Dr. Dandy says that the ordinary procedure when the doctor has a head injury is immediately to rush him to the hospital, refer him to the X-ray room, take X-rays, and then take him down to his room and do a lumbar puncture. He says that the thing which we wish to combat, the thing which is to be combated is the intracranial hemorrhage, and the more we disturb the patient the more apt we are to have hemorrhage. The X-ray does us no good; the fracture is of no importance. He has not been brought up here to determine whether it is a depressed or compound fracture. The point is as to just what is going on in the brain, and he says that if the doctor would keep this patient quiet, sit down beside him and sit with him for three or four hours, and take his pulse every fifteen minutes, record his respiration at the same time, take his temperature and pulse, and, in addition, record his blood pressure, he would get more information about his patient than he would get from an X-ray—more useful information than he would get by doing a lumbar puncture.

When you do a lumbar puncture to relieve the cerebro-spinal fluid, you permit these freshly bleeding vessels to bleed more, and you perhaps drain off the spinal fluid down in the spinal column, but you do not do the patient as much good as you might think. Furthermore, when you give him intravenous glucose and shrink the brain, you again permit the damaged ves-

sels to bleed into the cranial cavity, whereas if you would keep him quiet and get your X-rays three or four days later and restrict his fluids, you would be accomplishing all the desired features without doing your patient any harm.

In this connection I am going to pass around this report from the State of Washington because I know some of you are interested. The last paragraph of the report I think is particularly valuable. It is rather interesting in that it comes from a state in which there is really a humanitarian effect on the physicians, both in their treatment and in the effect on the patient and his subsequent development. It says, "In each case the physician should be diligent and careful in his examination, guarded in his prognosis, and encouraging in his advice to the patient and relatives, as he is much more liable to do harm by pessimistic than by optimistic views. Yet, he should never permit his optimism to carry him to the point of failure to give the patient more rest and more care than he actually feels is necessary, as he will find that this extra care and rest is worth while in preventing these neuroses, and the time to properly treat them is before they begin."

DR. J. M. HAYES: I enjoyed Dr. Zierold's paper and agree with what he said.

The matter of spinal puncture in these cases is, no doubt, a serious matter, and should be done only after very careful deliberation.

One phase has not been discussed. The great majority of head injuries we see now, especially in auto accidents and the like, are complicated by other injuries. Frequently the other injuries seem more serious and receive attention before the head injuries. Some time ago I saw a case in which the head injury seemed very mild when first seen. The patient had a severe fracture of the femur. The patient was given deep anesthesia and subjected to severe trauma in reducing the fracture. Several hours later the patient showed severe brain symptoms. A decompression was done, but the patient went on to a fatal ending ten or twelve hours later. No doubt the deep anesthesia and severe trauma the patient was subjected to during the reduction of the fracture was an important factor in the fatal termination.

DR. STANLEY R. MANEINER: After hearing Dr. Zierold's very excellent paper this evening, it is particularly interesting to me to note that six or seven years ago I visited Sharpe in New York and became very enthusiastic about his ideas. I discussed his ideas and methods of treatment with some of our prominent men at the time, and they pooh-poohed them vigorously and stated that they believed his statistics were grossly exaggerated. It is interesting to note that his statistics at that time were probably the best in the world for skull fractures and head injuries. He warns against the use of the term "skull fracture" as it is the head injury or really the brain injury that we are treating, and his book is entitled "Brain Injuries." After the purchase of his book and careful study of his methods, I instituted some of his procedures at the General Hos-

pital among which were routine spinal puncture and spinal manometer readings.

The matter of increased intracranial pressure, as emphasized by Dr. Zierold, is one of the strongest points in the methods brought out by Sharpe. He believes that a maintained intracranial pressure of over 16 millimeters, due to acute injury, is bound to produce permanent damage. Those cases which have a maintained increased intracranial pressure are the ones which have postoperative sequelae such as headache, permanent interference with vision, etc. He believes that this increased intracranial pressure must be reduced at any cost, and that the most accurate measure of this condition is through the use of the spinal manometer and ophthalmoscope. It is so often stated that the ophthalmoscope is of no importance, but I fully believe that if we are looking for choke disk, that is undoubtedly the case. However, one must watch for dilatation of the retinal veins and edematous blurring and obscuring of the nasal side of the optic disk, later haziness of the temporal margin, and, still later, a total obscuring of the optic disk. This condition of papillary edema is an early sign and may be detected in the early hours following a brain injury with increased intracranial pressure, provided the ophthalmoscope is used at hourly intervals. While on service at the General Hospital, two cases came under my observation in which we were able to follow the eye findings, and by repeated spinal puncture to check the gradually increasing intracranial pressure which went hand in hand with the patient's loss of consciousness. In both instances subtemporal decompression was done with an immediate reduction of intracranial pressure and an almost immediate return of consciousness. I believe that these are the cases that lie between the two extremes mentioned by Dr. Campbell, the one which is going to die and the one which is going to get well, and it is with this group that we must be particularly concerned. I believe that the additional points so effectively brought out by Dr. Zierold in his paper with reference to the restriction of fluids and the intravenous use of salt and glucose are new additions and of great value.

I would like to conclude by again complementing Dr. Zierold on the excellence of his presentation.

DR. F. H. K. SCHAAF: Examination of the eye ground is of no value in these cases. I had a case this week in which the spinal fluid showed a pressure of 34 millimeters of mercury, but eye men say there is absolutely no demonstrable change in the eye ground at this time.

DR. J. C. MICHAEL: Of course one would always be cautious in withdrawing spinal fluid in head injury cases if one were a proponent of that. I have never seen a fatal result, and I know autopsy data show no impressive figures; we might in a very small number of cases hasten a fatal result, but probably in the large number of cases we can do a lot of good.

DR. EDWARD T. EVANS: At Boston nine years ago I had the care of head injuries grouped on one service under Dr. Munro, for eight months. I got the idea just as they had here, but we have been talking about acute conditions here. What happens when they go out on

the tenth day? We made it a rule down there to let no case actually out of the hospital without a lumbar puncture to rule out persistent intracranial hypertension. Dr. Munro felt very distinctly, after he had followed those cases along, that he had reduced the number of post-traumatic headaches because of the fact that he checked them before they went out, cut the pressure low by repeated punctures if necessary, and did not allow them to be discharged before a return to normal intracranial pressure.

DR. F. H. K. SCHAAF: These patients are frequently discharged too soon. I have seen two cases discharged in from ten to fourteen days who died from hemorrhage in the softened cerebral area directly over the basal fracture. I think this paper has proved extremely valuable to all of us.

DR. J. C. MICHAEL: I think it is generally agreed, as Dr. Evans stated, that ten days in a hospital is too short a period for any head injury. I think that from three to six weeks should be considered a safe minimum.

DR. A. A. ZIEROLD (Closing Discussion): While I appreciate that the subject of head injuries is in its nature controversial, it is gratifying to hear such an extensive discussion with so little actual variance of opinion. There is little that I can add at this time to what has gone before. In answer to Dr. Michael's remark, I would say that the value of spinal drainage depends, first of all, upon the ability to remove blood from the subarachnoid space. As the intracranial pressure may be lowered by other means, its value for this purpose is not so great. I agree with Dr. Campbell that the body of the patient who has sustained a head injury may be in such state of hydration that restriction of fluid intake is ineffective for a rather long period, and that during this interval, emergency measures, such as intravenous administration of hypertonic glucose or, in extreme cases, relief of pressure by spinal drainage, may be necessary. I do not believe that his suggestion of suturing the dura in cases of fractures involving the

cribriform plate is at all reasonable. In fact, this appeals to me as an unduly formidable operation in itself, and not to be considered in the face of any other emergency. Dr. Hannah has, in previous conversations, mentioned the dangers of spinal drainage, and his experience certainly is one worthy of consideration. It emphasizes the fact that spinal puncture for diagnostic purposes is not to be considered upon the same basis as spinal puncture for therapeutic purposes. I believe that Dr. Webb has summarized the situation quite as well as it is possible in his statement that "restriction of fluid is nature's method of treatment."

DR. E. T. EVANS reported two cases of "Aseptic Necrosis of the Head of the Femur Following Trauma." This paper was delivered before the Minneapolis Surgical Society and will be published in their proceedings.

DR. E. S. PLATAU and DR. EARL HENDRICKSON (by invitation) gave a case report on "Sporadic Cretinism and Hypothyroidism in the Newborn," together with lantern slides. (To be published in THE JOURNAL-LANCET.)

#### DISCUSSION

DR. W. D. WHITE: I would like to ask Dr. Platau something about the metabolic test in relation to weight loss, and if the test was applicable only to infants.

DR. E. S. PLATAU: The insensible weight loss method of metabolism determination gives results which correspond almost identically with those obtained by the more difficult conventional (gaseous exchange) method similar to that used in adults. Very accurate scales must be used and the metabolic rate is determined by calculations from the differences in weight over a given period of time, during which all excreta are carefully weighed and taken into account.

H. BRIGHT DORNBLASER, M.D.,  
Secretary.

## Proceedings Minnesota Academy of Medicine

Meeting of December 9, 1931

THE regular monthly meeting of the Minnesota Academy of Medicine was held at the Town & Country Club on Wednesday evening, December 9, 1931. Dinner was served at 7 o'clock, and the meeting was called to order at 8 o'clock by the President, Dr. J. S. Gilfillan.

There were forty-seven members and one guest present.

Minutes of the November meeting were read by the Secretary and approved as read.

The annual election of officers was held, with results as follows:

President . . . Dr. J. C. Litzenberg, Minneapolis.  
Vice-President . . . Dr. C. D. Freeman, St. Paul.  
Secy.-Treas. . . Dr. R. T. LaVake (re-elected).

The scientific program of the evening was as follows.

Dr. A. E. Wilcox (Minneapolis) reported a case of "Traumatic Subcapsular Hemorrhagic Cyst of the Spleen" as follows:

The patient, H. H., age 26, reported July 31, 1931, complaining of pain in the upper left quadrant along the costal margin.

His immediate history was that in the morn-

ing of the above date he was carrying a crate of machinery and struck his left side against the edge of a table. His symptoms did not seem to be severe; in fact, he came in for observation at the insistence of his employer and not on account of the severity of his symptoms. Physical and X-ray examinations were negative, and the condition was considered to be of a trivial nature and diagnosed as a contusion in this area. He continued to work, but reported at the office five times the following month, during which time he was still at work, but complained periodically of some pain in his side.

On September, 14, 1931, in the evening, he noticed for the first time a swelling below the left costal margin, and the pain increased. The following day he reported at the office, at which time a palpable swelling was noted occupying a position below the left costal region. The swelling appeared to be four or five inches in diameter, the mass was tender and marked friction rub was noted on deep breathing and definite dullness on percussion. The mass was smooth and round, but gave to the palpating hand the sense of fluctuation. The clinical impression was enlarged spleen.

X-ray studies were made and the report was as follows:

"Fluoroscopic examination was made of the stomach and duodenum following ingestion of a barium meal. The stomach is displaced markedly towards the right so that it lies almost in the midline, with, also, marked displacement anteriorly by a mass which bulges in the left upper quadrant and which apparently also causes a splinting and elevation of the left diaphragm. The stomach and duodenum otherwise are normal. Films were made of the abdomen with the barium filled stomach. The marked displacement of the stomach is again demonstrated. The mass occupies the entire left half of the abdomen with the stomach displaced well beyond the midline. The kidney shadow can be fairly well made out, although it does appear to be somewhat enlarged. The shadow of the psoas muscle can also be differentiated, but is somewhat over-shadowed by the abdominal mass. The shadow of the spleen cannot be separated from the mass. The nature of the mass cannot be further determined. Its location and possible association with trauma would indicate that it represents a retro-peritoneal hemorrhagic cyst. This type of appearance is occasionally associated with a large hydronephrosis so that the process may be in the perirenal region. I do not think it arises in the spleen.

At twenty-four hours the transverse colon shows marked downward displacement including the splenic flexura. The entire study most strongly suggests a retro-peritoneal mass.

"Conclusions:

1. Large left abdominal mass.
  - a. Possible retro-peritoneal hemorrhagic cyst, with or without involvement of the kidney capsule.
  - b. Possible large hydronephrosis.

"Films were made of the region of the kidneys. The right kidney is entirely within normal limits. The left kidney appears to be definitely enlarged and its outline fuses with the large mass palpable in this region from which its contours cannot be separated. These films show some obliteration of the psoas shadow, but there is no evidence of spasm of the psoas muscle. This study suggests the same conclusions as on the previous examination and most strongly indicates a kidney mass."

On September 17, 1931, the patient was admitted to the hospital. Temperature was normal, pulse 85, respiration 18. Urine was negative. Hemoglobin 70 per cent. Erythrocytes 4,156,000, leucocytes 10,800, P. M. N. 's 70 per cent, large lymphocytes 18 per cent, small lymphocytes 12 per cent. Other general physical examinations appeared to be negative and unimportant.

Revised pre-operative diagnosis were

1. Hemorrhagic cyst of spleen, traumatic
2. Retroperitoneal hemorrhage.
3. Hydronephrosis.

An exploration was advised. Under spinal anesthesia, 200 m.g. novocain supplemented with nitrous oxide, a left rectus incision was made. When the peritoneum was opened a large, smooth, cystic tumor which proved to be the spleen was found. The spleen grossly appeared about the size of an adult's head. There were marked adhesions to the anterior peritoneal wall, diaphragm, omentum, and stomach. These adhesions were carefully separated with considerable difficulty and only after rupturing of the capsule and allowing some of the encysted fluid to escape. The pedicle of the spleen was gradually isolated and ligated in sections with chromic catgut, being careful to avoid important surrounding structures, mainly the tail of the pancreas and stomach. Some of the adhesions bled sufficiently to warrant ligation of the stumps, but in general the field was fairly dry when enucleation was completed. The abdominal wound was closed in tier sutures without drainage, no other pathology having been encountered.

The post-operative period was uneventful, and, with the exception of hypodermoclysis and sedative for pain, no difficulties were encountered. Wound healed by first intention. Patient left the hospital, October 1, 1931, and returned to work November 9th, apparently free from symptoms.

The specimen presented shows a spleen weighing 360 grams, after the fluid was removed. Before the capsule was ruptured, as stated above, the appearance was about the size of an adult's head and undoubtedly contained approximately two quarts of fluid. The capsule is markedly thickened and shows evidence of marked adhesions.

Final impressions were that there has been a contusion of the spleen followed by slow progressive hemorrhage, or that there had been a secondary hemorrhage which accentuated his symptoms at this late date. However, the thickened capsule would suggest that the affair had been slowly progressive from the start.

The patient was of the tall, and markedly asthenic type, in which the spleen may occupy a position below the costal margin, making exposure and susceptibility to trauma more marked.

#### DISCUSSION

DR. F. E. B. FOLEY (St Paul): In the first place I would like to congratulate Dr. Wilcox on two points: first, on the presentation of such an unusual case, and second, on having put the spleen first in the order of possible diagnoses.

I am interested particularly from the standpoint of the differential diagnosis between the condition found by Dr. Wilcox and a process in or about the kidney.

His remarks concerning the roentgenologic examination of the kidney are worthy of some comment. It is said that accumulations around the kidney obliterate the psoas shadow. In twenty-five or thirty cases of perinephric abscess which I have observed, the psoas shadow was obliterated almost regularly. On the other hand, the psoas shadow may be obliterated in the absence of perinephric abscess, inflammation or hemorrhage. Any process that gives an increased density over the psoas border, such as hydronephrosis, renal tumor or solitary cyst, may obliterate the psoas shadow. Finally, the psoas outline may fail to show, even in good films, in the absence of any pathologic process whatever. For these many reasons the sign is of dubious value and not to be relied upon.

The really valuable criterion in differential diagnosis would be a pyelogram. I did not understand that a pyelogram had been made in this case, and without one I rather marvel at Dr. Wilcox's diagnostic acumen in having recognized this as a tumor of the spleen.

DR. IRVINE McQUARRIE (Minneapolis) read his Inaugural Thesis entitled "Some Recent Observations

Regarding the Nature and Treatment of Epilepsy in Children."

"I wish to thank the Academy for the honor of my election to membership. It is a pleasure for one to belong to a group such as this, which is composed of men representing all branches of medicine and surgery."

#### ABSTRACT

The results of some recent studies on the blood lipids and on the mineral and water exchanges in epileptic children were presented. It was shown that under certain conditions cessation of grand mal seizures in severely epileptic children follows the establishment of a deficit in the body water, whereas rehydration rather promptly leads to their recurrence. Data were presented to show that typical seizures can be induced at will in a high percentage of mildly epileptic patients during their usual intervals of freedom from attacks and while they are on relatively high water and low mineral intake by sustained pituitary antidiuresis. Convulsions usually occur under these conditions only after the amount of water retained is equal to from 2 to 5 per cent of the body weight. That dilution of the extracellular body fluids under these conditions is an important factor in the induction of seizures is indicated by the fact that a low mineral intake favors their occurrence, whereas ingestion of just sufficient NaCl to prevent dilution tends to interfere with the reaction.

In one case of severe epilepsy in which seizures were temporarily under control as a result of the dehydration regimen, rehydration was repeatedly found to be accompanied by both a relative and an absolute increase in the excretion of potassium. A reversal of the urinary potassium to sodium ratio regularly appeared even before the seizures occurred. Pituitary antidiuresis accentuated this reaction, whereas luminal had an opposite effect.

While studies on the blood lipids revealed no clear-cut relationship between the occurrence of seizures and the absolute level of either cholesterol or lecithin, they definitely indicated that the lecithin to cholesterol ratio tends to be highest in samples taken nearest to the time of seizures. These data, together with the foregoing, were tentatively interpreted as suggesting that there is an inherent defect in the mechanism for controlling the permeability of the brain cell membranes in epilepsy. Therapeutic implications from such an interpretation were discussed. The circumstance that most of the conditions which favor the occurrence of seizures, such as alkala-

losis, anoxemia, superhydration and excitation, are likewise known to increase cell membrane permeability, and that factors which prevent them, such as sedation and narcosis, cause decrease in permeability, lends support to this general thesis.

## DISCUSSION

DR. E. M. HAMMES (St. Paul): Doctor McQuarrie has presented this interesting experimental work on epilepsy in a most fascinating way. The more I hear about the theories on the etiologic factors in essential epilepsy, the more confused I become.

When Temple Fay brought forth his dehydration treatment, because of increased spinal fluid findings in epilepsy, we felt that at least an important mechanical factor had been solved in this very obscure problem. However, there are so many clinical experiences which are difficult to explain on any of these theories. It is well known fact that an epileptic will be free from convulsions for months and months following some surgical procedure, regardless of what or where the operation was, and then have a recurrence of his convulsions without any apparent cause. Reed of Cincinnati demonstrated that in a large number of epileptics, in whom he removed the colon without obtaining any permanent results.

Furthermore, epileptics frequently have a complete cessation of convulsions for months, with or without treatment, and then suddenly develop a status epilepticus.

It is difficult to explain these facts in any theory that has been suggested. I would like to ask Doctor McQuarrie if his experimental work was limited solely to cases of grand mal, or if some studies have been made in cases where the convulsions were only of the petit mal type.

DR. J. C. MCKINLEY (Minneapolis): I should like to ask Dr. McQuarrie how far he would go in applying his ideas on the etiology of the so-called essential epilepsy to symptomatic epilepsy, that is, to epilepsy secondary to tumors, meningeal inflammations, and things of that sort.

We are to be complimented in having such work as this going on in our community. Whether or not we agree that Dr. McQuarrie has uncovered the true etiologic factors is wholly aside from the question. He is showing us some phenomena of fundamental importance that are going on in our epileptics, and is giving us at least a working hypothesis until sufficient facts can be accumulated to round out our conception of the disease.

DR. McQUARRIE (in closing): Petit mal cases do not seem to behave exactly like the others. So far we have confined our study chiefly to cases predominantly of the grand mal type. In the former a typical attack may occur while the nurse is out of the room for a moment and so may go unobserved, but if a

patient has a grand mal seizure, no doubt exists regarding its occurrence. I am under the impression that the mechanism is somewhat different in these two convulsive reactions. The patients upon whom the effects of the special therapeutic regimen were studied were chiefly those having many convulsions daily, because it is from these alone that one is justified in drawing conclusions unless very long periods of observations are used. What occasionally occurs when a severely epileptic patient is placed upon a forced fluid regimen is a washing out of minerals with a resulting net loss in body water. This effect may be responsible for the decrease in the number of seizures. When water is stored under similar conditions convulsions are likely to recur.

It is true that in occasional instances patients stop having seizures after undergoing operative procedures of various sorts. On the other hand, if one expects such a result with any degree of frequency one is likely to be disappointed. The multiplicity of minor factors which apparently influence the course of this disease cannot be explained until more has been learned regarding its underlying pathological physiology. The permeability of the living cell membrane is not constant, but is known to vary in degree from time to time, probably in accordance with the state of nutrition of the cell, its oxygen supply, the PH of its environment, etc. It is possible that some of the minor provocative factors, such as fright or reflex irritation from certain pathological lesions, influence brain cell permeability in the direction favoring the occurrence of convulsions.

In regard to Dr. McKinley's discussion, he knows much more about that than I do, I am sure. I have no explanation of the fact that some persons have convulsions from head injuries. It is said that epilepsy developed in but 5.4 per cent of the cases of head injury during the war. Since the incidence of epilepsy in the general population is around 0.4 per cent there must be many more persons who have the characteristic underlying defect in their nervous makeup, but who do not have convulsions until they have some brain injury. It is difficult to explain on any other ground the fact that a given circumscribed lesion, such as a brain tumor, abscess or traumatic scar, appears to cause seizures in but a minority of cases.

Dr. F. E. B. Foley (St. Paul) gave a lantern slide talk on "The Embryology and Surgical Correction of Certain Renal Malformations" and reported three cases of horseshoe kidney operated.

Dr. E. A. Boyden of the Department of Anatomy at the University of Minnesota discussed the embryological development of anomalies of the kidney.

The meeting adjourned.

R. T. LAVAKE, M.D., Secretary.

## NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Dr. J. C. Fawcett, Starkweather, N. D., has moved to Devils Lake, and opened offices for general practice.

Plans are under way for the merging of the Wabasha and Winona County, Minn., Medical Societies.

Dr. C. H. Owens, who has been in practice for several years at Garrison, N. D., is now located at Sheyenne, N. D.

Dr. W. P. Thelen has moved from Wilton, N. D., to Stillwater, Minn., where he will continue in general practice.

Dr. J. S. Shrader, who has been in practice for some years at Springfield, Minn., is now located at Wheaton, Minn.

Dr. A. R. Clauser has moved to Madrid, N. M., where he will continue practice. He has been located for several years at Canistota, S. D.

Dr. C. R. Chadbourn, who recently was O. K.'d by the State Board of Examiners, has opened offices for general practice at Heron Lake, Minn.

Dr. P. G. E. Hoeper, formerly in practice at Litchfield, Minn., has moved to Williston, N. D., where he will continue in his professional work.

Dr. W. E. Clark, who practiced in Aberdeen, S. D., for many years, died recently in Los Angeles, from the effects of carbon monoxide poisoning.

Dr. H. T. Petraborg, Stillwater, Minn., has been appointed a member of the medical staff of the Northern Pacific hospital at Glendive, Montana.

Drs. A. S. Hamilton and F. C. Rodda were guest speakers at the thirtieth anniversary meeting of the staff of the Abbott Hospital, Minneapolis last month.

The Hutchinson, Minn., Community Hospital, has recently received a trust fund of \$10,000 to be used for medical, surgical and nursing care for deserving persons of that city.

Dr. Geoffrey Cottam, has opened offices for general practice at Sioux Falls, S. D. Dr. Cottam has recently been associated with the Miller Clinic at St. Paul, as an assistant surgeon.

Dr. H. Kyuno, director of the Municipal Tuberculosis Sanitorium in Yokohama, who is on a world tour, visited tuberculosis sanitoriums in and near the Twin Cities this month.

Dr. J. M. Scanland, who has been at the head of the Montana State Hospital at Warm Springs, has been appointed medical superintendent of the state hospital for the insane at Agnews, Calif.

A verdict in favor of the American Medical Association was returned by a Federal Court jury in the half-million dollar libel suit filed against the association by Norman Baker of Muscatine, Iowa.

Dr. N. W. Spencer, who has been in active practice in South Dakota for over 32 years, died last month at his residence in Sioux Falls, at the age of 57 years. His death was caused from heart trouble.

Dr. J. O. Duguil, who had been in active practice at Springfield, S. D., for over 35 years, died at his home after a brief illness at the age of 69 years. Dr. Duguil was a graduate of Rush Medical College.

At the Annual meeting of the Swift-Kandiyohi Medical Society held at Willmar, Minn., Dr. W. C. Kauffman, Appleton, was elected president, Dr. H. H. Jensen, Atwater, vice president, and Dr. C. L. Scofield, Benson, Secretary.

A new hospital was opened last month at Brownton, Minn., with Dr. D. D. Rempel in charge. This hospital has been completely remodeled and equipped with new furniture, which will be greatly appreciated by the doctors in that section.

Cass County Medical Society, Fargo, N. D., are doing splendid work among the crippled children in all sections of the state. Drs. J. C. Swanson, A. C. Morris and B. K. Kilbourn are among the leading workers in connection with the Elks Lodge.

Dr. J. L. Rothrock, St. Paul, was a guest at a dinner given by the staff members of the Miller Hospital in honor of the many years of active work in that city. Dr. Rothrock gave a very interesting review of his "Forty years practice in that city during those years."

Dr. W. W. Duke of Kansas City, Mo., recently addressed a noon meeting of the Hennepin County Medical Association on "The Dawn of a New Specialty in Medicine—Allergy." The meeting was held at the association's club rooms on the twentieth floor of the Medical Arts building.

The quarterly meeting of the Black Hills Medical Society was held at Lead, S. D., on February 25th, with a large attendance and a fine program as follows being presented, Dr. P. P. Ewald, Lead, "Diabetes"; Dr. F. L. Hummer, Lead, "Acute Endocarditis," and Dr. R. B. Fleeger, Lead, "Fractured Memurs."

Dr. Kenneth Bulkley is the new president of the Minneapolis Surgical society as a result of his election at the Hennepin County Medical Society headquarters recently. Other officers chosen are Dr. Martin Nordland, vice-president; Dr. F. A. Olson, secretary-treasurer; Dr. R. C. Webb, council member for a five-year term, and Dr. E. A. Rignier, council member for a four-year term.

Expansion of the United States Veterans hospitals at Minneapolis and St. Cloud to provide space for 304 additional beds was recently announced. The program calls for the expenditure of \$329,000, of which \$129,000 will be spent on the Fort Snelling hospital, and the balance at St. Cloud. Four new floors in the wing of the main building are contemplated at the Snelling institution.

The cancer institute of University hospital is making Minnesota an outstanding state in the fight against cancer, according to Dr. William A. O'Brien, associate professor of pathology at the University of Minnesota and state chairman of the society for control of the disease. Minnesota lost 3,000 inhabitants through deaths from cancer in 1931, he said, which means that there were approximately four times that many cases existing.

"Dr." Mitchell Jurdy, listed in the Minneapolis City Directory as a Naturopathic Physician entered a plea of guilty to practicing healing without a Basic Science Certificate, before Judge of the District Court at Minneapolis and was sentenced to a term of one year in the City Workhouse and stayed the sentence for one year pending the good behavior of the defendant and his compliance with the Medical Laws of this state. The present charge against Jurdy is based upon the alleged treatment of one Ruth Kleopfert who, it was claimed, had been suffering for some time from epilepsy. Mr. Kleopfert, father of the patient, testified that they met the defendant at the Riley Long Life Health Club where Jurdy lectured. On the date of his sentence Jurdy told the representative of the Minnesota State Board of Medical Examiners that he has severed all connections with the Naturopathic Organization.

The defendant is a young man about 28 years of age, married and the father of one child, his home formerly being in the State of Idaho.

Dean E. P. Lyon of the University of Minnesota was in Chicago recently and warned a group of hospital and public health nurse experts that four times as many nurses as are needed are being trained annually. Private case nurses average five days' work a month in Minneapolis, he said.

#### CLINICAL PATHOLOGICAL CONFERENCE

*Continued from Page 202*

lated; advanced mitral stenosis with calcification of the leaflets; other valves normal; large mural thrombus in the appendage of the right auricle and several mural thrombi in the left auricle, coronary arteries normal. Many infarcts in the lungs; small areas of bronchopneumonia. Marked chronic passive congestion of the lungs, liver, and spleen.

*Diagnoses*—1. Mitral stenosis with hypertrophy and dilation of the heart and auricular thrombosis. 2. General passive congestion with infarcts of the lungs.

*Comment*—This is a typical example of mitral stenosis following an attack of rheumatic fever early in life. Death is due to cardiac failure and caused by mechanical narrowing of the mitral orifice.

E. T. BELL, M.D.

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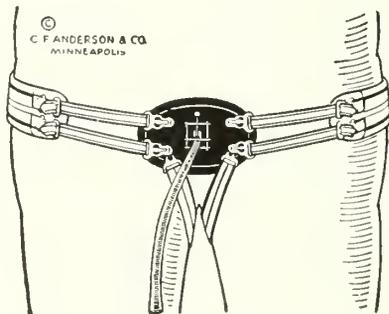
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## Robert Koch and Tuberculosis

KENDALL EMERSON, M.D.

*Managing Director, National Tuberculosis Association  
New York City*

**M**YTH and legend twine about the memory of famous men like trailing vines about an oak. Often the sturdy outlines of the tree are obscured by the less candid, though more delicate tracery of the overgrowth. No such obscuration can threaten in the case of Robert Koch, the discoverer of the tubercle bacillus. In his original paper announcing this discovery, he has given to history a documentation of himself too clear to permit of future misappraisal. It has few equals as a piece of scientific writing and in it the character of the man stands out, clean-cut, incisive, accurate and thorough, both in his thinking and in his manner of work. Knowing the bitter criticism to which he must submit, there is yet no controversial note to be detected, only the argument of relentless logic as he sets forth, step by step, the progress of his experiments, meeting with a scientist's instinct the voice of each critic before it can be raised.

The mighty Virchow, holding views on tuberculosis irreconcilable with those of Koch, sat in the audience as the discoverer, one by one, drove home his points. Though still incredulous, Virchow was dumb. He could marshal no evidence in rebuttal; he could find no joint in the armor to pierce. There was no debate, a most unusual occurrence at a meeting of German scientists, and in their silence his auditors paid their tribute to the measure of the man who had addressed them.

In that day the language of the bacteriologist was comparatively simple. Laymen who would be baffled by the complex terms now in use, can read Koch's paper with understanding and with pleasure. Someone has said that it should be included in text books on the law as an example of logic well worth emulating in legal argument. Koch's fame may justly rest on the discovery which he made, but his true character and greatness appear in the method and manner of his making it.

While a few scientists the world over seized greedily upon the good news, the true significance of this discovery was not generally grasped for some time. Dr. Pratt of Boston cites the amusing instance of a learned American author who, two years after Koch's discovery, wrote, "We know the cause of the disease. It is due to damp soil." News traveled slowly in the early eighties, and professional conservatism was even more marked then than it is now. There were other doubters, but Edward Livingston Trudeau of Saranac was not one of them. At the earliest possible moment he secured from Koch himself a test tube with the living germs in culture, and proceeded himself to cultivate and study these diminutive enemies of mankind. In his autobiography he describes his heartbreaking experience when, a few years later, the laboratory containing the great grandchildren of this original culture was burned, and he lost his entire supply. However, he secured more at once and today

succeeding generations, which have come down in an unbroken line from Koch's original cultures, are still being grown at the Saranac laboratory.

Robert Koch was not only a bacteriologist. He was an epidemiologist as well, and he quickly realized the importance of his discovery as a step toward solving the age-old question of how to control the ravages of tuberculosis among human beings and animals as well. Many years before, Laennec, in the face of almost universal opposition, had claimed that tuberculosis and consumption were the same disease. In 1865, Villemin had proved that tuberculosis was spread from one animal to another by means of an unknown virus. Now Koch had found the actual cause of the infection. In his earliest papers he called attention to the hopeful prospect that we might now look forward with some confidence to the development of an effective means of prevention. And much of his subsequent life was spent in the vain search for a specific cure.

He died with his dream unrealized, and even now, many years later, we must still admit defeat in our attempts to solve this great riddle of pathology. But he lived to impress the truth on a reluctant medical profession and a lethargic public that each new case of tuberculosis comes from an old one, and that prevention can be largely brought about by controlling the spreader of the disease and protecting the uninfected public from contact with the open case.

Later scientific research has taught us another significant fact and one that accounts for the still appalling prevalence of tuberculosis. The disease may exist even in the infectious state without giving symptoms sufficient to interfere seriously with health or the ability of its victim to carry on the ordinary duties of life. This knowledge,

while not as spectacular as the discovery of the germ, has served to redirect our efforts toward the control of tuberculosis. Not only do we know the germ that causes the disease, and that every new case comes from a pre-existing case, but we have also learned how insidiously the bacillus may be spread through a family or a community by the undiscovered open case.

Every case is a link in a chain. It is connected to some previous one from which it derived its infection; if allowed to do so it will infect others still to come. Our immediate task is to break this link and prevent further damage. But in addition it is our duty to go back along the chain and see what former links are still potential foci of infection. In our control methods, of today, as contrasted with those of yesterday, we have but taken the first step when we care for the newly discovered case. The next step is often far more difficult and may lead us along devious paths of productive study. In a research now going forward the immediate families and friends of all the patients in a large sanatorium have just been examined. Among this group of over five hundred people, 7 per cent have been found to be actively tuberculous without having being previously diagnosed.

When Robert Koch grew generation after generation of the tubercle bacilli in test tubes and reproduced the disease at will from any one of these cultures, he taught us that the disease was immortal so long as the germs were passed on by contact from one infected person to another. Only recently have we taken to heart the true significance of his teaching:—that tuberculosis control rests not alone on the treatment of the newly discovered case, but also on an adequate search for the ancestors of that case.

## That Word "Contagious"

H. E. KLEINSCHMIDT, M.D.

*Director, Health Education Service, National Tuberculosis Association  
New York City*

**T**HE word, "contagious," has all but been discarded by health officers and meticulous physicians. It is an example of a good word gone wrong because of the erroneous connotations which have clung to it like barnacles on a ship. The word is derived from the idea of contact, and in that sense is rightly used to de-

scribe most diseases of bacterial origin. Even the ancients noticed that certain diseases were passed from the sick to the well by proximity. The precise mechanism of such transmission they did not understand, and there naturally arose beliefs and theories involving demoniac influences, unseen viruses, and humoral emanations. Gradually the

word "contagious" came to be a synonym for any mysterious poison. Thus, Shakespeare says, "I'll touch my point with this contagion," when he really means "poison." The great bard wrote in an era when the idea of all-pervading miasmata held sway. Hence, we are not surprised at his lines,

"And will he steal out of his wholesome bed  
To dare the vile contagion of the night?"

Such a conception of contagion has persisted in our day, and because it causes unnecessary alarm and much confusion, especially among the lay public, physicians who are the health educators of the people, should encourage the people to understand in what way diseases are transmissible. A patient will ask, "Doctor, is this disease contagious?" A plain "yes" or "no" seldom suffices. The "contagion" of typhoid may have come from an unknown patient many miles up the river, malaria is contagious only via the anopheles, syphilis generally, though not in all cases, through sex contact, and so on. A better answer would be to say that a disease is "communicable," and to explain in what manner it is communicated. This would offset much needless fear and at the same time furnish the questioner with an intelligent basis of conduct.

In tuberculosis work, it is particularly important to clarify to the public what seems such a mystery. In what respect, they wish to know, is tuberculosis contagious? If we could change the word to "contact-uous," our task would be easier because contact is the indispensable factor in the transmission of tuberculosis. That the disease "runs in families" has been folk-lore for generations past. The observation is well supported. Opie, for example, showed that of a large group of children in whose chests tuberculosis lesions were revealed by the X-ray, 80 per cent came from "contact" families. Myers has made a number of notable contributions to medical literature showing how several members of a family may be linked together by the accursed bonds of tuberculosis.

Our more intelligent patients now know that heredity is not responsible for that phenomenon and have learned that close association with an open case accounts for it. They are puzzled, however, when told that many persons are infected with the tubercle bacillus, but that only a fraction of them develop the disease. They fail to appreciate that massiveness and repetition of the bacterial dosage is one of the factors that determine whether or not the infection will eventuate into disease. And too often they overlook the profound influence of environmental factors

which may disturb the fine balance between resistance and infection.

We have, to an encouraging extent, taught the public to discriminate—to be fearless of the disease in some respects and cautious in others. For example, most people no longer treat the consumptive as a pariah, they do not indignantly protest against the erection of a sanatorium in their community, they do not demand fumigation or the "burning of vile incense on the Altar of Ignorance." On the other hand, the people have abolished the common drinking cup, cigars come wrapped in cellophane, and the promiscuous kissing of babies is almost a social faux pas. They are beginning to learn in what respect tuberculosis is "catching."

Careful doctors supply their tuberculous patients with written or printed instructions on how they should care for themselves, how to dispose of sputum, clean the bed linen, wash the dishes, etc. Often the list of "don'ts" is a depressingly long one, but in spite of that, the list is never complete enough. Dr. William F. Snow tells how a young man with dangerous syphilitic mucous patches in his mouth was painstakingly instructed about kissing, sterilizing his dishes, exchanging pencils, and many other contingencies. The doctor's conscience was clear, but when he unexpectedly visited the patient in his home, he found him instructing a younger brother in the art of playing the mouth harmonica! In my opinion, it is better to teach simply and clearly the general biology of the disease, be it syphilis or tuberculosis, the manner in which the germ gets from one person to another, and how it does its deadly work. Give the average person an understanding background and a few specific examples, and he will, himself, regulate his conduct to the best interests of others and his own good.

When a doctor accepts for treatment a case of the communicable disease known as tuberculosis, he assumes also certain obligations not strictly medical. Theoretically, every moment of the patient's life should be under supervision. To what extent should the doctor practice social work in furthering the effectiveness of his diagnostic and therapeutic labors? It was this problem that led Osler in 1893 to employ a young woman medical student to visit his tuberculous patients in their homes. Out of this experiment has grown the public health nursing movement. The public nurse is skilled in interpreting the doctor's instructions and in teaching the patient how to apply to the details of daily living the prophylactic principles outlined by the doctor.

Another obligation is that of urging the exam-

ination of every member of the household, including the grandmother with her "chronic bronchitis," the high school youngster, who may be playing on the football team with a symptomless infiltration of the apex, the kindergarten child, rosy and up-to-weight, but who may already have calcified tracheo-bronchial lymph nodes.

Tuberculosis associations, following a plan adopted some years ago, are this year concentrating their educational efforts on this intricate subject of the "contagiousness" of tuberculosis. Without making use of that word, they are trying to emphasize the communicability of the disease. Under the slogan "Tuberculosis Causes Tuberculosis—Every Case Comes From Another," they are trying to make clear to the public that tuberculosis is communicable by contact with an active case, and what contact means.

They are urging the examination of all mem-

bers of a family wherever tuberculosis is found. Even where there is only a wisp of smoke in the form of latent, symptomless lesions in a child, they are advocating an earnest search for the glowing embers in some other person who is unknowingly disseminating tubercle bacilli. They realize full well that case finding is the technical job of the health officer, doctor, nurse, and to some extent, the social worker, but that the public, too, should know the essential facts so that the doctor and the health officer will not be obstructed in their efforts to break the contact wherever it exists. They are asking of physicians that every case be duly reported so that the detective work of searching out other foci of infection may be facilitated, and they are urging health officials to support doctors in their efforts to neutralize the "contagiousness" of tuberculosis by intelligent and friendly co-operation.

## The Physician and the Family in Tuberculosis Control\*

H. A. BURNS, M.D.

*Superintendent, Minnesota State Sanatorium*

*Ah-Geeah-Ching, Minn.*

**I**MMEDIATELY upon the discovery of pulmonary tuberculosis in a family there arises an urgency for the establishment of a family prophylaxis that exempts no one member. The isolation of the sick one, pending removal to a hospital or sanatorium, should be followed by skin tests of all contacts and X-ray plates of those reacting. With the discovery and isolation of the patient and the identification of the infected contacts, the problem of family prophylaxis begins.

The tragedy of tuberculosis in family life might be minimized, if not wholly averted, could we by an overt act of magic revert in some degree to the practice of the past. It was within the memory of most of us here that the greatest service the physician performed was that of a comforter and consoler. He often sat by the sick bed for hours rendering to a stricken family a service which has since become ignored but not replaced. Private rooms in hospitals with highly trained personnel, visiting and public health nurses, and social workers have all come acclaiming a new era and a better day.

The increase in the development of cult medicine during the past twenty years cannot be ex-

plained through the education of the public in medical problems; neither can this situation be the result of the great progress made during these years through the development of the X-ray, tuberculin, metabolism tests, electrocardiogram, surgical and aseptic techniques, or the progress made in preventive medicine. These and many other advances have helped the progress of medicine from a speculative to a positive science. Greater progress has been made during the past fifty years than was accomplished in any five hundred years before.

As the fruits of medical progress are about to be harvested we see cults multiply with an alarming rapidity. They fill a social need which we have neglected to supply. When our diagnostic and therapeutic acumen can be turned quickly into both results and cash, we have been trained to render effective service, but when there are many other factors involved which delay or prevent either, the interest of the profession is not so easily won or held. The physician has allowed a split to occur in the family's reaction to him since in one instance he takes full responsibility and in the other takes little or no part.

Usually the patients supporting the cult are those who have been neglected by the physician.

\*Presented before the Lymanhurst Medical Staff, October 27, 1931.

Hugh Patrick in his essay. "The Patient himself" says:

"My theme is that much neglected individual, the patient himself. Concerning his organs and their functions, we have numberless tomes. Concerning the diseases that attack his parts, we have whole libraries. Concerning the various ways of cutting him open and sewing him up, there are several six-foot shelves. For the manifold instruments, machines, and appliances of our armamentarium, an extensive congeries of industries are in constant operation. Indeed, some of us are so used to practicing medicine by machinery that the cortical cells bid fair to shrink into sterile desuetude. But of the patient himself—the man, woman, the child—relatively little is thought or written. . . ."

It is a sad commentary on our present educational system that it has become undignified for the physician to give comfort or to extend sympathy to his stricken family. It is a sad commentary upon his schooling to feel that his scientific training denies him the right to kneel in humility at the bedside of his stricken friend and patient. It is saddest of all that present-day medical education raises a barrier between scientific training and human service. Because of a wholly artificial barrier between these two very closely related human emotions and activities, we have denied the family the aid of the best trained mind available in the community—the aid of the family physician. Because the mind and the body of the physician is no longer trained to be the guiding as well as the consoling personality in the tragedy of family illness, others less capable have sought to step into the role and serve as counselor and guide.

This is a long prelude by which an approach is made to a subject never simplified by duplication of work or multiplication of personnel—the obligation of the family physician to his tuberculous patient. In the logical development of the theme, we must return to the status of the physician in the family prophylaxis of tuberculosis.

The physician is the crux upon which the problem is solved for the tuberculous family or upon which it breaks. It is not so much a question of fees as it is salvation that concerns the infected individual as a member of the family unit. Too often in our work we find the physician stepping out, being encouraged to do so, and others only partially trained or untrained anxiously taking up his abandoned duties.

The epidemiologist entering a home for the first time, often finds the physician fully cogni-

zant of the seriousness of the situation, yet reluctant to assert himself in the traditional manner in the care and protection of his family. The family, sensitive to this attitude, withhold a loyalty and an allegiance that should belong alone to the worthy physician.

During the past decade we have spent many millions of dollars in the building and maintenance of institutions where domiciliary, negative sputum, and hilum disease cases of tuberculosis are cared for at public expense, taking out of the family group members that did not constitute a danger to associates and housing them where they were often in contact over prolonged periods of time with those clinically ill.

The prophylaxis of tuberculosis in the family should remain in the family as long as there is a family group. Only the positive sputum cases, under ordinary conditions, need be removed from the family. The responsibility for the care of the remaining members must continue to rest with the family physician. Such exposed families are in need of a great deal of careful supervision if the application of our present knowledge is to be used for the purposes of family protection and tuberculosis control.

The physician must take charge of the family. He cannot with a feeling of relief transfer the obligations that are his to someone less well prepared to serve the family than he. The family is entangled in a complicated and an alarming situation which is medical from every aspect. The physician enters to guide the family to safety. This is scarcely begun by the diagnosis of tuberculosis or the removal of the patient. He has only been given the privilege of looking at the blue-print of tuberculosis control. The vast and alarming campaign of protection and prevention of the family group is not yet even visualized, and will not be without the physician's interested and active participation.

There was a time when the doctor would spend his nights as well as his days with his patients. He may have been prompted to this act because of sympathy. Human interest and concern took the place of a small amount of positive knowledge, and an interest in pathological lesions. These customs of practice should be brought together, rather than to allow one to replace the other.

The doctor is still as much needed in the home as ever, if the knowledge already acquired concerning the control of tuberculosis is to be effectively applied. The doctor who formerly sat by Willie's bed waiting for the fever to break did a real service. Today Willie is infected with

tuberculosis; he does not want to wait until he has a high temperature and is bed-ridden. Willie can escape illness, handicaps, and possibly even death. He does not require the physician's sitting up at night, but he does require guidance and supervision. He requires instructions and leadership in health habits, in mental hygiene, and in the successful carrying out of family prophylaxis. The physician is as essential a part of the family group today as at any time in the past.

No one but the family physician is fitted by training or by understanding to complete the program of prevention in the family. After the return of the member now convalescent to his home, the family physician again must be the dominant factor in the family's struggle against disease and towards re-establishment.

The epidemiologist, the trained public health nurse, and anti-tuberculosis agencies are helpless and ineffective with the family physician a passive observer in futile attempts to rush first aid to the tuberculous family.

We want the family physician to keep his position of adviser and friend in the family. We must expect him to function in behalf of the family willingly and anxiously, and in so doing

he will perform an obligation to his patient, to the family, and to the community that he alone can perform. Let us understand the family doctor's part in tuberculosis control. Without him tuberculosis treatment and control will come into existence through agencies other than those of our own design.

The Minnesota State Sanatorium has devised a program which is considering the control of tuberculosis through family contact as the only logical method of approach. The importance of the family physician is emphasized, and we propose to base our future work upon our convictions that the institution, the family physician, and the infected family are the three interested and effective participants in tuberculosis control.

Without the earnest and enthusiastic co-operation of all these, little besides futile efforts and empty promises can be secured to comfort the future victims of tuberculosis. With the teaching of known and proven knowledge on the part of the medical school, and the constant application of such knowledge to the problem by the physician, the prevalence of tuberculosis as well as deaths resulting from it will diminish in direct ratio to the efforts expended.

## Aims of the Minnesota State Sanatorium Epidemiological Service\*

F. M. FELDMAN, M.D.

*Ah-Gwah-Ching, Minn.*

**T**HE basic aim and duty of every epidemiologist is the prevention of the spread of communicable disease. How this shall be accomplished will necessarily vary with the disease and with the individual situation confronting the epidemiologist. But in general we must prevent contact between the individual who has the disease and those who are susceptible.

We are concerned primarily with tuberculosis. How can we apply the above simple principle? The first problem will be finding the sources of infection, the infected individuals. All of us are aware of the fact that early diagnosis is difficult. A person with tuberculosis need not necessarily lose weight, cough, have hemorrhages, night sweats, or pains in the chest. Sputum may be positive for tubercle bacilli and still be so small in amount as to be unnoticed by the patient.

\*Presented before the Lymanhurst Medical Staff, October 27, 1931.

A large symptomless group is composed of children with hilum disease, although they can be classed, perhaps, only as potential sources of infection.

We are fortunate in that we have two very accurate aids in the determination of tuberculous infection and tuberculous disease. These are the tuberculin skin test, which will detect tuberculous infection, and the X-ray, which will in most cases enable us to say whether tuberculous disease exists or not.

If we could subject every person to a skin test, followed by an X-ray when the skin test was positive, we would find almost every case of tuberculosis and get a strangle hold on the disease.

But we cannot reach every person with this procedure, and even if we did find all of those who are now running loose undiagnosed, we should not have facilities for their care.

There are two other practical approaches to the problem. A representative share of our population can be reached in the schools, and school surveys furnish valuable information. They often point to family sources of infection, as well as discovering cases directly. The chief disadvantage of the method is the time and expense involved for the results usually seen. It is almost always difficult to get satisfactory X-rays on all positive reactors, chiefly because of the expense.

There is another plan of attack which we believe is more direct. Known tuberculosis contacts form the basis for this plan. Reading histories of tuberculosis patients, one is struck by the overwhelming number of cases and deaths among relatives and other close associates. In only very few instances has any intensive study been made to determine that there were no more infected members in the family. It used to be thought that these were safe if none had chest findings on physical examination, but we know better now. Skin tests followed by X-rays of positive reactors are much more reliable.

It becomes apparent that the family physician is the key to the whole situation. He is the one who makes the first diagnosis; he is the one the family depends on for guidance. And it is by aiding the family physician in the management of known contacts that we hope to be of the most service.

Many times it is impossible for him to carry on follow-up work because he is too busy, or because of peculiar family situations. Tuberculosis patients are notoriously fickle in their choice of medical attendants, and travel from one to another with the hope that someone will tell them they really haven't tuberculosis. It is in such instances that the epidemiologist can help the practicing physician, and we are anxious that he take advantage of this service.

As a part of the epidemiological work, we expect to amass tuberculosis statistics, not only from the non-organized counties, but from the whole state. This should help in simplifying and centralizing the tuberculosis problem. We should like to hear the results of any tuberculosis work carried on in the state, and the information we gather will be available for the benefit of future projects.

The Minnesota State Sanatorium serves forty-seven of the eighty-seven counties in the state, a little more than half. The total population of Minnesota is 2,563,953. The population of these counties is 760,263, a little less than one-third.

These unorganized counties which do not sup-

port sanatoria are scattered, a fact which makes the work of the epidemiologist still more difficult.

In view of the large territory to be covered by only one epidemiologist, we believe that his time can be spent more efficiently with known family exposures and contacts. A comprehensive survey is out of the question for the time being. But where local health officials are desirous of carrying out surveys, the epidemiologist will be glad to outline a plan of procedure and help with any difficulties.

In certain state institutions, such as the teachers' colleges, we feel that yearly surveys are not only valuable, but necessary. No teacher should be sent out without reasonable assurance that a tuberculous infection is not present. There are too many instances of teachers breaking down shortly after beginning to teach. Children deserve more protection.

Other institutions should have surveys, too, but in most of them the danger is to a relatively small group.

Except in districts where county sanatorium superintendents have been active in field work, there has been no follow-up work done on reported cases. No one knows how many have moved to other places, in what condition they are, or whether they are exposing others. Among this group of cases no longer under active supervision of the medical profession, there must be a large number of the chronic fibroid type, who feel comparatively well themselves but throw out large numbers of tubercle bacilli for their unsuspecting associates to absorb.

In an attempt to locate a few of these, tuberculosis reports dating back to 1913 were used. All the physicians in a county were interviewed and asked to give what information they could about these reported cases. Where there seemed to be some evidence of family exposure, the epidemiologist visited the family. Occasionally Mantoux tests were done, but more often families were advised to see their family physicians for tests and X-rays.

In Pope county, after deductions for deaths, there are one hundred and twenty-nine reported cases, yet information could be obtained on only sixty-six, about half.

Of this number, thirteen had moved. There were five open cases among the fifty-three remaining, and two of these were taking no precautions to protect large exposed families.

From the above we can see that such an approach is fruitful, but is tedious and slow. Just how we are to reach the heavier sources of infection most efficiently will have to be determined by

trial, but we are sure that there are enough known cases and contacts to occupy the entire time of one epidemiologist. Perhaps we can do more later.

I might summarize the aims of the service as follows:

1. To investigate known contacts.

2. To place contacts and patients under the supervision of their family physician.

3. To carry on surveys and other special work as time permits.

4. To collect data and statistics on tuberculosis, particularly those pertaining to Minnesota.

## The Value of Tuberculin Testing Surveys in Our County Tuberculosis Sanatoria\*

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A GREAT deal of the pioneering necessary to establish the value of tuberculin testing was carried on at our own Lymanhurst school. The work of such men as Rathbun, Chadwick, McCain, and Opie in the East also served to teach us the value of this procedure. When in 1930 this work was adopted by our tuberculosis sanatoria, it was quite generally recognized as a valuable means for detecting early cases of tuberculosis and uncovering sources of infection.

On April 28, 1930, the Minnesota State Board of Control went on record as favoring the use of tuberculin testing surveys throughout our sanatorium districts as a means of saving people from destructive tuberculosis and to help in preventing the wide-spread dissemination of this disease. Accordingly, therefore, they offered to each county tuberculosis sanatorium the sum of six hundred dollars for the completion of a survey to consist of the following:

The tuberculin testing of at least one thousand children, X-raying the positive reactors, and attempting, to the limit of their power, to isolate sources of infection, to hospitalize as early as possible those needing care, and to lay the foundation for a future field service program. It was permissible to carry out the tuberculin testing by either one of two methods. The first consisted of beginning with the tuberculous family and examining as many contacts as possible. To carry this out, it was required that a list of positive sputum cases be obtained from the State Board of Health, and that the families of these be tested, X-rayed, and cared for in a proper manner.

The second method consisted of the school survey. It proved to be the method of choice for the twelve sanatoria that undertook tuberculin

testing surveys. Instructions regarding this work were sent to each institution. They consisted of: (1) A brief review of some of the literature on the subject with a tabulation of the results obtained by various workers. (2) Details as to the organization necessary with which to begin the work. (3) The technique required in the testing—this technique, by the way, was fashioned after the work carried on at Lymanhurst. (4) Requirements necessary to follow in case of the positive reactors. These consisted of a careful history as to exposure, a physical and X-ray examination, and an investigation into home conditions. The necessity of finding and removing sources of infection was emphasized as the main purpose of the survey believing that by so doing the greatest good to the greatest number would eventually result.

It was very encouraging to note the response of the tuberculosis sanatoria to this proposition. Up to the present time, twelve of the fourteen institutions have adopted the work, ten have completed the survey, while two are still in the process of completing it.

The results submitted from the ten sanatoria showed that 23,424 children were tested—16.76 per cent reacted positively. Eighty nine per cent of these were X-rayed; 365 showed evidence of childhood tuberculosis; seventy had adult parenchymal involvement. This gives 10 per cent of those X-rayed as having childhood tuberculosis, and 2 per cent adult tuberculosis. The incidence of childhood tuberculosis in the 23,425 children tested comes to 1.5 per cent, while the amount of adult tuberculosis is 0.3 per cent. We are indebted to the following roentgenologists for the interpretation of most of these films: Dr. Leo Rigler, Dr. John McNutt, Dr. Richard Aurelius, and Dr. Malcom Hanson.

\*Presented before the Lymanhurst Medical Staff, October 27, 1931.

I cannot help but feel that one of the most gratifying features of this initial survey was the result obtained from investigating sources of infection. Two hundred and four old sources were reported and forty-three new and unsuspected ones were uncovered. This total came from six sanatoria. There were four institutions that reported "Still under investigation," so we can well expect to swell the total considerably when their final reports come in. The proper disposal of these cases is now the concern of our sanatoria workers.

We felt that the best proof of the value of this work would be obtained from the opinions given by the sanatoria superintendents who conducted this work. Accordingly, this was asked for on our questionnaires. One hundred per cent of them answered that in their belief this work was exceedingly valuable in the campaign against tuberculosis. I am sure that such unanimous affirmative opinion is testimony that most any business firm would envy. It places the procedure on a rather sound basis.

After reviewing the reports from the various sanatoria, the State Board of Control felt pleased enough with the possibilities of this type of work to offer five hundred dollars a year to each sanatorium that would make this a routine part of their work. The yearly minimum number to be tested was set at 500 instead of one thousand. We are confident that this minimum will be exceeded by every institution, just as was done in the past survey. Our sanatoria, after all, are not so interested in meeting a minimum requirement as they are concerned about complying with a community's need, and so, from year to year, we are hoping to come closer and closer to the goal of an "accredited" group of school children. All of the sanatoria that have completed the ini-

tial survey are interested in continuing this type of work, so unless unforeseen difficulties arise, it seems that it will become a part of the routine practice of our institutions. The school superintendents who, on the whole, have been very cooperative in this movement, have become enthusiastic over the possibilities of tuberculin testing surveys, and they are a most helpful group for a successful carrying on of this work.

The great value of tuberculin testing, as I see it, throughout our sanatorium districts, is that it places the sanatorium on a definitely aggressive basis in the combating of tuberculosis. Supplied as it is with modern knowledge, excellent equipment, and a clear-cut responsibility to the community it serves, the sanatorium is ideally situated for such campaigning against tuberculosis. It can now scientifically search out the treatable case, rather than have the patient, a far-advanced consumptive, seek hope and relief, as a last measure, at the sanatorium door. The establishment of a scientific field-service program will do much toward increasing the value of the sanatorium to the community. Carried out vigorously, it should prove to be our most effective weapon in decreasing the morbidity and mortality rates from tuberculosis.

In carrying out the recent tuberculin testing surveys in our sanatorium districts, much credit is due to the Minnesota Public Health Association for the use of Christmas Seal money to support this work and for its helpful co-operation in other respects. The State Board of Health has been willing at all times to aid in the prosecution of rebellious positive sputum cases. We are also grateful to Dr. J. A. Myers and Dr. H. A. Burns for practical suggestions in the carrying out of this work.

TUBERCULIN TESTING SURVEY  
in  
MINNESOTA SANATORIUM DISTRICTS  
(Incomplete Report)

SANATORIUM	No. Tested	Per Cent Positive	Per Cent X-Rayed*	Childhood Type	Adult Type	Sources of Infection Found	
						Old	New
Novemning							
Schools	1,119	22.00%	95.0%	7	27	Under Investigation	
Clinics and Contacts	587	40.00%	85.0%	18	16	92	20
Lake Julia	1,113	7.40%**	100.0%	22	5	10	1
Otter Tail Co.	1,106	6.00%**	100.0%	43	2	39	0
Ramsey Co. Pav.	1,444	28.80%	93.5%	51	3	Under Investigation	
Riverside	1,001	13.58%	100.0%	9	0	24	2
Sand Beach	1,259	11.00%	93.0%	62	0	21	20
Southwestern	1,066	15.80%	93.0%	22	1	18	0
Sunnyrest	2,813	18.50%	100.0%	75***	6	Under Investigation	
Fair Oaks Lodge	3,710	10.4%	50.0%	19	5		
Glen Lake							
First Round of Examinations	6,013	10.21%	71.30%	36	1	Under Investigation	
Second Round of Examinations	2,193	12.68%		1	4	Under Investigation	
Total for Glen Lake	8,206	10.87%	71.30%	37	5	Under Investigation	
Approximately one-third of these were re-examinations.							
<b>TOTAL</b>	23,424	16.76%	89.16%	365	70	204	43

\*Refers to per cent of positive X-rayed.

\*\*Tests of grade school children accounts for low percentage.

\*\*\*Eight indefinite—Sunnyrest.

## Tuberculosis Control in University of Minnesota Students\*

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COLLEGE students belong to an age group in which tuberculosis is a health problem of paramount importance. This fact has been recognized for many years by physicians engaged in student health work, but the practical problem has been: what can be done about it? Originally it was assumed that practically every student, by the time he or she had reached college age, had had some tuberculous infection, and that those who developed tuberculous disease did so because certain conditions lowered resistance and permitted the quiescent disease process to extend. The importance of early diagnosis was appreciated, both in order that the infected individual might have a good chance of recovery and in order that others might be protected from infection disseminated by the patient. But how, we asked, can we secure early diagnosis?

At the University of Minnesota, serious consideration was given to the tuberculosis problem immediately following the establishment of the Students' Health Service about twelve years ago. During the first year the part-time service of a specialist in tuberculosis, Dr. J. Arthur Myers, was secured, and all physicians on the staff were urged to be constantly on the alert for this disease, both in the routine physical examinations of students and in clinical work in the dispensary; and the importance of fatigue, fever, loss of weight, night sweats, persistent colds, and the supposedly characteristic physical findings in the chest were emphasized.

Students who were suspected of having tuberculosis were referred by the examining physician to the consultant who based his diagnoses mostly upon the history and physical findings, using the x-ray primarily to confirm or disprove his clinical diagnosis. By following this procedure, many cases of active tuberculosis were diagnosed, but the unsatisfactory part of it was that all too many of them were advanced cases and some had tubercle bacilli in the sputum before the diagnosis was made.

As long as eight years ago, the advisability of taking routine x-ray plates of the chest was recognized but the expense seemed prohibitive, particularly in view of the report that routine

chest plates taken of a group of about a hundred students in a midwest university revealed very little of practical importance. It was decided, however, to experiment for a time with the Von Pirquet test in the student group. Much to everyone's surprise, it was found that only about one-third of the students reacted positively to tuberculin. This was valuable information because it indicated that two students out of three whose health was being considered had not been infected with tuberculosis. Furthermore, as the testing project was extended, and a test became positive in a student who had previously had a negative reaction, it indicated that very probably this student had had a tuberculous infection between the dates of the two tests. Gradually the intradermal injection of tuberculin, the so-called Mantoux test, was substituted for the Von Pirquet technique, and since 1928, this test has been a routine part of every physical examination except when students object to it.

In 1929, encouraged by the results obtained by Dr. H. H. Fellows and his associates in the Metropolitan Life Insurance Company, a fluoroscopic examination of the chest was added as a routine part of every physical examination. The purpose of these fluoroscopic examinations has not been to attempt to make diagnoses of tuberculosis, but to select cases for x-ray study. The findings particularly looked for with the fluoroscope are shadows in the parenchyma, calcified areas, unequal aeration or movements of the two sides, obliteration of the costo-phrenic angle, etc. Examiners also are advised that, if tuberculosis is suspected, a negative report should not be given on the basis of the fluoroscopic examination alone. As a result of the addition of the fluoroscope to the examination procedure, there was a great increase in the number of x-ray pictures taken of the chest, and between three and four times as many cases of tuberculous disease were diagnosed as previously.

During this same year it was decided to inaugurate a special study in this field in an attempt to secure accurate information on the following questions: What is the value of the routine x-ray as compared to physical and fluoroscopic examinations of the chest in the early diagnosis of tuberculosis? Do more students in certain

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professional courses, such as nursing and medicine, contract tuberculous infections than students in other courses? And if more of them do contract infections, is this related to any particular part of their training program? And are the students who break down with tuberculous disease the ones who had had previous infections, or the ones who had been previously negative to tuberculin?

The plan according to which this study is being carried out is to examine each year that they are in the University at least two classes of students from the Colleges of Medicine, Nursing and Education. This annual examination includes, in addition to the usual history and physical examination, a Mantoux test, a fluoroscopic and an x-ray examination of the lungs. Although this study will not be completed for approximately two more years, some very interesting observations already have been made in connection with it.

During the present academic year, our program to control tuberculosis has been carried a step further by the addition of routine x-rays of the chests of all the new students who show positive reactions to tuberculin. In addition to these tuberculin tests and x-ray examinations, all of these students are also having the usual physical and fluoroscopic examinations. To date, the examinations of about twenty-five hundred of these new students have been completed, and approximately eight hundred x-rays have been taken. The result has been that fifteen students of this group have been diagnosed as having clinically important tuberculous infiltrations of the lungs. One of these has a far advanced lesion, five have moderately advanced lesions, and nine have minimal tuberculosis. The one student with the far advanced tuberculosis, four of those who were moderately advanced, and two of the incipient cases have discontinued their University work

and placed themselves under intensive treatment. The others are without any symptoms and are continuing their work under the careful supervision of the chest department of the Health Service.

An analysis of the physical findings of these fifteen students on whom diagnoses of tuberculosis have been made indicates that on the basis of physical findings alone, x-ray plates of the chest would have been ordered for only three. On the basis of physical findings, plus histories, five would have had x-ray examinations. On the basis of the fluoroscopic examinations alone, thirteen would have been x-rayed, and on the basis of fluoroscopic examinations and histories, fourteen would have had x-rays taken, even if plates of the chest had not been included as routine procedure this year.

The plans for later follow-up studies on this group of twenty-five hundred students who were examined this year are to retest annually with tuberculin those who show negative reactions at this time, and to re-ray at various intervals those whose x-ray plates reveal shadows at all suspicious of present or potential tuberculosis disease. With the students who enter the University next year, we hope to continue this same procedure of routine tuberculin testing and x-raying of all who show positive reactions. So by the end of the year, we will be able to determine whether this program has enabled us to diagnose in the pre-clinical stage all cases of tuberculous disease, which have developed in these six thousand students. If this can be done, it should be possible by extending such a program to the entire student body, or to any other group of individuals, to diagnose all tuberculosis in its truly curable stage, and to prevent individuals in the group from transmitting the infection to their associates.



## Controlling Tuberculosis in Minnesota

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THE Minnesota Public Health Association in 1932 starts on the second quarter century of its organized campaign against tuberculosis. As a unit of the National Tuberculosis Association this organization derives its support from the sale of Christmas Seals. Its function is largely one of education.

Results of the first twenty-five years of intensive efforts have been tremendously encouraging. The handful of people that formed the nucleus of the organization in 1906 has grown to an army of thousands of devoted, enthusiastic workers throughout the state. Facilities for the treatment and prevention of tuberculosis, entirely lacking at the start, have made Minnesota outstanding in the nation. In the minds of the public has been built up an understanding of the nature of tuberculosis, and of how it can be prevented and cured. The program has been broadened to include many phases of public health work. Within this comparatively short period of time, the tuberculosis death rate in the state has been lowered from 104.93 per 100,000 in 1906 to 48.48 in 1930, while the rate on the estimated population for 1931 is only 41.30.

In the pioneer days, emphasis was placed on arousing the public to the fact that tuberculosis was curable, not hopeless; contagious, not hereditary, and in creating sentiment and securing legislation for the building of sanatoria. The main objective at that time was to protect the family from the far-advanced case of tuberculosis. Later came effort to seek out tuberculosis cases in the incipient stages. Today, with a program to search out threatened children long before they become sick, our campaign has reached its most hopeful phase. This I will enlarge upon later in this article.

Education of the public has been carried on continuously through every possible medium since the work started. Lectures, exhibits, leaflets, newspapers and magazines, motion pictures, posters and billboards, meetings, marionette and Punch and Judy shows, and of late years the radio, have been used extensively in the effort to extend information. Special campaigns, such as the "Fresh Air," "Anti-Spitting," and "Pasteurized Milk," and educational efforts to elimin-

ate the common drinking cup and towel were important phases of the program. Since 1916, a monthly magazine, now known as "Everybody's Health," has been published for the purpose of disseminating authentic facts. The Christmas Seal Sale, conducted annually, is accompanied by a far-reaching campaign of education on tuberculosis.

Our most valuable field of prevention and education is the school. Public health nurses from our staff are available for inspection of school children in communities where this service is not provided. A variety of material to aid and stimulate health instruction is furnished the schools each year. This includes leaflets on various health subjects, classroom growth charts and individual growth graphs, school-room temperature charts, posters, health lessons, reference books and such supplies as room thermometers, individual paper cups and towels, first aid kits, and scales. Among the valuable school projects carried out have been the campaign against diet fads among girls, annual poster contests for grade school children, and high school radio public speaking contests. Speakers and material are also provided for state, district and local teachers' meetings.

Demonstration of needed health activities has an important place in our program. Public health nursing is one of the leading projects of a demonstrational nature, and each year a generous portion of the Christmas Seal funds is used for this phase of our work.

Specific anti-tuberculosis activities which have had a predominating place in the first quarter century have included: chest clinics to seek out patients needing care and to direct them to their family physicians; case-finding tuberculosis surveys; short courses for physicians and nurses; sanatorium follow-up nursing service; and annual early diagnosis campaigns.

Chest clinics are held regularly in the sanatorium districts as a part of the program of the institutions. In the rest of the state they have been financed by Christmas Seal funds. In the case-finding surveys, nurses are sent into a country for the purpose of visiting homes where there is, or has been, an active case of tuberculosis, arranging

examinations for contacts, and carrying on educational work. Demonstration of the importance of sanatorium follow-up nursing service has been a most worthwhile use for Christmas Seal funds. In a number of counties, this service has now been taken over by the sanatorium, while in others the Seal sale fund still helps finance the work.

Short courses or institutes for physicians, inaugurated several years ago for the purpose of keeping the private physician in close touch with the tuberculosis program, have been exceedingly valuable. They are held at the various sanatoria of the state and are limited to twenty-five physicians. In virtually every course held so far, the number of doctors making application has exceeded the number that could be accepted. The program at the institutes includes a discussion of the newer knowledge with emphasis on childhood tuberculosis, tuberculin testing and X-rays; study and discussion of a large number of X-ray pictures; examination of a number of sanatorium patients by the visiting physicians, who are later given an opportunity to check their findings with the X-ray reports of the patients. Throughout the course, the importance of the family physician's continued observation and guidance of patients discharged from the sanatorium as arrested cases and their co-operation in the effort to prevent relapses is urged.

This program has been effective, as results will show, but not effective enough to bring about the complete control of tuberculosis so earnestly sought. But toward the end of the first quarter century came new knowledge, new hope, and new weapons to speed victory. The knowledge concerned tuberculosis in childhood, and the weapons were the Mantoux Tuberculin Test and the X-ray for the discovery of infection.

I have mentioned that the first objective in the early anti-tuberculosis work was to isolate the far-advanced case, and that later came the search for the early case. In today's fight through the tuberculin test and X-ray, we are able to go still farther, and seek out in childhood the person destined to be sick with tuberculosis ten or fifteen years hence if preventive steps are not taken. While all the other types of work which have proven their value through the years will be continued, undoubtedly this new program of testing children will have a dominant place in our future program. Through the sanatoria of the state and the Minnesota Public Health Association, and with the co-operation and approval of County Medical Societies, this work is being extended to communities throughout the state as rapidly as funds permit.

In the majority of the sanatorium districts, extensive programs of testing have been carried out as a part of the program of these institutions, and in these districts more than twenty-five thousand school children have been tested. Christmas Seal funds have aided in this work wherever it was needed, and have carried on a state-wide educational campaign to inform the public concerning the value and purpose of this test.

In surveys carried on outside of sanatorium districts by the Minnesota Public Health Association and its county units, approximately ten thousand school children have been tested. Various methods have been used in these surveys. The usual procedure is for the County Medical Society to arrange a meeting, with tuberculosis and X-ray experts who have had wide experience with the childhood form of the disease, as speakers. The next step is to explain the test to pupils, teachers and parents. This is done by talks at assemblies and at Parent-Teacher meetings, and by the distribution of literature. Consent slips are then sent home with the pupils.

Medical Societies in most of our surveys have preferred to have the testing and reading done by a physician from the outside. Because of the importance of uniformity of X-rays, pictures have been taken at a central place, usually the hospital. Where this was not done, a roentgenologist checked over the various machines to be used and gave instructions so that the conditions would be the same for all the pictures.

When the students have been X-rayed, a second meeting of the medical society is called, with the tuberculosis specialist and roentgenologist again in attendance. At this meeting each X-ray plate is discussed, and the local doctors are given an opportunity to confer with the visiting physicians on their own cases.

Completion of the testing and X-raying does not mean the end of the survey. Remembering that "every case of tuberculosis comes from another," physicians and public health nurses seek the sources of infection. Parents of infected children are advised of the importance of continued observation by the family physician.

A striking example of the value of this test is illustrated by a report from one town in which it was carried out. When the survey was made, X-rays of three high school girls indicated their need for special attention. One with active tuberculosis was sent to the state sanatorium, and after a year's treatment is now back in school. The other two, who were kept under the close observation of their family physicians and carried out a strict health régime, are

both high school seniors this year and apparently in good condition. Two other girls in the teachers' training department in this same school refused to be tested. One of them was taken ill suddenly with tuberculosis about a month later and died in a short time. The following year the other girl broke down with tuberculosis while teaching in a rural school. She has been in bed at her home for over a year and has but slight chances for recovery. It is of significance to note that a member of the faculty of this same school broke down with tuberculosis some months before the test was given.

In a large city survey of senior high school students, three pupils who had been apparently well and active in school life and were to be graduated within a few days, were found to have active tuberculosis. Two of them are now in a sanatorium, and the third is at home under the care of her physician.

Inauguration of testing and X-rays of students at teachers' training colleges is a recent development, and this work is now under way in two schools.

Reactions in the surveys have ranged all the way from one small high school of twenty-seven pupils where 100 per cent reacted negatively to 36 per cent positive reports in another small school. The average has been approximately 25 per cent.

We are fortunate in Minnesota in the close co-operation that exists between the medical profession and the Public Health Association. The headquarters of both state organizations are under the same roof, and activities are closely correlated. The medical profession is represented among the officers, executive committee members, and directors of the Minnesota Public Health Association, and physicians are among the officers in the majority of county associations. All activities of a medical nature are required to have the approval, guidance, and active co-operation of the County Medical Society.

With the exception of Hennepin, Ramsey and St. Louis counties, where Christmas Seals raise sufficient funds to provide for a paid secretary and staff, the state-wide program is carried out under the auspices of county volunteer organizations with the assistance of the state association. In the three large counties, a number of notable pieces of work are carried out in addition to the regular program. Among these are the follow-up service for the Children's Preventorium in St. Paul and a nutrition clinic in the St. Paul public schools, the Rehabilitation Service and Boarding Home of the Hennepin County Tuberculosis Association, and the annual fresh air camp of the St. Louis County Public Health Association.

## Where Is the Other Case?

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"**T**UBERCULOSIS Causes Tuberculosis" is the slogan of the fifth nation-wide campaign to prevent tuberculosis, sponsored by the National Tuberculosis Association. In this article, the physician's part in an effective program of tuberculosis control, is described.

The family doctor holds the key to the solution of the tuberculosis problem.

Tuberculosis tends to "run in families," not, as was formerly believed, because it is inherited, but because it is communicable, especially in the family circle, where contact with the source of infection is fairly constant and prolonged. The disease is transmitted primarily through this intimate and prolonged exposure to an open case. Family associations provide the opportunity for

such exposure. Whenever a case of tuberculosis is discovered, one may as well suspect that there is "another case" in the family.

Every case of tuberculosis should be traced back to its source; otherwise, that source may continue to spread infection to others. Sometimes it is found that a grandparent who has for years worried along with a chronic cough, apologetically referred to as "grandpa's bronchitis," is the real source of infection. Not infrequently, house servants are found to be tuberculous. It is often the case which is not obviously tuberculous, the individual who is apparently in good health, that constitutes the real menace to the household, especially where there are children in the home. It is because tuberculosis may hide behind the mask of outward health, that it is

so dangerous. Long before the disease is actually discovered, untold damage to the health of others may have been done.

Even the most careful questioning of the patient will not always lead to the discovery of unsuspected sources of infection; persistent investigation is necessary. There are still many who regard tuberculosis as a stigma and they are secretive and hesitant about involving other members of their family. Others are unaware of the real source. Every clue should be followed with detective-like persistence until all contacts have been located and the case has been traced back to the other case which is its source.

When a diagnosis of tuberculosis is made, every exposed person in the household should be studied for evidence of infection or disease. The children under 15 years of age, who react positively to the tuberculin test, and all others above that age, should be X-rayed. In no other way can the early forms of the disease be detected. No matter how well nourished and healthy a child may appear to be, if he has lived in contact with a tuberculous person, he should be examined with the tuberculin test and the X-ray.

The practising physician is in a strategic position to aid in the suppression of tuberculosis. By tracing every case back to its source, by promptly reporting each case, to the health department, immediately upon discovery, the physician can break the chain between one case and another case and bring nearer the time when tuberculosis will no longer be the leading cause of death during the first decade of maturity.

"Concerted efforts to reduce the toll of tuberculosis by applying modern methods to 'find the other case' are to be made beginning April 1," Dr. F. E. Harrington, Minneapolis health commissioner, said, in commenting on the early diagnosis campaign program for this year. "This is the scientific way to prevent tuberculosis and one which the Minneapolis health department, through its epidemiological work, has been carrying on for some time. During 1930, there was an increase of 39 per cent in the number of cases of tuberculosis reported in Minneapolis, due to increased public awareness of the importance of promptly reporting every real or suspected case. During the same period, the tuberculosis death rate decreased 16 per cent."

## Progress in the Control of Bovine Tuberculosis

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THE diagnosis of tuberculosis in cattle by means of the tuberculin test has been in progress in this country since 1892. The subcutaneous, or thermic test was the only method used until 1919, when the intradermic method began to be utilized. Gradually the use of the intradermic method increased as experience disclosed that if it was properly made and interpreted, it was more reliable than the subcutaneous test when applied to cattle of all ages and under varied conditions.

The livestock sanitary authorities of some of the eastern states initiated the official tuberculin testing of herds of cattle on request of the owners as early as 1892. The use of the test increased very rapidly from year to year, and cattle owners began to have confidence in this method of eliminating the disease from their herds. The results of subjecting herds of cattle to the tuberculin test disclosed that the test was reliable, and

that herds could be maintained free from the disease.

In the fall of 1917 the Federal Government and a number of the states initiated the plan of state and Federal co-operation for the so-called "eradication" of the disease. The work was limited to the tuberculin testing of individual herds of cattle when the owners agreed to co-operate.

The plan of the control and elimination of the disease by counties, or areas, was initiated in some of the states as early as 1920. Minnesota adopted a law providing for the control and elimination of the disease by counties under the Area Plan in 1923.

The uniform rules and regulations for the Area Plan of control, adopted by the Federal Bureau of Animal Industry and the livestock sanitary authorities of every state in the union, provide that if a complete test of all the cattle in a county discloses a percentage of one per cent or

more, a second complete test of all the cattle shall be made a year thereafter. If the test discloses a percentage of less than one per cent, the infected herds shall be retested until the percentage of infection in the entire county is reduced to five-tenths of one per cent or less, when the county will be officially designated as a Modified Accredited Tuberculosis-Free Area for a period of three years. When any test discloses a percentage of less than one per cent, a quarantine of the infected herds is established in order to prevent the owners from selling cattle to be added to herds that have passed completely negative tests. The state continues to retest all herds in which infection has been disclosed each one hundred and twenty days until every herd in the county has passed at least one completely negative test.

When the control of tuberculosis under the Area Plan is initiated in a county, a modified quarantine is established which requires that all cattle, before importation into such counties, shall have passed a satisfactory tuberculin test. The rules also provide that after a county has been officially designated as a Modified Accredited Tuberculosis-Free Area, the imported cattle, unless they originate from officially accredited areas or herds, must pass a satisfactory tuberculin test before entry, or they must be placed under quarantine and subjected to a retest before they can be permitted to associate with the herds of cattle in such counties. The uniform rules and regulations further provide for the necessary tuberculin retests after the expiration of the three-year period of the official accreditation of the county, in order that such counties can be continued as accredited areas.

Prior to the time the Area Plan of Control was initiated, sufficient tests had been applied in all of the states to determine a fairly reliable estimate of the incidence of bovine tuberculosis. This preliminary work disclosed that the disease existed to a much higher percentage in the eastern and northeastern states, for the reason that the pure-bred dairy herds had been improved by the importation of registered cattle from foreign countries. The disease is estimated to exist in approximately 25 per cent of the cattle of the leading countries of Europe—and in some of them it is known to exist in 50 per cent of the cattle. It is so prevalent in European countries that little has been done to eliminate the disease because of its high cost. As the area work progressed, it was disclosed that in practically every state the highest percentage of reactors is found in herds and in areas where the importation of cattle from the older eastern states and foreign countries have

been made. The work has also shown that in a few counties in the extreme eastern states the first test of all the cattle was over 50 per cent.

On January 1, 1932, the District of Columbia, the states of North Carolina, Maine, Michigan, Indiana, Ohio and Wisconsin were officially designated as Modified Accredited Tuberculosis-Free Areas. All but five of the counties in North Dakota are accredited, and it is expected the state will be completely accredited within a few months. Thirty-nine of the forty-four counties in Idaho, seventy-nine of the hundred and two counties in Illinois, twenty-six of the thirty-nine counties in Washington, sixty-nine of the ninety-nine counties in Iowa, and six of the sixty-nine counties in South Dakota are accredited. There are six other states in which more than 50 per cent of the counties are accredited.

In the United States there are 3,072 counties, and of these, 1,309, or 42.6 per cent, have been officially designated as Modified Accredited Tuberculosis-Free Areas. In the officially accredited counties, and the counties that are under supervision and in the process of accreditation, there are 3,428,707 herds composed of 31,416,604 cattle. These counties have 50 per cent of the cattle population of the territory in the United States which is most heavily infected. The remaining areas are known to contain less than one-half of one per cent infection.

The results of the tuberculin testing under the Area Plan have disclosed a steady decline of the percentage of infection from year to year. In 1922 when the first general survey was made to estimate the extent of tuberculosis in the United States, it was found that the disease existed in approximately 4 per cent as compared with about 1.7 per cent disclosed in the official work at the present time. The percentage of infection in the southern states is comparatively very small for the reason that there have been very few importations of cattle from the foreign countries or northern states. The reason for the few importations was the existence of Texas fever to which northern imported cattle would succumb on arrival. As a result of the concerted work in the control and elimination of the Texas fever tick by the Federal Government and the various states, the disease has been practically eliminated from the cattle in the southern states, and since that time the states have prevented importations of cattle unless they have passed satisfactory negative tuberculin tests. The percentage of tuberculosis in the strictly range and semi-range states is also comparatively small.

Cattle reacting to the tuberculin test must be

slaughtered at plants where the Federal Bureau of Animal Industry maintains post-mortem inspection.

The owner receives the amount of the salvage of the carcass of the animal and also receives indemnity from the state and Federal Government. The amount of the indemnity varies in the different states. In Minnesota the law provides that the value of reacting cattle shall be agreed upon by the veterinarian employed by the state and the owner and if they cannot agree an appraisal board shall be named, one member of which shall be appointed by the owner, one by the state, and a third selected by the other two. The owner receives from the state one-third of the difference between the appraisal or agreed value and the amount he receives as salvage for the carcass, and also one-third of this difference from the Federal Government. The state also pays the shipping expenses.

The state law providing for the area control of tuberculosis in cattle in the states of Illinois and Iowa requires the Boards of County Commissioners of the various counties to appropriate money, when ordered by the livestock sanitary officials of the state, for the payment of indemnity on tuberculous cattle, and also to assist in the payment of the cost of the expense of the testing. The law of the state of Indiana provides that if the cattle in two contiguous counties have been tested, the county shall make the necessary appropriations when ordered by the state authorities.

The law enacted by the Minnesota legislature in 1923 provided that, on petition of the majority of cattle owners of a county, the Board of County Commissioners may enter into an agreement with the State Livestock Sanitary Board for the testing of the cattle in the county, and also requires them to appropriate a sum of money not to exceed twenty-five cents per head for each tuberculin test necessary until the county is officially designated as a Modified Accredited Tuberculosis-Free Area. The law does not require the county to make any appropriation for indemnity purposes. The tuberculin test is made by the State Livestock Sanitary Board in the counties according to the priority of the date of registry of the agreement of the Board of County Commissioners with the State Board. Immediately after the passage of this law, a large number of counties took advantage of it and registered agreements with the Sanitary Board. The tuberculin testing under the Area Plan has been intensive since the fall of 1923.

On January 1, 1932, sixty-five of the eighty-seven counties in Minnesota had registered agree-

ments for the control of tuberculosis with the Livestock Sanitary Board under the Area Plan. Petitions of the majority of the cattle owners in nine of the remaining twenty-two counties had been filed with the Boards of County Commissioners, and the Boards refused to recognize such petitions and take advantage of the law. The legislature in 1932 amended the law by providing that the Boards of County Commissioners may enter into an agreement with the Sanitary Board for the tuberculin test of the cattle in their counties without a petition of the cattle owners. Also that when the majority of cattle owners sign a petition for the testing of the cattle and file it with the Board of County Commissioners, such Board shall enter into an agreement with the Sanitary Board and make the necessary appropriations. Further, that in counties where a petition of the majority of the cattle owners had formerly been filed with the Board of County Commissioners, and in which the Board of County Commissioners had not entered into the agreement with the Sanitary Board and made the necessary appropriations, that if a second petition of one hundred cattle owners is filed with the Board of County Commissioners, they shall then make the necessary appropriations.

The highest percentage of infection disclosed in any county in Minnesota to date is 5.79, and the lowest percentage is in Cook county in which the cattle population is only 565. No tuberculous cattle were disclosed in this county. The counties of Aitkin, Beltrami, Clearwater, Cook, Crow Wing, Itasca, Koochiching, Lake, Lake of the Woods, Otter Tail, and St. Louis had less than five-tenths of one per cent infection on the first complete test. The counties of Benton, Carlton, Isanti, Kanabec, Kittson, Marshall, Morrison, Norman and Roseau had less than one per cent infection. All the other counties that are now accredited, with the exception of two, had one per cent or more infection. We were therefore compelled to make a second complete test and also two retests of infected herds. By so doing we were able to reduce the percentage, and the second complete test disclosed less than one per cent infection. In some instances, the second complete test disclosed less than five-tenths of one per cent infection, and the county was officially accredited. In the counties of Freeborn and Dakota, the second complete test disclosed more than one per cent infection, thus requiring a third complete test before the counties were accredited. In counties in which the infection was less than one per cent and more than five-tenths of one per cent, it was necessary for us to make one retest

of the infected herds before the county was officially accredited.

On March 1, 1932, fifty-nine counties, or 67.8 per cent of the counties in Minnesota were officially designated as Modified Accredited Tuberculosis-Free Areas for a period of three years. All the cattle in Stearns and Kandiyohi counties have been subjected to one complete tuberculin test. We have also made two retests of the infected herds in Stearns county, and will make the second annual complete test of all the cattle in the county during the month of March. We have made one complete test of all the cattle in Kandiyohi county and also one retest of the infected herds; we will make a retest of the remaining infected herds in May and will make a second complete test of all the cattle in September.

The uniform rules throughout the United States provide that the official period of a county's being accredited is three years, and prescribe detailed rules for the testing of the cattle in such counties in order that they can be continued as officially accredited areas. We have retested all of the cattle in twenty-three counties in Minnesota after the first period of accreditation expired. The average percentage of infection disclosed in such retests in these counties was 0.423. Some of these counties, at the time they were officially accredited, and for one to three years thereafter, were surrounded by counties in which the cattle had not been tested, and the majority of the reacting cattle were found in herds to which cattle originating from outside sources had been added.

The following is a list of the counties in which all cattle were retested.

Meeker, Traverse, Murray, Red Lake, Freeborn, Scott, Faribault, Wilkin, McLeod, Big Stone, Mower, Dodge, Lincoln, Olmsted, Fillmore, Winona, Goodhue, Le Sueur, Dakota, Brown, Watonwan, Carver and Rice,

These results disclose that the Area Plan of elimination of tuberculosis is practical and permanent, and the public expense is justified. It is a complete answer to all the misstatements that have been circulated throughout the country by propagandists. We have now succeeded in building up larger accredited areas, and as soon as we are permitted to make the necessary tuberculin tests in the remaining counties of the state, the danger of the infection will be practically nil. Certainly this will reduce the incidence of tuberculosis in the human family in Minnesota. As above stated, all of the state of Wisconsin is accredited, and Iowa and North Dakota will be accredited in a short period. South Dakota is the only adjoining state against which we will be

compelled to enforce rigid quarantine requirements on the importation of cattle to protect the cattle of Minnesota.

We have tested the cattle in four counties in Minnesota after the second period expired in order that they could be continued as accredited areas.

The following is a list of the fifty-nine counties that have been officially designated as Modified Accredited Tuberculosis-Free Areas:

Red Lake, Traverse, Meeker, Murray, Faribault, Wilkin, Freeborn, Scott, McLeod, Big Stone, Dodge, Mower, Lincoln, Olmsted, Fillmore, Winona, Dakota, Goodhue, Watonwan, Le Sueur, Brown, Carlton, Carver, Rice, Red Wood, Blue Earth, Washington, Ramsey, Hennepin, Polk, Anoka, Kittson, Lake, Cook, Itasca, Nicollet, Wabasha, Kanabec, Norman, St. Louis, Steele, Isanti, Sherburne, Marshall, Roseau, Wright, Waseca, Lake of the Woods, Beltrami, Koochiching, Clearwater, Chisago, Morrison, Benton, Cottonwood, Mille Lacs, Crow Wing, Aitkin and Otter Tail,

The Minnesota Livestock Sanitary Board was organized in April, 1903. The records disclose that from 1903 to June 30, 1931, tuberculin tests have been applied to 9,432,383 cattle, of which 208,619, or 2.28 per cent, reacted to the test. From July 1, 1923, until June 30, 1931, which represents the period since the Area Plan of control of tuberculosis was initiated in Minnesota, there have been 8,254,126 cattle subjected to the tuberculin test, of which 166,788, or 2.02 per cent, reacted. An average of 25,000 cattle were tested annually by the State Livestock Sanitary Board in the fiscal years of 1903 to 1910, and the average infection disclosed was approximately 6.5 per cent.

The Boards of County Commissioners of Douglas, Becker and Jackson counties have entered into an agreement with the State Livestock Sanitary Board as provided by the law, agreeing to make the necessary appropriations. However, they failed to carry out their agreement and refused to make the appropriations under the contract.

The Board of County Commissioners of Renville county, in compliance with the law, executed the agreement with the Sanitary Board for the Area Plan of control, and arrangements were made for the initial testing of the cattle in November, 1931. Legal proceedings were initiated to enjoin the Livestock Sanitary Board from making the tuberculin test of the cattle. This has prevented the testing of the cattle until we have the court decision.

Since the legislature amended the law, the

second petition with the necessary number of cattle owners has been filed with the Board of County Commissioners of Pine County. The Board refused to comply with the law and enter into the agreement and provide the necessary funds. This resulted in the Sanitary Board's taking legal mandamus proceedings to require that the Board of County Commissioners comply with the law. The case was argued in district court, and the decision was rendered in favor of the state. An appeal to the supreme court has been made, and if the decision of the district court is sustained, without doubt the control of tuberculosis under the Area Plan will then be initiated in Pine county and also in seven other counties of the state in which the majority of the cattle owners had formerly presented a petition to the Boards of County Commissioners for the adoption of the plan.

The progressive thinking farmers and cattle owners throughout Minnesota are in favor of the elimination of tuberculosis in cattle. They have come to this conclusion, as a result of the large amount of official tests that have been made throughout the state since the year 1903, and the co-operative tuberculin testing of cattle throughout the state under the individual state and Federal accredited tuberculosis-free herd plan that was in effect for six years prior to the time the Area Plan was adopted. In practically every community some of the farmers witnessed the autopsies of the cattle that had reacted to the tuberculin test and were convinced they were diseased.

The results of these tests disclosed that tuberculosis could be eliminated from the individual herds. When the Area Plan was initiated, immediately a large number of the counties of the state took advantage of the same and applied to the Sanitary Board for the test. It was necessary to initiate the testing in each county in the order of the registration of the agreement. The testing has progressed as rapidly as possible with the appropriations and expert personnel available. As the result of the efforts of propagandists, whose apparent interest in these matters was monetary gain, in furnishing false statements to organizations and individuals who were apparently interested only with the idea of political preferment, a minority of the farmers located in the remaining twenty-two counties that have not taken advantage of the law providing for the Area Plan of control of the disease, have been impressed and apparently believe the false statements furnished to them through the publications issued by the American Medical Liberty League, quotations from these publications printed in the country

newspapers, and also false statements made over the radio in some localities daily for a number of months. It is only natural that owners of cattle are impressed by such constant statements; we should not condemn them, but should extend our sympathy to them. Under the present depressed conditions the farmers are in a proper frame of mind to become discouraged in their efforts to succeed in their calling, and they naturally constitute a fertile field for the dispensers of this false information. Propagandists have made statements over the air and through the press that the tuberculin test will cause healthy cattle to react and will leave the badly infected and the scrub cows; that it is a frame-up between the veterinarians and the packers to get the good cattle for little or nothing; that all but a very few of the reactors are passed for food. This proves, to their minds, the cattle did not have tuberculosis. They also claim tuberculin will produce abortion in cattle, that it sickens and ruins herds of cattle and causes the production of stringy milk, et cetera.

They have failed to inform the cattle owners and farmers that tuberculin testing has increased very rapidly since the early nineties; that the test has disclosed that all the cattle in some of our finest purebred herds, particularly in the eastern states, were affected with the disease and were destroyed; that the tuberculin testing of some of the dairy herds in the vicinity of our larger cities has disclosed that 50 per cent or more of the cattle were affected with the disease, and that the carcasses of 16 to 18 per cent of the cattle that react to the tuberculin test are found to be so generally infected with the disease that they are thrown into the tank and not permitted to be used for human food.

The active and continued support of the public, livestock breeders, associations, farmers and various livestock market interests in ridding the nation of a major disease in livestock is due to sound economics and the conservation of public health. It is a well-established fact that cattle and dairy products from herds free of tuberculosis command better market prices. The daily increasing public demand for dairy products from clean cattle has brought about a critical economic situation to the owners of untested cattle, as they are not only compelled to accept lower prices, but in many instances are barred from previous markets. The conservation of public health in the protection of children by furnishing milk from cattle free from tuberculosis has made the strongest

appeal, as in many communities tuberculosis in children has been observed on farms where the cattle have reacted to the test.

During the past six months a very worthy effort has been made to decrease the tax burden throughout the country. The propagandists and parties condemning the control of bovine tuberculosis have taken advantage of this effort in their endeavors to influence the Boards of County Commissioners and the farmers of the state to prevent the extension of the work.

The results of the practical application of the testing under the Area Plan during the past year in Minnesota shows that the owners of the react-

ing cattle have received sufficient return in the payment for the salvage of the carcasses and the indemnity from the state and Federal governments to replace the diseased animals with cattle that are free from the disease. The present market price of dairy, as well as beef cattle, is lower than it has been for a great many years. The present price of butter-fat, although it is a little higher than it was some months ago, is lower than at any time since 1904. It will thus be understood that from an economic standpoint, the present time is the proper one for the farmers and cattle owners to eliminate the disease and to build up herds containing healthy, productive cattle.

## Results of the Mantoux Test and X-Ray Examination of a Group of School Children\*

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THE study of tuberculous infection in childhood has received a great deal of attention during the past few years and has resulted in a newer and better understanding of that important subject. It is a well recognized fact that the death rate from tuberculosis has steadily decreased until it is less than half what it was twenty years ago. A study of statistics, however, shows that there has been very little reduction between the ages of fifteen and twenty-five years, and that it is still the leading cause of death during that period. These facts would naturally tend to focus attention on the period of adolescence. Further investigation reveals the fact that it is really the period of childhood that is the most important.

Although this period has the lowest mortality rate of any period of life, it is often at this time that the tuberculous infection first enters the body. In many cases it either remains latent until the strain of adolescence causes it to become active again, or it prepares the way for the rapid progress of the adult, or fatal, type of disease if reinfection occurs.

The childhood type of tuberculosis is the name adopted by the National Tuberculosis Association to describe the diffuse or circumscribed lesions in the lungs and associated tracheo-bronchial lymph nodes that result from the first infection of the pulmonary tissue with the tubercle bacillus<sup>1</sup>.

The chief differences between it and the adult type are: (1) The childhood type usually occurs in children and represents the reaction to the original infection, while the adult type may occur in children but is usually found in adults and is the result of reinfection on sensitized tissue, (2) the associated lymph nodes are always involved in the childhood type and rarely in the adult type, (3) in the childhood type the primary lesion may be found in any part of the lung, while in the adult type it is usually in the upper third, (4) in the childhood type there is a tendency to caseation and later calcification in both the lung parenchyma and lymph nodes; in the adult type caseation is followed by cavity formation and fibrosis.

A definite connection has been shown to exist between the adult type of tuberculosis that develops during adolescence and the childhood type. Myers<sup>2</sup> has been able to show by means of roentgenograms in at least 50 per cent of cases of the adult type, definite signs that the childhood type had previously existed. If the large number of cases could be added in which the childhood type cannot be demonstrated by this means, the percentage would be considerably higher. It has been estimated that one out of eight cases of childhood type of tuberculosis develops the adult type during adolescence.

The greatest problem of the present time, therefore, resolves itself into detecting the childhood type of tuberculosis in children and young adults and preventing them, as far as possible,

\*Presented before the Lymanhurst Medical Staff, February 23, 1932.

from developing the adult type later in life. In the detection of this type of tuberculosis the program, as outlined by the National Tuberculosis Association and the Minnesota Public Health Association, is: (1) application of the tuberculin test to all school children and as far as possible to all pre-school children, (2) X-raying of all positive reactors to show the extent and severity of the lesions, (3) investigation of the families from which they come to discover the source of infection and prevent further exposure to infection. Physical examination is of little importance in most cases, for unless there is a definite infiltration or consolidation in the lung parenchyma, there are usually no characteristic signs.

The two types of tuberculin tests that have been commonly used are the Pirquet or epidermal, and the Mantoux or intradermal; the principle of each is to bring tuberculin into contact with the deeper layers of the skin. Because of its greater accuracy the Mantoux has the most widespread use, and the Pirquet has been discarded by most workers. In the same group of over three thousand children, Smith<sup>3</sup> found 7.8 per cent reacting to the Pirquet and 16.5 per cent reacting to the Mantoux.

A positive reaction is a sign of allergy and means that the tissues have become sensitized to tuberculin by the presence of living tubercle bacilli in the body at some time in the life of the individual. A positive reaction always means tuberculous infection but not necessarily disease. Myers<sup>4</sup> is of the opinion, however, that the more vigorous the reaction, the more likely is the child to have clinical tuberculosis. A negative result generally rules out infection if care is taken to exclude error in applying the test, although there are cases in which it is not reliable. For a short period, varying from a few days to several weeks immediately following infection, which is known as the preallergic stage, during and immediately following acute infectious diseases such as influenza and pneumonia, and in far advanced cases of tuberculosis, the reaction may be negative or only slightly positive.

It was only a few years ago that it was believed that all adults and practically all children at the age of puberty would show positive reaction. These conclusions were based chiefly on European studies and have been disproved by work recently done in this country. There is, however, a wide variation in the percentage of reactors reported in different parts of the country and even in neighboring communities.

Slater<sup>5</sup> found an average of 10 per cent of

school children in a rural Minnesota community infected; Harrington and Myers<sup>6</sup> found 48 per cent of boys and 46 per cent of girls in a group of Minneapolis school children reacting positively; Leggett<sup>7</sup> studied about six hundred children in St. Paul, of whom 23 per cent reacted to tuberculin, and Frost<sup>8</sup> reported 22 per cent of school children in a Minnesota Town with positive reactions. In Massachusetts where over one hundred thousand school children have been tested in a ten-year program, the incidence of infection was 28 per cent<sup>9</sup>. In one city of sixty thousand the percentage varied from 11 per cent in one section of the city to 60 per cent in another section.

During the month of November, 1931, a survey was conducted under the direction of the Minnesota Public Health Association in the public and parochial schools of Comfrey, a community with a population of about six hundred in Southwestern Minnesota. Total enrollment of the two schools was 348. Consent for the test was given by the parents of 258, or approximately 75 per cent of the students. It was unfortunate that in the same week the consent cards were sent out, an article was published in a weekly magazine with a large local circulation dealing with the Lubeck disaster. This caused many of the parents to withhold their consent, and in some cases to withdraw it.

The tuberculin used was obtained from the Public Health Association and diluted 1/1000; 0.1 cc. of this solution or 0.1 mgm. of old tuberculin was injected intracutaneously. The test was read in forty-eight hours and rated according to the classification of Opie and McPhedran: 1 plus for an area of redness and edema of 10 mm. or less, 2 plus for a reaction of 10 to 15 mm., 3 plus for the areas over 15 mm. and 4 plus when necrosis was present. The age of those tested ranged from 5 to 20 years, 139 were boys and 119 were girls. No attempt has been made to give the results for each age because of the wide variation which would be expected in such a small group; instead five-year periods have been used. The results are given in Table I:

Age	Total Tested	—Negative—		—Positive—		Per Cent Positive		
		Male	Female	Male	Female			
5-10	112	59	45	104	5	3	8	7.14
11-15	110	56	41	97	7	6	13	11.8
16-20	36	10	23	33	2	1	3	8.3
	258	125	109	234	14	10	24	9.3

The highest percentage was at fourteen years, 26 per cent reacting. The highest in five-year groups was from eleven to fifteen years, 11.8 per

cent. Rated according to the severity of the reaction, sixteen were 1-plus, five 2-plus and three were 3-plus; there were no 4-plus reactions.

Of the twenty-four positive reactors, definite history of exposure was found in ten, questionable history in two, and no history of exposure in twelve cases. The general belief is that children who have had contact with tuberculous persons react more strongly than children who have no history of contact with the disease. Dickey<sup>10</sup> found this to be true in a study of seven hundred positive reactors. The relation between history of exposure and the extent of the reaction in this group is given in Table II.

Mantoux	Total	Doubtful Exposure	No Exposure	Percentage
I	16	3	11	31.25
II	5	4	1	80.00
III	3	3	0	100.00
	24	10	12	50.00

Single X-rays were taken of the chest of all positive reactors, and the plates were interpreted by Dr. Rigler of the University of Minnesota. The results according to the classification of the lesions present are given in Table III.

Age	Mantoux Positive	X-Ray Neg.	Primary Focus	Ghon's and Nodes	Nodes Only
5-10	8	6	0	2	0
11-15	13	10	1	1	1
16-20	3	1	1	1	0
	24	17	2	4	1

The relations between severity of the tuberculin reaction and X-ray findings are given in Table IV.

Mantoux	X-Ray Neg.	Primary Focus	Ghon's and Nodes	Nodes Only	Total	Per Cent Pos. X-Ray
I	13	1	2	0	16	18.75
II	3	0	1	1	5	40.00
III	1	1	1	0	3	66.66
	17	2	4	1	24	29.10

In all 29.1 per cent of those X-rayed showed evidence of childhood tuberculosis. There were no cases of adult type of tuberculosis. In six of the seven cases showing X-ray evidence there was definite history of exposure. In the other case there were two others in the family with positive reactions, but the parents would not cooperate in tracing the history of exposure.

Twelve pre-school-age children, ranging in age from two to five years, have also been tested.

One reactor was found. No X-ray was taken of this case as the family moved away shortly after the test was given. In this case the grandfather died from tuberculosis several years ago, one aunt and one uncle are in the State Sanatorium, and the mother and every member of the household reacted positively to the test. X-rays were taken of six older children and adults in this family; two were negative and four showed evidence of childhood tuberculosis.

Eighty-six adults were also tested, including eleven school teachers; fifty-six were negative and thirty or 34.8 per cent were positive. X-rays taken of fifteen of the positives showed no active tuberculosis, nine were negative, and six showed calcified areas in the lung parenchyma or tracheo-bronchial nodes.

#### SUMMARY

Two hundred and fifty-eight school children, ranging in age from five to twenty years, were given the intracutaneous tuberculin test and twenty-four or 9.3 per cent, reacted positively. Single X-rays were taken of the positive reactors, seven, or 29.1 per cent of those reacting, or 2.71 per cent of those tested, showed X-ray evidence of childhood tuberculosis. One case was definitely active; the other six were most likely latent. The incidence of 9.3 per cent, found in this small series, coincides with the findings of Slater in the same section of the state, if no consideration is taken of the fact that in one instance the Pirquet test was used and in the other the Mantoux.

To reduce the death rate from tuberculosis further it will be necessary to give more and more attention to the early diagnosis of infection in childhood and early adult life. The tuberculin test and X-ray examination are the best means available for this purpose at the present time.

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## Tuberculosis and the General Practitioner

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**R**ECENTLY a seventeen-year-old boy presented himself for examination, complaining of pain in the left chest, loss of weight, and insomnia. Questioning revealed that six months before this he had begun to tire easily, and that he had lost three pounds in weight. This he regained later in the fall. Intermittently during those six months he had an unproductive cough which was worse at night than during the day. After the first part of last December he was bothered constantly with pain in the left chest; his appetite decreased; he lost weight; he was unable to sleep. Physical examination demonstrated only: Temperature, 99.4° F., pulse rate 90, enlarged tonsils, flattening and lagging mobility of the left hemithorax, and scattered, transitory, crepitant and moderately coarse rales, heard only posteriorly from the hilum to the left apex. Several days after this first examination no other symptoms or signs could be elicited.

Since both the history and physical signs indicated a search for more exact information concerning the lungs, a von Pirquet test was applied. In forty-eight hours a three-plus positive reaction was found. Thereupon, a roentgenogram was taken and submitted to a recognized roentgenologist whose interpretation was as follows:

"This plate shows a fairly marked glandular enlargement in the left hilum, with evidences of a minimal parenchymal infiltration extending laterally from the upper portion of the hilum into the periphery of the third interspace. It is probable that this also represents a childhood tuberculosis with glandular involvement, but the minimal parenchymal lesion may be an early adult type of infiltration, and probably should be treated as such until the contrary can be proved by continued observation." The circumstances of the patient's family required an immediate application for his admittance to the Minnesota State Sanatorium, which was granted.

This case is cited merely as an example of some of the diagnostic difficulties which confront the rural practitioner—as well as the urban physician. While the same problems are common to both men, they must seek their solutions in vastly different conditions. After graduating from the medical school, inexperienced in handling cases

like this without supervision, reverent toward the mysticism that enshrouds all but the more obvious physical signs, unequipped with any except the most fundamental laboratory tests, and unable to induce his patients to accept hospitalization except when death seems to impend, the rural doctor must find the answer to such challenges as this case presents in prolonged clinical observation.

On the other hand, his confrere in the city deals with a group of patients educated to hospital observation, can dispose of his pauper patients in charity hospitals, often continues to hospitalize his wealthier ones in the same institution in which he served his internship, where still a kindly word of guidance is offered by fellow staff members, and has available an elaborate diagnostic and therapeutic armamentarium as well as expert consultation. In spite of these differences, the institution of proper treatment is as dependent upon early accurate diagnosis in the rural as in the urban case.

In one rural practice, cases like that described were encountered so often that it became necessary to outline a diagnostic routine which unfailingly would detect every case of tuberculosis, regardless of its stage or mode of onset. Since such a diagnostic program is the feature of the campaign against tuberculosis in rural districts on which success in the eradication of the disease most depends, a description of it may prove helpful. A detailed history is taken and a careful physical examination performed. When these two procedures arouse suspicion the patient is asked to keep a daily temperature record with readings recorded every four hours, and is taught how to do it. Repeated sputum examinations are made. The von Pirquet tuberculin test is used as a routine, but when it leaves any doubt, the Mantoux test is applied.

All atypical cases of pneumonia are subjected to tuberculin tests. Whenever any test shows a positive reaction, X-ray plates of the chest are taken and submitted to some roentgenologist for interpretation. Basal metabolism tests are made and repeated as necessary. Each diagnosis is confirmed by consultation. The reason for this and for the submission of roentgenograms to some well-known specialist for interpretation is that the

practitioner who undertakes a diagnostic campaign of this sort runs a risk of arousing the prejudices of the ignorant in his community. He can accomplish the best results by avoiding friction; he is most likely to do this by enlisting professional co-operation.

When the value of the tuberculin tests and the need of such a diagnostic routine are impressed indelibly on the minds of every general and rural practitioner, the first great milestone on the way to conquest of the disease in rural regions will have been passed.

Use of these diagnostic measures will equalize the present disparity between the rural and the urban practitioner, and will make it as easy for the one as for the other to detect the early, obscure case of tuberculosis. However, the pathways of the two men diverge again. After establishing the diagnosis of tuberculosis, the urban physician reports the case to the proper authorities, who in turn see that it is studied epidemiologically. In rural districts the family physician must find the source, must determine the extent of dissemination that has taken place prior to his diagnosis, and must ferret out all the ramifications of the epidemiology of the case. Often this work can be accomplished only through gradual education of the lay mind. Yet each objective won intensifies the physician's own interest in the work, vividly correlates laboratory and clinical findings, opens wider vistas than were before visualized, and brings the final conquest much nearer to achievement.

In trying to solve the problems involved in control of the disease in rural districts, the tuberculin tests are the physician's sheet anchor. By testing each relative and close associate of every patient, the source of each case as well as the dissemination of the disease that results from it can be determined. The taking of X-ray plates of each person tested who reacts positively, and the interpretation of these plates by someone especially qualified in roentgenography will point definitely to other cases. This, then, is the first step toward proper rural epidemiological control.

It has been proved that human tuberculosis is more frequent in regions where the incidence of bovine tuberculosis is high than elsewhere. So, despite the predilection of this strain of the bacillus for bones, joints and glands, the possible etiologic relationship to pulmonary tuberculosis should not be overlooked. This means that possibilities of contamination of milk and dairy products must be investigated. Where the family milk supply is provided by a village milk route, all

cows from which milk is obtained for village consumption should be tested. To insure tuberculin testing of such herds at proper intervals, an ordinance requiring such testing is necessary. Usually it is not difficult to get one passed after a single case of tuberculosis has been found in the village. If, as often happens in the country, the milk supply is obtained from animals owned by the patient's family, it is just as urgent to have all cows in the family herd tested.

Another potential source of dissemination in many smaller communities is the creamery. Almost invariably all milk and cream used are pasteurized; yet the local problem is not adequately studied until it is ascertained that this has been done. All cows suspected of the disease should be tested before their products are accepted by the creamery. But the area test of the State Live-stock Sanitary Board is even more vitally assuring. It means that all the dairy cows in the county are tested and retested under appropriate veterinary supervision. This has led ultimately, in many counties and states, not only to the virtual eradication of the disease in cattle, but also to an almost total absence of human tuberculous infection and disease. Still one more approach should be made. In case—either through the testing of cattle suspects supplying dairy products to the creamery, or through an area test—any cattle are found infected, each member of the family owning these animals should be tested, and, if necessary, studied roentgenographically.

Such a campaign leads inevitably to public consciousness of the constantly imminent danger of tuberculosis, and often, with such a public attitude, tuberculin testing of various groups of school children becomes possible. Thus far, the more extensive tuberculin testing programs have been conducted by sanatoria and public health agencies. But when the general practitioner is stirred to greater interest in these campaigns, they, like the movement for diphtheria immunization, will fall to his lot.

For the adequate control of tuberculosis more widespread appreciation of the following facts is essential:

1. A definite diagnostic routine available to every general practitioner and unfailing in its detection of every case of tuberculosis, regardless of its stage or mode of onset, must be brought to the consciousness of all general practitioners, and they must be persuaded to adopt it.

2. More sympathetic realization of the difficulties under which the general practitioner is compelled to work will aid those primarily interested

in tuberculosis to arouse his active co-operation in the broader aspects of the campaign.

3. Armed with a positive means of diagnosis and vitally interested in the control of the disease, the general practitioner will exert greater effort

in the study of the patients' associates as well as in other phases of epidemiological control.

When these measures have been brought into full play the mortality rate of the disease will show further appreciable reduction.

## Treatment of Tuberculous Pregnant Women

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NOT infrequently, tuberculosis is found in a pregnant woman, or a tuberculous woman becomes pregnant. That this occurs is not surprising, because the age period during which tuberculosis is most frequently found coincides with the period in which pregnancy is most likely to occur. As pulmonary tuberculosis comprises over 90 per cent of the tuberculosis in our part of the country, a tuberculous woman as here considered is one who shows definite evidence of adult type of pulmonary tuberculosis, in either an active, quiescent or healed state.

Among physicians, there is a steadily increasing realization of the importance of complete physical examination early in pregnancy. That their advice to patients is bearing fruit is evidenced by the fact that most of the women delivered at Glen Lake Sanatorium discovered their tuberculosis at such examination. This complete examination cannot be commended too highly, and should by all means include an X-ray of the chest. The necessity of X-ray films has been brought out very convincingly by Brown<sup>1</sup> who shows in a study of 1367 cases of pulmonary tuberculosis that the Roentgen ray was positive in 99 per cent, while the next most dependable sign (rales) was found in only 68.5 per cent.

When the examination of the pregnant woman discloses signs of tuberculosis, it is necessary to determine whether these signs are of clinical significance, i.e., whether they indicate activity of the disease or simply a latent focus. This necessitates a careful and accurate history, especially concerning recent symptoms of tuberculous origin, such as fatigue, loss of weight, cough or expectoration, fever, high pulse, etc. Blood counts may be of some help in determining the clinical significance of the disease, but otherwise very little help can be expected from the laboratory.

We often meet with two erroneous ideas con-

cerning the demonstration of activity—one has to do with X-ray and the other with rales. A series of X-ray films will give evidence of activity, but a single film cannot be depended upon for this information, although it may give suggestive evidence because of the softness or fluffiness of lesion in contrast to the clear-cut shadow of a thoroughly healed lesion. Presence of rales is no indication of activity. Every man who sees much tuberculosis has followed for years patients showing rales who are able to work for long periods without symptoms.

History, then, is by all odds the best means of demonstrating activity. The greater the activity, the greater the handicap under which a tuberculous woman bears children. A healed lesion offers only a slight handicap.

### GENERAL CONSIDERATION OF PREGNANCY AND TUBERCULOSIS

At one time, it was felt by many that pregnancy was beneficial to tuberculosis. This view was based on the fact that during pregnancy metabolism was heightened, and that women for the most part looked and felt better. This contention is well brought out by Edw. Warren<sup>2</sup> in an essay awarded the Fiske prize in 1856. That pregnancy was not a panacea for tuberculosis was realized in 1861 at least, when Lawson<sup>3</sup> quoted Griscolle and Dubreinth as holding the view that pregnancy caused aggravation of the tuberculosis. Gradually others followed. Forssner<sup>4</sup> in reviewing the German, French and Scandinavian literature both before and since the war, found it almost entirely of the opinion that pregnancy aggravated the tuberculous process.

If pregnancy aggravated the tuberculous process, the termination of pregnancy was but a natural development. This procedure was founded on the premise that tuberculous women should be saved the stress and strains of labor, and on

The observation that many women died of tuberculosis during pregnancy or shortly after delivery. The interruption of pregnancy has been the method followed for years in treating the combination of pregnancy and tuberculosis. The logic of it has always been questioned—by some on the grounds that it was as hard on the mother as normal labor, by others because of the sacrifice of the child—and it has never been conclusively shown that it was the best means of treatment.

Scattered through the more recent literature, articles may be found which tend to show that pregnancy does not have the detrimental effect on tuberculosis that was formerly believed. Among them is one by Forssner<sup>4</sup> who shows interesting tables in which he compares, after two years of observation, never pregnant women and women who had given birth to children. In the first, or incipient, stage of the disease his findings show practically no difference in the two groupings, while in the second and third stage, the mothers showed a little greater tendency to the aggravation of their disease.

Alice Hill<sup>5</sup> made a similar study in Detroit more recently and found practically no difference between women who had given birth to children and those who had never been pregnant. We (Jennings and Mariette)<sup>6</sup> have studied the histories of women who have entered Glen Lake Sanatorium and who have had their tuberculosis discovered either before, during, or within one year after delivery, and compared the discharge classification of this group with that of a group of never-pregnant women and found no difference between the two groups. We (Jennings, Mariette & Litzenberg)<sup>7</sup> have shown in another study that tuberculosis in the pregnant woman, when properly treated does not have the detrimental effect reported by so many writers, and we attribute our results to the fact that our cases were given sanatorium treatment for their tuberculosis before and after labor in contrast to the dispensary type of treatment of most observers.

The methods which we suggest below for caring for tuberculous pregnant women may have to be modified in the future, but they are the ones which we have followed for about eight years and the ones which we shall continue to follow until we find them unsatisfactory.

#### ACTIVE CASES OF PULMONARY TUBERCULOSIS

Because of the necessity of close supervision and frequent X-ray films, a pregnant tuberculous woman can be cared for in a sanatorium much better than in a home. In fact, her sana-

torium residence and careful observation should continue for some time following delivery, because many men are of the opinion that activation of the tuberculosis is more apt to occur after delivery than during pregnancy.

Whether the patient is at home or in the sanatorium, the most important point of her treatment is bed rest with no bathroom privileges allowed. If the patient has not more than one degree of fever, she may sit up in bed for meals only, but should spend the rest of her time lying down. In cases where there are two or more degrees of fever, the patient should not even be allowed to feed herself.

In addition to bed rest, pneumothorax and shot bags may be used in suitable cases. We have done no thoracoplastic or phrenic operations on pregnant women, preferring to postpone such treatment until after delivery. We postpone the thoracoplasty because of its severity and the attendant shock, and postpone the phrenic nerve operations because of the support that the diaphragm may give during parturition. In cases where a phrenic operation is indicated, the shot bags form a fairly satisfactory substitute until after delivery. Neither of these operations in themselves need be taken as contra-indications for future pregnancies if the woman is particularly anxious to bear children. Three of our discharged patients who have had thoracoplasty, and one who has had a phrenic excision, have since given birth to children, with apparently normal labor.

I do not feel that exercise immediately preceding labor is necessary or advisable for the patient with active tuberculosis. We allowed exercise in only two of the twenty-seven women who went to full-term at Glen Lake Sanatorium and now question the wisdom of having allowed it in one of these.

Labor should be made as short and easy as possible, but I am not convinced that Caesarean Section is necessary for the average multiparous case.

After delivery, we remove the child to the Children's Building where there are no open cases of tuberculosis, and the child is kept entirely apart from the mother while in the Sanatorium. No attempt is made to express the mother's milk for the child's feeding.

In an X-ray study of twenty-seven full-term mothers delivered at Glen Lake Sanatorium, we<sup>7</sup> found before delivery that ten showed improvement, thirteen showed no change, and only four showed any extension of the disease; three of these showed extension in one lung and improve-

ment in the other. These findings do not support the contention that pregnancy aggravates pulmonary tuberculosis.

Following labor, the active case should be watched with the greatest care for many months so that any possible activation may be detected as early as possible. After studying case histories of a large series, Barnes and Barnes<sup>8</sup> express themselves thus: "It is not the baby in the uterus, but the baby in the home which seriously endangers the life of a woman with active tuberculosis."

#### QUIESCENT CASES OF PULMONARY TUBERCULOSIS

The National Tuberculosis Association's classification of a quiescent case specifies that the lesion be stationary or retrogressive for two months and that the patient be on at least one hour daily exercise for one month. Since so short a period as two months may lapse between the active and the quiescent stages, I feel that the quiescent case should be treated as though she were an active case.

#### APPARENTLY CURED CASES OF PULMONARY TUBERCULOSIS

This term is considered suitable for cases which, in brief, have been living under ordinary conditions of life for a period of two years and have shown no change in their condition. Cases which conform to this classification may not and probably will not require the bed rest that an active case does. They should, however, have their activities curtailed and spend considerable time resting. With severe nausea and vomiting or other symptoms, bed rest should be instituted, as with the active cases.

These people should have labor made as easy for them as possible, and following labor the child should be separated from the mother, and the mother should have bed rest for four to six months, longer if there are symptoms or signs to indicate it.

*Infection in Utero*—We have not found that tuberculosis was transmitted from mother to child in utero, and it is our opinion that when infection occurs in the child it is the result of infection after birth. We have not found that children born of tuberculous mothers were below par in any way.

#### SUMMARY

It is our opinion that a tuberculous pregnant woman should not be aborted unless complications arise which would warrant this operation if she were non-tuberculous. We recognize the possibility of pulmonary tuberculosis becoming activated during pregnancy and after labor, but feel that the likelihood of this occurring is much reduced by proper consideration of the tuberculosis. We feel that tuberculous women should be instructed in contraceptive methods. In our experience intra-uterine of tuberculosis has not occurred.

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## The Role of Surgery in Tuberculosis Control\*

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WITH the advent of bacteriology as a science came classification of the nature of many infectious fevers. Occasional successful differentiations of confused entities had been possible by the employment of carefully recorded accurate observations. On this basis, Pierre Louis, the master of the method, had differentiated typhus and typhoid fevers in 1829. The duality of these fevers was established by Louis' American pupil, Gerhard, of Philadelphia, in the typhus epidemic of 1836 in the uniform

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absence of intestinal lesions so characteristic of typhoid fever. Without an appreciation of the nature of the cause of these and other communicable diseases, it is little wonder that differentiation was difficult and not surprising that chaotic confusion enveloped the field.

Knowledge of bacteria as the responsible agents in the genesis of infectious fevers brought light and understanding into this state of disorder. The employment of this new approach, viz.; the determination of the etiologic organism separated definitely and securely disorders that

half a century of laborious recording of meticulously scrutinized observations had failed to establish. Robert Koch, who has since been rightfully called the founder of the science of bacteriology came upon the scene when visualization of bacteria with the microscope was a novel observation. His discovery in 1882 of an acid fast bacillus as the causative agent of tuberculosis, laid the foundation for an intelligent attack upon the disease. This revelation disposed of other theories of the origin of tuberculosis and dealt a death blow to the generally accepted hereditary feature. Without this information of the nature of tuberculosis, our therapy would be as empirical as the present treatment of malignancies.

Knowledge of the modes of contagion in tuberculosis has resulted in intelligent measures to limit its communication. Segregation of known infectious cases and the slaughtering of tuberculous cattle and the pasteurization of marketed milk have materially reduced the sources for contraction of the disease. These (inhalation and ingestion) are the almost sole sources of origin of tuberculous infection and were it possible and practical to detect and isolate every human source of menace and to eliminate completely all bovine infections, the problem of tuberculosis would soon be solved.

Unfortunately, however, many barriers lie between knowledge and achievement! We know how automobile accidents may be prevented, but at the same time are impotent in stopping their occurrence. Rigid enforcement of motor laws contributes to lesser negligence and consequently fewer accidents. Similarly, strict adherence to the public health policies, which hold the key to the contagion factor in tuberculosis, will contribute more than all other known means to a definite lessening of morbidity and mortality in tuberculosis.

Unhappily, vaccination has proved disappointing as a prophylaxis against tuberculosis. Koch, to whom we owe an immeasurable debt of gratitude, hoped and believed that tuberculosis could be prevented by vaccination. The elimination of the tubercle bacillus and the enhancement of immunity or heightening of resistance though intimately related problems with the same end in view vary considerably in the practicability of attainment, granted that both were possible. Whereas the elimination of the tubercle bacillus constitutes a difficult problem with intricate ramifications, vaccination, if effective, and without danger, would present a simple means of stamping out the scourge of tuberculosis. Witness the

efficacy of typhoid inoculations and the success of small pox vaccinations.

Attempts at vaccination when well controlled should not be condemned. Animal experimentation along this line should be strongly encouraged. In this measure, if effectual, lies the easiest solution to the eradication of tuberculosis. The fervent hope and ardent desire of all should be for the elaboration of a safe method in which adequate protection against tuberculosis can be afforded by vaccination. Until this end is achieved, deliberate, persistent, intelligent, and courageous attempts must be made to diminish the sources of tuberculous infection.

#### THE SURGERY OF TUBERCULOSIS

The practitioner who deals with tuberculosis should be as vitally concerned with the public health aspects of the problem, as in the treatment of those who suffer from the disease. Early removal of an open case as a source of danger to others should be a primary consideration in the treatment of any tuberculous subject. An undetected open case may be the starting point of many subsequent cases. Consider the harm wrought by a teacher with a slight hacking cough, unsuspected but exposing her young charges to infection with tuberculosis in her intimate daily contact with them. Treatment of the ill patient is indelibly linked with the significant item of prevention.

About 25 years ago, pulmonary tuberculosis was looked upon as a contraindication to surgery. Today, the most important role of surgery in the control of tuberculosis centers about the performance of collapse operations on the chest. Many patients who would otherwise menace their associates may be freed from this stigma through the agency of surgery and be restored to a life of health, activity, and usefulness. Pulmonary tuberculosis must be added to the varieties commonly known as surgical tuberculosis. The interest in the groups ordinarily listed under this caption hinges largely on the matter of treatment. In the absence of sinuses or fistulas, the danger of communication to others is not great. A brief sketch of the therapy in these so-called surgical types of tuberculosis would appear to be in order.

#### SURGICAL TUBERCULOSIS

A changing attitude of mind has been occurring in the field of surgical tuberculosis with reference to treatment. Tuberculosis of the bones and joints; of serous membrane and particularly the peritoneum; of the lymphatic system and of the genital and urinary apparatus constitute the

most common types, so called, of surgical tuberculosis. Tuberculosis is a disease with protean manifestations. Patients with surgical types of tuberculosis may be seen in which the joint or renal lesion may be the only one apparent on careful examination; in others, the surgical lesion may be only a lesser consideration with a pulmonary obviously playing the dominant role. All tuberculosis in adults, however, should be looked upon and treated in accordance with the admonition of Skoda, that a pulmonary lesion is the likely responsible source. In each instance conservative treatment for the lesion in the lung, even though not apparent, should be carried out for a period of months.

Whereas excision of tuberculous lymph nodes was an operation commonly performed by the general surgeon of two decades ago, it is an unusual circumstance that compels their surgical removal today. In large measure this change has come about through a decrease in frequency of this variety of tuberculosis, in which decrease the pasteurization of milk and the slaughtering of tuberculous cattle has been a significant factor. But it has been learned that there are other agents even more efficacious than surgical removal in the control of this variety of tuberculosis. The general hygienic measures so important in the management of all types of tuberculosis, viz.: bed rest, good food, fresh air and sunshine, together with the employment of heliotherapy and the treatment of the local lesions with X-rays have superseded surgery as agents of value in the treatment of such cases.

Spencer Wells unwittingly inaugurated the removal of ascitic fluid by operation, in cases of tuberculous peritonitis when operating under the mistaken diagnosis of ovarian cyst. The patient improved and the method became a vogue. Conservative treatment by virtue of better results has here also gradually replaced the more energetic surgical interference. Heliotherapy and the local employment of X-rays have proved more effectual therapeutic agents.

In the control of bone and joint tuberculosis, the age of the individual is a significant factor in determining the type of treatment. Before full growth of the part concerned has been attained, absolute rest obtained by immobilization together with the usual hygienic measures is the method of choice. In adults the healing period may be shortened materially by fusing the bony structures immediately contiguous to the tuberculous focus.

Renal tuberculosis with excavation is one type of tuberculosis that does not heal completely with

conservative measures. Most pathologists and clinicians of experience are in agreement that unilateral excretory tuberculosis of the kidney with evidence of destruction of the renal parenchyma as manifest in the pyelogram is an indication for nephrectomy. The ultimate results of nephrectomy [Braasch (1920), Wildbolz (1929), Persson (1925)], with an almost uniform figure of 60 per cent, 5 to 10 cures supports the validity of such a contention. Established excretory tuberculosis of the kidney treated conservatively usually ends disastrously (Persson).

Genital tuberculosis in the male usually concerns the prostate and the epididymis with the intervening vas deferens. When both are present, the initial lesion may be difficult to determine. Most conservative therapeutists hold to excision of the epididymis, contending that the prostatic lesion is frequently also influenced favorably thereby. Only a few advocate the radical operation of excision of the prostate and seminal vesicles for genital tuberculosis originating in the prostate. It is to be emphasized that an epididymal lesion should not be taken lightly and neglected. If ignored, it may destroy the testis and threaten other organs.

Tuberculous salpingitis is often associated with tuberculosis of the peritoneum in the female. (Statistically, tuberculosis of the peritoneum appears to be just as frequent among males.) The ascitic and adhesive varieties of tuberculous peritonitis exhibit an unusual tendency to healing with conservative measures. The ulcerative variety is ordinarily fatal and operation for the removal of a probable source such as tuberculous Fallopian tubes invites the disaster of bowel fistula and is not likely to be followed by success. In event the disease persists in the Fallopian tubes when associated with a variety of tuberculous peritonitis that exhibits healing on a conservative regimen, it is best to defer their excision until the peritoneal lesion is well healed. Isolated tuberculous salpingitis when recognized is an indication for excision.

#### PULMONARY TUBERCULOSIS

Collapse therapy may conservatively be said to be the greatest contribution to the treatment of pulmonary tuberculosis since the institution of bed rest as a routine measure. It is manifestly impossible to obtain physical rest of the affected lung in tuberculosis without some means of compression. Rest in bed does not put the diseased lung at rest. About 25,000 times each day the lungs are inflated and deflated with respiration. How poorly would a tuberculous knee joint do with motion so ill controlled.

Despite this constant motion of the lungs, early tuberculosis well treated with bed rest and other adjuvant hygienic measures in patients with moderately good resistance, tends to heal surprisingly well. Surgical collapse measures that will prompt or encourage healing where conservative measures are inefficacious will alone be dealt with here. The effect of collapse therapy is largely mechanical, assisting the obliteration of tuberculous cavities and placing the diseased lung at rest. The altered blood and lymph flow in the lung incident to this compression favors fibrosis and the healing of tuberculous lesions.

#### SURGICAL METHODS OF COLLAPSE

Operative collapse therapy includes a variety of procedures of which artificial pneumothorax, phrenectomy, and extrapleural thoracoplasty are those widely employed. Intrapleural pneumolysis or the division of adhesive bands within the pleural cavity with a high frequency current under the guidance of vision, may render an inefficient pneumothorax effectual. Apicolysis, a procedure considerably older than thoracoplasty, though of value in selected cases, does not enjoy general favor. Its effect may be reinforced by paraffin filling, a free fat transplant or a pedicled muscle graft. Multiple intercostal neurectomy and external drainage of tuberculous cavities are employed by a few phthisio therapists in the treatment of tuberculosis. Some of the essentials relating to the selection of cases, the technique, and the results of the commonly practiced methods (pneumothorax, phrenectomy, and thoracoplasty) will be briefly outlined.

#### DEGREE OF PULMONARY COMPRESSION OBTAINED

An effectual pneumothorax is the most efficient means of obtaining pulmonary collapse and rest. In the absence of adhesions, the introduced air surrounds the lung on each side and compresses it like one squeezes a sponge, shrinking the lung down to a small mass at the hilum. The effects of phrenectomy and extrapleural thoracoplasty operate from one side only. Paralysis of the diaphragm obtained through phrenectomy Brunner (1924) found experimenting upon an anatomical model decreases the original volume (2400 c.c.) of the pleural cavity by 600 to 900 c.c. Though the compression of the lung from beneath is continuous and permanent with complete interruption of the phrenic nerve, the diminution in vital capacity is usually only transient. A material reduction in the capacity of the thoracic cage and a permanent diminution of the vital capacity accompanies the performance of extrapleural thoracoplasty. The

resultant visual deformity after thoracoplasty is surprisingly slight.

#### INDICATIONS FOR COLLAPSE THERAPY

*Pneumothorax*—Indications for the employment of pneumothorax vary within wide limits. In recent years, there has been a tendency amongst phthisiotherapists of experience to be more aggressive in the employment of this therapeutic agent. Whereas previously, a unilateral type of tuberculosis that remained stationary under continued conservative treatment was the primary consideration dictating the use of compression of the lung with air, pneumothorax now is used much earlier in the course of treatment. The pyramiding of the effect of pulmonary compression upon the beneficial influence of bed rest in such a patient enhances the likelihood and shortens the time of the recovery. When the status of the case has been well established, there is no rationale in withholding this therapeutic aid to see what can be accomplished without it. Hemoptysis and tuberculous pleurisy with effusion are indications for the institution of pneumothorax therapy.

Disease in the opposite lung may be influenced favorably by securing compression of the worse lung. The same risk of disseminating a tuberculous focus by the institution of collapse does not obtained in pneumothorax as in the more formidable procedure of thoracoplasty. Consequently, pneumothorax may be employed with advantage in the treatment of some exudative and pneumonic types of tuberculosis. In recent years, bilateral pneumothorax has been employed with some success in bilateral forms of disease. The results of this expedient are largely palliative, however, and more lives will be salvaged by institution of effective treatment and collapse earlier in the course of the disease.

*Phrenic Neurectomy*—This little operative procedure is so easily borne by the patient that an unusual zeal has been demonstrated in some quarters to have every patient with tuberculosis submit to it. Like pneumothorax, it may ordinarily be used with advantage and impunity in exudative types of lesions. It exhibits its greatest worth in the treatment of basal lesions, in which the effect of compression is most direct. Apical cavities not infrequently, however, collapse surprisingly well under the influence of diaphragmatic paralysis. Even when the diaphragm is apparently fixed by adhesions as determined by fluoroscopic examination, an unexpected rise is often observed after the lapse of some months following interruption of the phrenic nerve. As an ancillary to ineffectual

collapse of the base of the lung with pneumothorax or as an accessory to other means of partial collapse, phrenectomy is a measure of great value; in checking the recurrence of effusions following pneumothorax, for the control of threatening hemoptysis; for the relief of a distressing cough and as a preliminary to thoracoplasty, especially when considerable sputum is present phrenic exaeresis exhibits great usefulness. For right sided lesions, demanding thoracoplasty, I prefer to postpone division of the phrenic nerve until the division of the ribs has been completed; if the phrenectomy is done first, the incompressible liver rises into the thorax and as good a collapse of the lower lung is not obtained later by rib resection. Occasionally, the result of phrenic nerve interruption is so surprisingly good that it is always well in borderline cases suggesting the necessity for thoracoplasty to allow some months to intervene before urging the performance of thoracoplasty. A few patients will be spared the operation by this precaution. I have not found the "strain," placed on the other lung exhibiting some disease, incident to the temporary diminution of vital capacity accompanying phrenic exaeresis to be of any value as a test operation to denote how well the better lung will bear up under thoracoplasty.

*Extrapleural Thoracoplasty*—Patients with a unilateral chronic proliferative type of tuberculosis, in which rest and compression of the diseased lung with pneumothorax is ineffectual because of adhesions and in which other more conservative measures have proved of no avail are candidates for thoracoplasty. Unless the lesion necessitates a thoracoplasty, it is always well to let 3 to 6 months intervene after phrenic interruption before urging more compression. Exudative types of tuberculosis are to be deliberately avoided. No patient should be advised to submit to thoracoplasty until he has had well supervised bed rest or sanatorium care for a year. This precaution insures elimination of patients with exudative and progressive forms of the disease. Patients exhibiting in the diseased lung some evidence of healing; viz.: fibrous, fibro-caseous or cavernous tuberculosis with scar tissue protection in the lung, presenting retraction of the mediastinal structures as shown by deviation of the trachea toward the affected side are suitable cases for thoracoplasty. A persistent tuberculous empyema with a parenchymatous lesion necessitating compression is usually an obligatory indication for thoracoplasty.

Unfortunately, many cases who otherwise ful-

fill all the requisites for thoracoplasty present some evidence of tuberculosis in the other lung. Whereas pneumothorax may be lightly undertaken in such instances, thoracoplasty for the worse lung must be carefully considered because of the danger of lighting up the disease in the better lung. Any evidence of progression in the better lung is a contraindication to thoracoplasty. The general condition of the patient, the absence or presence of febrile bouts, the physical findings, successive X-ray examinations and the reaction of the patient to slight exercise or activity determine in such a patient whether thoracoplasty may be done with safety.

By accepting unfavorable cases for operation, the surgeon frequently shortens the lives of the patients and may bring the operation into discredit. At the same time, it may be said that cases presenting absolute indications for thoracoplasty, such as a large cavity in a lung that has remained refractory to all conservative methods of treatment should not be denied the advantages that thoracoplasty offers. Too frequently such patients are referred for surgery only when they no longer do well. The careful selection of cases is fully as significant as skillful performance of the operation. In the good risk patient, one resects enough of the bony chest wall in 2 or 3 stages to effectually compress the diseased lung. It is my impression, however, that some borderline cases may be accepted for operation if one will decide to be satisfied initially with only a partial collapse of the worse lung. A single upper stage operation removing from 5 to 7 ribs depending upon the condition of the patient and the rigidity of the lung beneath the area of rib removal is in my experience well tolerated by such patients. It is usually in one's anxiety to increase further the compression in a doubtfully acceptable case by another seance of rib removal that the disastrous spread of the disease in the better lung is encountered. If improvement attends the single stage, but the compression is not as effectual as desired, I have, in a number of instances, done an antero-lateral costectomy after 4 to 6 months later. A greater degree of chest wall collapse is usually obtained by this procedure remotely (after rib regeneration has occurred) than by the addition of a lower stage thoracoplasty.

Tuberculosis of the larynx per se is not a contraindication to thoracoplasty. Though tuberculosis enteritis is generally considered to be, I recall one patient with this complication operated upon by the late Dr. Law at the University Hospital more than 5 years ago, who though not well,

presents a distinct improvement in her condition. A failing heart is an absolute contraindication to thoracoplasty. Age is not an important factor granted that the patient is in good condition. I have twice done a two stage thoracoplasty in patients past 50 years without undue operative reaction.

#### TECHNIQUE

Long ago in Germany, Brauer, an internist who was largely responsible for the introduction of thoracoplasty, undertook the surgical procedures necessary in the care of patients with pulmonary tuberculosis himself. This precedent has been followed in many quarters and is perhaps the ideal arrangement, when he who essays to deal with tuberculosis becomes master of both diagnostic and therapeutic agents. The effectiveness of combination of phthisiotherapist and surgeon in one person is well demonstrated in the brilliant work of Ralph C. Matson of Portland. On the whole, however, the care of tuberculous patients is a joint responsibility in which internist, roentgenologist, and surgeon each have an important function. In a clinic in which suppurative non-tuberculous diseases of the chest also are treated, a bronchoscopist with a knowledge and interest in thoracic disease is an integral and indispensable part of such an enterprise.

*Pneumothorax*—Two glass cylinders in a portable box with a mercury manometer in the circuit constitutes the essential apparatus necessary for the production of pneumothorax. For the first inflation, many prefer oxygen or carbon dioxide in order to obviate any risk of gas embolism accompanying accidental puncture of the lung. The punctures are made under local anesthesia and the patient should be in the recumbent position to minimize the chances of cerebral air embolism. The first inflation should ordinarily be only about 300 c.c., unless done for hemorrhage. Complete collapse of the lung should only be gradually attained by subsequent refills in order to avoid dyspnoea and unnecessary reactions. Once collapse is attained, refills are necessary only to make good the loss of gas by absorption. The optimum intrapleural pressure to be maintained is that which affords an efficient collapse without discomfort or reaction.

*Phrenectomy*—A short transverse incision an inch in length under novocaine infiltration at the posterior border of the sternocleido-mastoid muscle, an inch above the clavicle, gives direct access to the phrenic nerve on the scalenus anticus muscle. At this point, the anterior scalene and sterno-cleidomastoid muscles are separated only by a small pad of fat. As soon as the fat pad is reached (it may be cut through or pulled

medially) the index finger should be inserted into the wound and the scalenus anticus muscle palpated. Almost invariably, the phrenic nerve may be distinguished as a tiny cord lying upon the muscle. No electrical apparatus is necessary to identify the nerve. It is the only structure lying over the scalenus anticus muscle running in a slightly medialward direction. The nerve is then brought into direct vision by adjusting the retractors (I employ eye-lid retractors), injected with novocaine and isolated by passing a curved hook beneath it. The nerve is seized with a hemostat or Proctor's phrenic nerve forceps and divided above the forceps. By gradually twisting the distal portion of the nerve on the tip of the hemostat, the entire nerve can usually be avulsed in this manner. Simple division of the main trunk of the nerve may fail to produce the desired effect because of the presence of accessory branches. Avulsion or exaeresis of the main nerve insures severance of accessories unless a separate branch goes all the way to the diaphragm. Avulsion of 5 inches or more of the nerve usually serves to insure interruption of accessory branches. In event the nerve trunk breaks before this amount is satisfactorily avulsed, the first bundle of the brachial plexus should be inspected at the lateral border of the scalenus anticus and any branches coursing medialward over that muscle should be divided. In performing exaeresis of the phrenic nerve, care should be taken that no adventitious connective tissue is twisted with the nerve. This precaution will obviate hemorrhage. Though unusually intimate relations of nerve and vessels have been described and exaeresis discouraged because of it, we have not encountered an instance of bleeding in phrenic avulsions done at the University Hospital (87 for tuberculosis and more than 100, including instances of bronchiectasis). There were no deaths; the only complication noted was a temporary sympathetic paralysis (Horner's syndrome) which occurred in 2 instances.

*Extrapleural thoracoplasty*—The ideal thoracoplasty would be a one stage operation but the magnitude of the procedure contradicts its performance. The orthodox operation usually consists of 2 stages in which paravertebral segments of the upper 11 ribs are removed. Most American surgeons follow the suggestion of John Alexander and do the upper stage first, removing segments of the upper 5 or 6 ribs and of the remaining lower ribs including the eleventh at a subsequent sitting about 3 weeks later. In order that the most efficient collapse be attained, the second operation should, whenever feasible,

be done within 5 or 6 weeks after the first operation because of the regeneration of bone again from the periosteum.

I prefer to operate under ethylene anaesthesia, the patient being placed in the lateral decubitus to afford the patient adequate ventilation of the lungs, no limitation of expansion at the costal cartilages being imposed on the patient in this posture. Four ounces of one per cent novocaine with 20 minims of adrenalin are injected into the muscles to be divided to minimize capillary oozing. The incision is made a hand's breadth lateral from the spinous processes, the lower end of both upper and lower incisions curving gently outward.

In apical lesions with large cavities, or in the presence of a resistant lung beneath the pleura, it is important to remove wide segments of the upper 2 or 3 ribs especially. All ribs are divided posteriorly at the articulation with the transverse process. The first rib can be easily divided as far forward as the groove for the subclavian artery, the rib being cut at the insertion of the scalenus anticus muscle. With detachment of the scalenus posticus from the second rib, it can be divided as far forward as the lateral margin of the costal cartilage through the posterior incision. The length of removal of ribs beyond the third should be determined largely by the condition of the underlying lung. When the pleura and lung move freely in the wound, it is wise not to remove too long segments of the lower ribs, because of the danger of mediastinal flutter and dyspnoea. When the lung is thick and resistant, wide segments, running well beyond the lateral border of the scapula, can be removed.

Thoracoplasty aims at obliteration of cavities or effective compression of a fibrotic lung. In event that the typical two stage posterior thoracoplasty does not adequately accomplish this, it is advisable to do a subsequent antero-lateral costectomy through a vertical axillary incision spaced between the pectoralis major and the latissimus dorsi muscles.

In the timing of the sequence of operations, the determination of the vital capacity is an important agent. Occasionally a surprising reduction of vital capacity attends thoracoplasty (to 700 or 800 c.c. sometimes). In such instances, it is wise to delay the second operation until the maximum increase in vital capacity has been attained. I have found the vital capacity a more certain guide, than the frequency of respirations or general reaction of the patient in deciding the optimum time for subsequent operations.

**Mortality**—Since the establishment of a special service for the surgery of pulmonary tuberculosis

at the University Hospital in 1929, 61 patients have been submitted to extrapleural thoracoplasty upon whom more than 120 thoracoplastic operations have been performed. There have been 10 hospital deaths. Most of these cases come from the State and County Sanatoria and remain until they can safely return. The usual length of hospital stay in such instances when the complete operation is done is between 10 and 12 weeks; some have remained for shorter intervals and a few for considerably longer. One of these deaths was a suicide for which operation was in no way responsible. The mortality directly or indirectly attributable to operation (9 deaths) was 14.4%. Two deaths (3.27%) were directly attributable to operation. One of these was an asthmatic of 43 who had been invalided for several years because of persistent asthma associated with tuberculosis. She died of mediastinal flutter and unrelieved asthma 3 days after operation. Another poor risk patient died of shock 4 hours after operation. (The warning of a systolic blood-pressure persisting below 100 mm.Hg. here should have been an indication for transfusion of blood). Two patients died on the 11th and 19th days respectively after the second stage operation of causes related to the operation; one of pneumonia; the other of wound infection, pneumonia and adrenal hemorrhage. One died on the operating table under anaesthesia as the skin incision was being made. Post mortem examination disclosed a brain tumor (pituitary). Four patients (6.8%) died from extension of their tuberculosis (21 days after first operation; 92 days after first operation complicated by a transverse myelitis infectious in nature; 5 days after second operation; and one patient with tuberculous empyema and a draining sinus died of amyloid disease remotely after a 2 stage thoracoplasty.

None of the deaths occurred in distinctly favorable cases. Three of the fatal cases were classed among the conditionally favorable group of which only one died of a spread of his tuberculosis, the other two of causes related to operation being the patients that died of pneumonia and adrenal hemorrhage mentioned above. The brain tumor death; the two purely operative deaths (mediastinal flutter and shock); and the three remaining cases that died of spread of their tuberculosis all came in the poor risk or unfavorable group from the standpoint of their tuberculosis.

These figures attest the significance of careful selection of patients for thoracoplasty. The unfavorable risk should only be accepted with a full understanding of the hazards. I have continued to operate upon selected cases of this group

as indicated under the caption of indications feeling that surgery holds out to them their only hope for improvement and among cases of this group, there have been adequate successes to justify the hours of discouragement, anxiety and regret caused by the unhappy outcome of the fatal cases.

If one wished to improve materially the immediate as well as the remote results of thoracoplasty he would deliberately avoid all poor risk patients. If the hazards are not too great and a fair chance exists for cure or material improvement if the operation is tolerated, I feel that this remedial agent should not be withheld. A conscientious surgeon should not look only to a good "batting average" but should accept his responsibilities to these unfortunate individuals. To operate, however, only because no other form of treatment holds out any promise is foolhardy and is to be deprecated. The acceptance of a poor risk should depend upon what may be gained by a successful issue.

In Bull's report (1930) of the Norwegian material, (401 thoracoplasties) the mortality at 3 months was 13.5 per cent; at the end of one year 18 per cent of the original group were dead. Not sufficient time has yet elapsed to evaluate the end results in our group.

RESULTS

Through the employment of collapse procedures, the convalescence of many patients who probably do well on bed rest alone may be hastened. A far larger group are grateful for the benefits of the compression in that they may be restored to a life of usefulness and activity. A rather large proportion of the patients referred to above in the thoracoplasty series had spent several years under continuous supervised bed rest without manifest improvement. A surprising number had been more or less continuously in bed from 7 to 15 years. To such patients to whom life seems so futile, collapse therapy comes as a great boon, affording them hope and encouragement.

*Pneumothorax*—Statistically collapse therapy readily proves its worth. In a review of 600 cases of pulmonary tuberculosis treated by means of artificial pneumothorax, Matson, Matson and Bisailon (1923) report the following results:

	No. of Cases	Clinically Well	Arrested Ambulant	Dead
Satisfactory compression- ing .....	235	114-48.5%	44-18.7%	52-22%
Partial compression .....	245	28-11.4%	29-11.8%	142-58%
No free pleural space (control cases) .....	120	7- 5.8%	11- 9.2%	80-66.6%

From the Laennec Hospital in Paris, Rist 1927 reports results comparing the status of patients in whom pneumothorax was successful with those in which pneumothorax could not be successfully carried out because of adhesions and also with another group who refused pneumothorax.

I. SUCCESSFUL PNEUMOTHORAX GROUP (759 CASES)

1. Healed .....	51 cases— 6.5%	} 52%
2. Clinically well, symptom-free, working but still under treatment .....	336 cases—45.5%	
3. Conditions unchanged .....	33 cases— 4.0%	} 48%
4. Bilateral (alive) .....	99 cases—13.5%	
5. Deceased .....	240 cases—30.5%	

II. CONTROLS (ADHESION GROUP)—(94 CASES)

1. Able to work .....	8 cases— 8.5%
2. Living in institutions (unable to work, con- ditions unchanged or worse) .....	35 cases—37.2%
3. Deceased .....	51 cases—54.2%

III. CONTROLS (REFUSALS)—(74 CASES)

1. Condition unchanged .....	13 cases—18%
2. Worse .....	21 cases—29%
3. Deceased .....	39 cases—53%

*Phrenectomy*—The appraisal of phrenectomy as a single therapeutic measure is difficult to evaluate. Most of those who employ it frequently extol its virtues. It is so frequently employed as an auxiliary to other methods of compression that it is probably fair to say that this is its greatest merit.

*Extrapleural thoracoplasty*—In his monograph on the "Surgery of Pulmonary Tuberculosis" John Alexander found in an analysis of 1159 thoracoplasties reported between the years 1918-1925 that 36.8 per cent were cured, and 24.4 per cent in addition exhibited improvement. Thoracoplasty had therefore influenced favorably 61.2 per cent of the cases. Of the remainder, 5.25 per cent were unimproved or worse; 14.1 per cent died from causes directly or indirectly connected with operation, and 19.4 per cent died from causes not directly connected with the operation but chiefly from tuberculosis in the unoperated lung.

At the Seventh Conference of the International Union against Tuberculosis held at Oslo in August, 1930, Professor Bull reported that 69 per cent of his own 168 cases were benefited by operation; of the remaining 31 per cent, one half derived no benefit from the operation and the other half died incident to the operation or prematurely because of it.

From 35 to 45 per cent of patients with chronic tuberculosis who cannot be helped by other means, Bull believes may be cured and rendered fit for work by thoracoplasty. This is indeed a remarkable achievement and a fitting tribute to the men whose pioneer labors have placed this measure of relief at the disposal of those who need it.

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### THE 1932 CAMPAIGN

The Journal-Lancet presents this special tuberculosis number in an attempt to be of service to the National Tuberculosis Association in its 1932 campaign. In 1928 the National Tuberculosis Association initiated an early diagnosis campaign with the slogan, "You May Have Tuberculosis, Let Your Doctor Decide." This was so popular and productive of good results throughout the nation, that a scheme was evolved for a series of such campaigns, emphasizing the diagnosis of early tuberculosis.

Inasmuch as it was well known that many children become infected with tubercle bacilli and that many so infected fall ill and die during the teen ages and early twenties, it was decided to emphasize the importance of the childhood type of tuberculosis in 1930, with the slogan, "Protect Them (Children) From Tuberculosis," and to follow this in 1931 with an attack upon the disease in the high school age with the slogan, "Tuberculosis, The Foe of Youth." This year emphasis is placed upon the communicability of tuberculosis, the slogan being, "Tuberculosis Causes Tuberculosis—Every Case Comes From Another."

The National Conference of Tuberculosis Secretaries has been largely responsible for these campaigns, beginning when Mr. Will Ross of Milwaukee was president of that organization. This year Mr. H. M. Cass of Huron, South Dakota, is the president of this organization and he with Dr. Kendall Emerson, Managing Direc-

tor, and Dr. H. E. Kleinschmidt, Educational Director, of the National Tuberculosis Association, and various Committeemen have developed a marvelous program.

It is doubtful whether there has ever been so much interest manifested by the medical profession in tuberculosis as at present. This, we believe, is due in no small part to the activities of the National Tuberculosis Association. In all of its campaign work, this organization has cooperated with the medical profession, having in mind the following last words of Osler to the general practitioner on the subject of tuberculosis:

"The leadership of the battle against this scourge is in your hands. Much has been done, much remains to do. By early diagnosis and prompt, systematic treatment of individual cases, by striving in every possible way to improve the social condition of the poor, by joining actively in the work of the local and national anti-tuberculosis societies you can help in the most important and the most hopeful campaign ever undertaken by the profession.

J. A. M.

### THE GENERAL PRACTITIONER AND TUBERCULOSIS CONTROL

This year we are celebrating the fiftieth anniversary of the discovery of the tubercle bacillus by Robert Koch. Fifty years ago very little was known about tuberculosis, except that its victims rarely recovered and it caused more deaths than any other disease. Following the discovery of the bacillus the diagnosis of tuberculosis depended almost entirely on finding the germs. Naturally most cases were far advanced before being diagnosed and with the crude methods of treatment in vogue at that time, very few recovered. Conditions have undergone a marked change since then. Especially in the last twenty-five years, great improvements have been made both in the diagnosis

and treatment of tuberculosis. Until recently the medical schools taught little of value about tuberculosis, the most common of all diseases. Physicians graduated without adequate knowledge of combating it. They were not to be daunted, however, and have kept up with the progress that has been made in the campaign, even though engaged in active practice. They have shown a commendable interest in the fight against the white plague, the leader, until recently, in the cause of death.

This interest is evidenced when one considers the fact that more practising physicians have registered for the annual short courses in tuberculosis given by the Southwestern Minnesota Sanatorium than could be accommodated. The short courses given by other tuberculosis sanatoria of the country have been unusually popular. Here is the evidence that interest is not lacking on the part of the general practitioner in the control of tuberculosis. They are anxious to equip themselves so they may be better able to cope with this foe of the human race. They can not be complimented too highly for this progressive attitude in giving their time to become better fitted for their part in the fight. Complete success depends largely on the general practitioner; at least he might be termed the foundation upon which the control of tuberculosis rests. He is the one who most often is the first to see the patient and his early diagnosis will give the patient a chance to recover and also protect those with whom he comes in contact. Realizing that each case of tuberculosis comes from another he will endeavor to find the source of infection. Also appreciating the fact that anyone exposed in the home of a patient with tuberculosis is generally infected with the disease, the physician will observe the other members of the family as a precaution to protect them from developing the disease in a clinical form.

The use of the tuberculin test is becoming increasingly valuable in the control of tuberculosis. It is now recognized that the percentage of those reacting early in life is not as high as had been generally taught. When a child of school age reacts to the tuberculin test one can be reasonably certain he has been exposed to tuberculosis in the home. This makes the test doubly valuable, for it not only shows who has been infected, but gives one a chance to hunt up the source of infection. In this way the source of the disease is found much earlier than in the past. This same source can be removed from the home in time to recover, as well as protect associates from further infection. The reacting child, being observed and made to live the proper life to keep

up resistance, will be protected from developing clinical tuberculosis.

Much has been accomplished in the control of tuberculosis. The death rate has been cut in half in the last twenty years. There is much yet to be accomplished but the future has never been brighter than at present. With earlier diagnosis and proper handling of the clinical case, early detection of infection in the child and proper precautions to prevent clinical tuberculosis more can be accomplished than ever before. The success will depend largely on the general practitioner. Considering the interest that is generally shown, it is only reasonable to feel that it will not diminish until this disease ceases to be one of the leaders as a cause of death.

S. A. S.

#### TUBERCULOSIS IMMUNITY

The uninfected infant, child or adult is not hopelessly at the mercy of the mycobacterium tuberculosis. Dating from the earliest infancy the normal human body manifests "natural powers of resistance," which prove remarkably efficient in enabling one at all periods of life to successfully withstand and overcome severe as well as mild primary tuberculous infections. The excellent power of resistance to tuberculosis with which man is endowed by nature is revealed by the observation of Hempelmann, Eliasberg and Neuland, DeBré and Joanan, Bernard and Paraf, Gerstenberger and Burhans, Kahn, Goldberg and Gasaul, Henricke and others, all of whom have noted the disappearance of extensive pulmonary infiltrations due to primary infections by the tubercle bacillus accompanied by restoration to normal health in young infants as well as in older children.

To physicians who have had an opportunity to study and follow such cases, which are by no means rare, the evidence is strongly convincing that the uninfected, non-allergic individual is remarkably well prepared by natural endowments to successfully meet the exigencies which arise when the first infection by the tubercle bacillus occurs. One, therefore, may be justified in wondering if our natural state of resistance which holds the primary tuberculous infection under such perfect control that few among the millions infected know when they became "tuberculin positive reactors" can be improved upon by any method known to medical science. One also may be justified in wondering if the individual who is rendered allergic as a result of a primary infection, and to whom thereafter tuberculin is an extremely toxic necrotizing tissue poison is placed

in an advantageous position as a result of this experience when reinfection occurs, as compared with the uninfected individual to whom tuberculin is relatively innocuous rather than toxic, and to whom is still preserved an unaltered natural resistance upon which accumulating evidence encourages reliance. It is indeed hard to find acceptable evidence in the literature, of deaths resulting from a proven single primary tuberculous infection. Natural resistance inherent in the uninfected human body, apparently provides a practically insurmountable barrier which commonly prevents a primary tuberculous lesion from progressing to the point where death ensues, through resolving and reducing such lesions to inconspicuous, non-fatal, calcified scars.

Following the first infection by the tubercle bacillus, the human body acquires new and abnormal capacities for reacting to the bacillus and its products. This experience causes, among other things, the development of a beneficial protective immunity which apparently is of relatively low grade, favoring destruction and localization of bacilli and increasing the tendency for fibrosis and chronicity of tuberculous lesions. This experience also results in the development of a detrimental and antagonistic allergy which, according to evidence available, is largely responsible for the toxic symptoms of tuberculosis, and for the widespread tissue necrosis and caseation so characteristic of the disease. In the light of present knowledge, therefore, one must conclude that in order for a net benefit to accrue to the individual as a result of a primary tuberculous infection, the degree of beneficial immunity acquired by this experience must definitely exceed the degree of detrimental allergy developed simultaneously. It is well known that the toxicity of tuberculin to tissue is tremendously increased in the allergic individual, but we do not know that the beneficial immunity acquired from a primary tuberculous infection shows an equally tremendous increase. The statement, therefore, that a primary tuberculous infection is beneficial to an individual is not founded on proven facts.

There is evidence that a primary tuberculous infection is distinctly detrimental, in that the soil may be prepared thereby for the development of the adult type of tuberculosis should the allergic individual subsequently experience a reinfection in sufficient dosage to produce an intra-pulmonary lesion. Light on this problem is revealed by the clinical observations of Myers, and Rathbun, indicating that the majority of consumptives are derived from the group who in the past have successfully withstood a primary tuberculous infec-

tion. To find that the majority of our consumptives comes from the group who have had the alleged benefit of a primary infection, supplies not only weak testimony for the efficacy of the immunity developed thereby, but also incriminatory evidence for the detrimental features of this experience. The tendency for a primary infection to prepare the soil for the development of the adult type of tuberculosis on reinfection is supported by certain experimental evidence. Bacmeister was able to produce typical apical phthisis in rabbits only when a previous tuberculous infection had occurred somewhere in the body. He concluded that for the production of typical phthisis a relative immunity of the body is necessary, and this is produced by an early primary infection.

Abundant evidence exists that a primary infection fails to prevent the development later of phthisis as shown by the large number of cases of adult pulmonary tuberculosis in which X-ray films reveal the co-existence of calcified scars identifying the location of the site of the primary tuberculous infection the patient once experienced. Until more definite proof is offered that the immunity acquired as a result of a primary infection is definitely and indisputably beneficial, we may find it most profitable to place our reliance upon the powers with which we are endowed by nature to combat the disease and extend our best efforts largely in the prevention of infection rather than to depend upon the questionable benefits of contamination.

C. A. S.

#### THE CONQUEST OF TUBERCULOSIS

The epidemiology of tuberculosis is not new, although its present form is such as will leave perhaps a deeper imprint upon anti-tuberculosis work than has ever before been made. Years before the discovery of the tubercle bacillus attempts were made to limit the spread of tuberculosis by means of public health measures. These attempts, however, were built more upon theoretical conclusions than scientific evidence. Even though many of their applications had in them the elements of truth, nevertheless they were not supported by enough proven facts to stand the test of bitter opposition. A striking example of this is evidenced by a Royal Decree issued by the King of Spain in 1753, at a time when tuberculosis was gaining such headway as to startle even Royalty. This decree had for its purpose the limiting of the spread of consumption by attempting to clean up the sources of infection. It provided that the clothes and belongings of one dying from tuberculosis should

be burned and the house carefully cleaned. It demanded a report of each case in the community by the local physician. Failure to make such a report resulted in a fine of 200 ducats (about \$400.00) and a one year suspension from the practise of his profession for the first offence; and 400 ducats and a two year exile for the second offence.

We do not know what effect these stringent measures had on the decrease of tuberculosis in that country during that period. Possibly the shifting opinion of that day was such as to destroy any good effects that might have eventually resulted from such a rigid program. At any rate the time was not ripe for the crusade which science was to sow against civilization's great destroyer of life. This occurred in 1882 when Robert Koch, leaving no loop holes for adverse critics, pointed very definitely to the cause of tuberculosis. Previous to this in 1865 J. A. Villemin had proved the infectiousness of this disease but Koch discovered the infective agent and upon that fact began the scientific program for the control of tuberculosis.

Robert Koch, after making his discovery was not satisfied to let matters rest. He could see in the practical application of his discovery a way to combat tuberculosis. In his first published paper on the subject on March 24th, 1882, he made this prophesy: "When the conviction that tuberculosis is an exquisite infectious disease has become firmly established among physicians, the question of an adequate campaign against tuberculosis will certainly come under discussion and it will develop itself." Such a campaign did develop, its chief principles being the official notification of tuberculosis cases to health departments and the finding and removing of sources of infection. It was slow, painful work, filled with obstacles thrown in the way by both lay and medical people of prominence. In our own country Hermann Biggs, physician, sanitarian and statesman took a leading part in developing this program in the City of New York. His splendid work in this respect gained world-wide recognition, and from it flew the sparks that lighted other cities to similar activities.

In the recommendations given by Biggs to the Board of Health in 1893 we find almost the same plan that we are following today in the epidemiology of tuberculosis. He proposed first, the education of the public by circulars, talks and other methods for the dissemination of knowledge on tuberculosis; second, the reporting of cases to the health department by institutions as well as

by private physicians; third, the isolation of consumptives when found in general hospitals; fourth, facilities for the examination of sputum by the health department; fifth, the establishment of an institution for the tuberculous; and sixth, the assignment of special inspectors for the investigation of sources of infection. The recommendations were adopted by the Board of Health and so the City of New York began its pioneering in the field of tuberculosis epidemiology.

The growth and expansion of this type of work is a thing of history. Today with the tuberculin test and the X-ray added to the field of searching we have given a great impetus to the epidemiology of tuberculosis. More than ever before we realize the necessity of finding and removing sources of infection, and now more than ever before we find in our hands a set-up at once conducive and promising for the successful carrying out of these plans. The placing of an epidemiologist at the Minnesota State Sanatorium is a definitely progressive step toward a more effective control of tuberculosis in our state. That together with the epidemiological work carried on by the County Sanatoria, the State Board of Health, and the Minnesota Public Health Association makes us feel that, with due co-operation, great results can be expected from the present program for the control of tuberculosis.

A. S. ANDERSON, M. D.

## SOCIETIES

### Hennepin County Medical Society

Program April 4, 6, 13, 1932

MONDAY, APRIL 4, 7:45 P. M.

Society meeting; nomination of officers; committee reports.

Address: "Presentation of Post-operative Cases of Thyro-glossal Duct Cyst," J. M. Hayes, M.D.

Address: "A Review of Ovarian Cysts; Based on Records in Eleven Minneapolis Hospitals, 1920-1930." S. B. Solhaug, M.D.

WEDNESDAY, APRIL 6, 1:00 P. M.

Case Reports—"Report of a Case of Hook Worm Disease," J. S. Milton, M.D.; "Myomectomy During Pregnancy," H. P. Linner, M.D.; "X-ray of the Mastoid," G. T. Nordin, M.D.; "Unsuspected Tuberculosis Revealed by Application of Tuberculin Tests." R. H. Lindquist, M.D.; "Tuberculosis Survey at the Swedish Hospital," Wm. Mills, Supt.; "Unsuspected Lues Revealed by the Routine Wassermann Test," Chas. R. Drake, M.D.

WEDNESDAY, APRIL 13, 1:00 P. M.

"The Diagnosis of Chronic Ulcerative Colitis," H. F. Bayard, M.D.; Discussion: E. L. Gardner, M.D.; "Pericarditis with Effusion: Treatment with Pneumopericardium," M. H. Nathanson, M.D.

## NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Dr. J. E. Witters, from Charlevoix, Mich., has decided to locate at Eureka, S. D., and has opened offices for general practice.

Dr. B. H. Sprague, well known surgeon of Huron, S. D., has sold his practice and will make his future home at Hollywood, Cal.

Dr. B. S. Rundle, who has been located at Circle, Mont., for several years, has opened offices for general practice at Denton, Mont.

Dr. Leo Weiss formerly of New York City, has become an associate of Dr. J. J. Kolars, at Le Center, Minn., in general practice.

Dr. T. A. Griggs, who has been in active practice at Butte, Mont., for the past forty years, died last month from a sudden attack of heart trouble.

Mrs. Hugh Tunstead, was elected president of the Woman's Auxiliary of the Hennepin County Medical Society, at the annual meeting held last month.

Dr. F. C. Rodda, Minneapolis, was the guest speaker at the March meeting of the members of the Washington County Medical Society held at Stillwater.

Dr. Edward L. Tuohy, Duluth, was one of the principal speakers at the annual meeting of the Minnesota Association for Crippled Children recently held at St. Paul.

Dr. T. J. Sullivan, Butte, Mont., has resigned as a member of the State Board of Health, as he will be absent from the state for several months during the present year.

Dr. H. M. N. Wynne, Minneapolis, attended the meeting of the American Association of Obstetricians, Synecologists and Abdominal Surgery at Philadelphia March 7th, 1932.

Dr. R. A. Crawford, superintendent of the Chamberlain Sanitarium at Chamberlain, S. D., has been confined to his bed for some weeks with a serious attack of pneumonia.

Dr. Charles F. Lewis, a prominent physician and surgeon who had been in active practice at Austin, Minn., for over thirty years, died this month at the age of 64 years, after a long illness.

Sixty members of the Western Montana Medical Society attended their monthly meeting at Missoula on March 10th. A. N. Whitlock, attorney, was the guest speaker, his topic being "Medical Jurisprudence."

Dr. A. N. Collins was the principal speaker at the monthly meeting of the members of the Duluth Nurses Association last month. He presented a very interesting paper on "The Treatment of Osteomyelitis."

Dr. W. F. Cogswell, secretary of the State Board of Health of Montana, has made the announcement that their state is the first one in the United States, to establish a health board for the exclusive use of the Indians.

Dr. M. Mc. Fischer, secretary of the St. Louis County Medical Society, has been appointed director of public health for the city of Duluth. The doctor is a 1924 graduate of the University of Minnesota Medical School.

Sanction of the Council of the Minnesota State Medical Association has been given for a survey of cancer statistics of Minnesota to be undertaken under the auspices of the American Society for the Control of Cancer.

Funeral services were conducted for Dr. Herman A. Maves, aged 52 years, Minneapolis Dentist and professor of oral surgery at the University of Minnesota, who died March 22d at Abbott Hospital.

Dr. Leonard G. Rowntree, Professor of Medicine, University of Minnesota, and senior consultant in medicine and director of clinical investigation of the Mayo Clinic for twelve years, has been chosen medical director for the Philadelphia Institute for Medical Research.

A three days' meeting of the public health nurses and members of county committees was held at the University of Minnesota on March 23, with an attendance of over 300 members. Some 50 specialists were on the program all presenting interesting papers on health problems.

Dean E. P. Lyon, of the University of Minnesota, was in Chicago recently and warned a group of hospital and public health nurse experts that four times as many nurses as are needed are being trained annually. Private case nurses average five days' work a month in Minneapolis, he said.

Dr. E. A. Meyerding, St. Paul, secretary of the Minnesota State Medical Society, was the principal speaker at the annual meeting of the

Minnesota State Pharmaceutical Society held in Minneapolis. Dr. Meyerding's subject was "Human beings will not permit themselves to be standardized."

Dr. Avery D. Prangen, Rochester, Minn., was the guest speaker at the midwinter meeting of the North Dakota Academy of Ophthalmology and Oto-Laryngology, Fargo, February 13; his subjects were "Early Management of Strabismus, Operative Treatment of Strabismus, and Problems and Procedures in Refraction."

The 1932 Committee on Public Health Nursing for the Minnesota State Association is to be headed by Dr. Harry Oerting, St. Paul. Other members are Dr. George A. Earl, St. Paul; Dr. C. B. Wright, Minneapolis; Dr. H. R. Tregilgas, So. St. Paul; Dr. W. H. Eude, Minneapolis; Dr. T. E. Flynn, Redwood Falls, and Dr. C. E. Caine, Morris.

The March meeting of the Sioux Falls Medical Society was held at Sioux Falls, with a large number of members present. The guest speaker was Dr. Hendrie W. Grant, of the Ophthalmology Department at the Miller Clinic, St. Paul, who presented papers on "Fundic Changes in General Diseases," and on the "Treatment of Minor Injuries of the Orbit." His talk was given for the benefit of the doctor in general practice.

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters). Speaker, William A. O'Brien, M. D., Associate Professor of Pathology and Preventative Medicine, Medical School, University of Minnesota. The program for the month of April will be as follows: April 6—Personal Hygiene—Rest and Sleep; April 13—Leg Cramps; April 20—When Pneumonia Begins; April 27—Spinal Cord Tumors.

Harry A. Hansen entered a plea of guilty to practicing healing without a Basic Science Certificate on March 9, 1932, before the District Court in Duluth. After admonishing the defendant to comply with the Medical Laws of this State and informing him that a second violation of these laws would result in a straight Work-farm sentence without the opportunity to pay a fine, the Judge imposed a fine of \$150 which the defendant paid. Hansen is 58 years of age and for the past four years has been holding himself out at Duluth, as the maker of "Master Medicines." He has been specializing in the treatment of heart ailments, tuberculosis, ulcers of the stomach and

rheumatism. Hansen informed a representative of the State Board of Medical Examiners that he had the only cure in the world for tuberculosis which he was selling for \$3.00 per two ounce bottle. People would go to Hansen's office where he would discuss with them their symptoms and he would then recommend his preparations. He charged \$5.00 per two ounce bottle for his heart medicine. Hansen claims to have no medical education nor has he studied pharmacology except that obtained from reading books in his office. He claims to have his knowledge bestowed upon him in answer to a prayer.

## CLASSIFIED ADVERTISEMENTS

### PHYSICIAN WANTED

Town of 2,000, County seat in South Dakota. Established practice. Office available, fully equipped. Furniture, library, electric appliances and instruments for sale. This is an unusual opportunity. Address Box 901 care of this office.

### OFFICE FOR RENT

Doctor's office occupied by prominent physician. Office elegantly equipped. Individual treatment rooms, laboratory, etc. Reception room is shared with busy dentist and other physicians. A new up-to-the-minute medical building located in best business intersection of good residential district. This is an unusual opportunity and must be seen to be fully appreciated. Address Box 895, care of this office.

### FOR SALE

McCaskey Register System for case records, consisting of register, top unit, two extra filing sections and base. In excellent condition. Cost \$179.00. First check for \$50.00 takes it. Not Delivered. Dr. Arthur Edward Smith, 503 Donaldson Bldg., Minneapolis, Minn.

### MEDICAL SECRETARY

A reliable and capable medical stenographer-secretary desires position in Minneapolis. Can take charge of office and also assist in treatment rooms. Highest references furnished. Address Box 902 care of this office.

### TECHNICIAN

Young lady technician would like position in Hospital, Clinic or Doctor's office. Experienced in x-ray physiotherapy and all clinical laboratory procedures. Outside of Twin Cities preferred. Good references. Address Box 900, care of this office.

### TECHNICIAN

An experienced x-ray, laboratory and physio-therapy technician would like position in Doctor's office, Clinic or Hospital. Can do typing, Basal metabolism and can give ether anesthesia. Good references. Address Box 904, care of this office.

# THE JOURNAL-LANCET

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## Carcinoma of the Rectum\*

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Minneapolis*

THIS paper is intended as a brief survey of the subject of rectal cancer, an evaluation of the methods of treatment, and other points of interest to the general practitioner, rather than as a technical description of any particular operative procedure. Since the paper is confined to rectal cancer, we will not concern ourselves, in as far as operative procedure is concerned, with growths above the recto sigmoid juncture. Etiologically, there is only one condition from which we know that cancer may develop. Adenomas of the rectum frequently degenerate into carcinoma. Chronic irritation may, in some cases, play a part; at least we occasionally see a carcinoma developing in a diverticulitis or other inflammatory condition.

Contrary to popular belief among the laity, hemorrhoids probably play a small part in the causation of carcinoma, as only five per cent of the rectal cancers occur in the hemorrhoidal area. It is conceivable that in this five per cent, chronic irritation, due to the hemorrhoids, may play a part in the development of malignancy. The remaining ninety-five per cent occur well above the hemorrhoidal area and, therefore, can have no connection with the hemorrhoids.

At the present time the most neglected phase of rectal cancer is the question of diagnosis. Usually this is not made until late in the disease. In fact, so late that not more than forty or fifty

\*Read before the Cass County Medical Society, Fargo, N. D., January 29, 1931.

per cent of the patients presenting themselves are suitable for radical operation. This situation is due to several causes. First, the public does not realize that rectal cancer is almost symptomless in the early stages of the disease, and secondly, physicians do not make enough rectal examinations.

The text book picture of cancer of the rectum is usually given as the passage of blood and mucus, morning diarrhea, increasing constipation, alternating diarrhea and constipation, pain, anemia, and gradual loss of weight and strength. It would have been far better if this description had never been written. These are the symptoms of far advanced carcinoma, and if one waits until this picture presents itself, the prognosis is invariably hopeless. In some cases there are no symptoms whatever in the early stages of cancer of the rectum. This is unfortunate, but must be accepted as a fact and is simply a hazard all must face.

The only symptoms ever encountered in early carcinoma are the passage of a little blood or mucus. This is unfortunate for a large percentage of our population have at one time or another, or do occasionally, pass a little blood or mucus. No serious results having ensued, many come to regard this symptom with indifference, or at least without alarm. Not until more pronounced symptoms appear do they seek the physician's advice. Laity and physicians alike

should thoroughly realize that the passage of blood and mucus is a danger signal, and not a diagnostic sign. In every case these symptoms should be the occasion for a careful rectal examination. Rectal carcinoma cannot be diagnosed or ruled out from symptoms. Examination is the only method of any real value, and it is only by actual examination that we can hope to discover cancer in its early stages.

Examination should be done in a routine fashion. Digital examinations should be made first. At least seventy-five per cent of all rectal carcinomas may be found upon digital examination. To the touch they usually appear as a flat, hard, button-like nodule in the mucosa, as a cauliflower mass, or a stricture-like area. When such a condition is felt, it should be assumed to be malignant until proved benign. Such an area may be an inflammatory process or a benign tumor, but the burden of the proof rests upon the physician. Proctoscopic examination should never be omitted. Actually seeing the lesion in question is the most reliable method of making a diagnosis. When they are situated beyond the reach of the finger, the only way small lesions may be found is with the aid of the proctoscope. In the case of fairly large or advanced lesions the X-ray reveals a defect. Even then the nature of the lesion is sometimes not apparent. In case of early carcinoma of the rectum, the X-ray is of little, if any, value.

As seen through the proctoscope, carcinoma of the rectum may present several different pictures. In one type, it appears in early stages as a small, flat button-like elevation in the mucosa, the edges of which are reddened and raised a little higher than the center of the lesion. The smallest one of this type which I have seen was one and one-half centimeter in diameter. There were no symptoms indicating the presence of the growth; it was discovered in the course of a routine examination. This growth was so small that no ulceration was present but as this type of growth increases in size, ulceration occurs near the center. It is at this point that the symptoms of blood and mucus appear. As the growth enlarges, it extends somewhat like a rodent ulcer, until it finally encircles the bowel showing a large area of ulceration and contracting the bowel but never presenting a cauliflower appearance.

The second type of carcinoma is the cauliflower type. These probably develop in most cases from a polypoid adenoma. If seen early, they appear as a cauliflower-like mass protruding with the rectal lumen and attached to the rectal wall by

a stalk, or pedicle, of varying size. The surface is usually ulcerated, friable, and bleeds easily. The extension of these growths is usually by a down-growth through pedicle into the bowel wall, or by direct attachment of the distal portion of the growth to other points on the bowel wall. In any event, the late picture is a cauliflower-like mass involving a large portion of the rectum and partially or completely closing off its lumen. The third type is seldom seen in the rectum, but usually higher in the large bowel. This is the small signet ring or scirrhous type of carcinoma which encircles the bowel and produces a stricture, but reveals a very small tumor mass. This type is frequently symptomless until obstructive symptoms occur.

The chief conditions from which carcinoma must be differentiated are hyperplastic tuberculosis, syphilis, benign adenoma, inflammatory masses due to diverticulæ, actinomycosis, or other causes. It is impossible for even the most experienced always to differentiate between these conditions. It is well to remember, however, that carcinoma is common, while the other conditions mentioned are relatively rare. The large majority of lesions which feel and appear to be carcinomas, are carcinomas. Certain connective tissue tumors or extra rectal tumors sometimes protrude into the lumen of the rectum. A point of differentiation is that the rectal mucosa over these masses is normal in appearance, unless there is ulceration secondary to trauma, or the rectal wall has been completely broken through by the tumor mass. A tumor entirely covered by normal epithelium is not carcinoma.

If there is reasonable doubt in these cases a biopsy may be done. If biopsy is done, a large specimen should be removed so that a piece of the actual tumor is taken. Too often, in the case of a small specimen the removed tissue shows only an inflammatory condition or proves to be a pedunculated tab of normal epithelium which was located at the margin of the growth. An improper biopsy only adds to the physician's confusion. While all do not agree, I feel that biopsy should not be done unless absolutely necessary. To me, cutting into a cancer with the idea of later operation is not good surgery. If biopsy is done, it should be done with the actual cautery, a frozen section should be made, and the surgeon should then proceed with the radical operation at once if the report is that of malignancy.

The prognosis in a given case of rectal cancer is very uncertain. It depends upon many factors:

the age of the patient, the type of growth—whether the adjacent organs are invaded—and the presence or absence of metastasis. Often these factors cannot be determined before operation. Frequently the abdomen may be full of metastatic nodules which cannot be demonstrated until the abdomen cavity is explored. When the tumor is adhered to the adjacent organs, the fixation may be due to inflammation and not to tumor invasion. A small tumor may have many metastasis and a large one, none. The type of tumor cannot be determined without microscopic examination. Thus, every case must be judged upon its own findings.

In general it may be said, as with a cancer elsewhere, the younger the patient, the more unfavorable the prognosis. Some English writers go so far as to say that in persons under thirty, cancer of the rectum is always fatal. Cancer may occur at any age. The youngest person I have seen with cancer was sixteen years old, though there are younger cases reported in the literature. The average age is about fifty. Some patients with a slow-growing tumor may live several years after colostomy alone, the tumor itself not being operated. I had one patient seventy-four years old upon whom radical operation was considered inadvisable because of his general physical condition. A simple colostomy was done, and he lived for five years, and was apparently in good health and spirits until a few months before his death. Other cases with no apparent metastasis at time of operation, in spite of most radical procedure, go on rapidly to fatal termination.

Confronted, then, with a case of rectal carcinoma, what is best to be done? The question to be decided is: what procedure will give the most years of comfort and life to this particular individual? There is certainly no glory in executing some brilliant and highly technical operative procedure and have the patient die as the result of it. There is no condition to which the threadbare axiom that "the operation should be fitted to the patient, rather than the patient to the operation," may be applied with greater truth than in the case of carcinoma of the rectum.

In dealing with carcinoma of the rectum the surgeon should have in mind at least five possible procedures. Considered from the point of view of being the "perfect operation," and the radical removal of the largest amount of tissue, they are in order named: (1) One-stage abdomino-perineal, (2) Two-stage abdomino-perineal, (3) Colostomy, followed by perineal resection of

the rectum, (4) Perineal resection alone, (5) Colostomy.

Regardless of the operation which may be the ideal one in theory, the operation selected must be the one, which, in the opinion of the surgeon, offers the most to that particular patient. In deciding what may be best for a certain patient, a number of factors must be taken into consideration. (1) The general condition of the patient. Many of these patients are old, with constitutional defects which will not permit of the most radical procedure. (2) The location of the growth and whether or not it is fixed or has invaded adjacent structures. Even if fixation is present, in some cases it may be due to inflammation. (3) Whether metastases have occurred. Except in advanced cases, this cannot be determined until the abdominal cavity is opened. The only lymphatics readily palpated are those in the inguinal region and these are involved only in those cases occurring in the anus or at the upper margin of the anal canal.

It is felt by some surgeons that, even though metastasis has occurred, if it is not too extensive the patient may be made more comfortable and his life prolonged by the removal of the primary growth. I cannot whole-heartedly subscribe to this theory. When the increased operative mortality of a radical removal over a simple colostomy is considered, as well as the ordeal which the patient must go through in having the radical operation, I do not believe the game is worth the candle. I do not believe the sum total of the patient's pain is decreased, nor is his life much prolonged. In other words, if there are metastasis involving anything more than the lymphatics most adjacent to the rectum, I think a simple colostomy is the procedure which usually serves the patient best. It would certainly be the procedure I should want done upon myself.

Of the operations considered, the one-stage abdomino-perineal is the most radical and complete. It is also applicable to only a relatively small group of patients and carries an operative mortality of from ten to thirty-five per cent. I believe that the latter figure is more nearly correct in the hands of the average surgeon. With careful selection of cases in the hands of an expert, ten per cent may be a fair figure. It is obvious that for patients in poor physical condition, this is not the operation of choice, nor do I feel that it is usually indicated in obese patients.

The two or three-stage abdomino-perineal method is the second theoretical method of choice. Again it is a question of how much the patient

can stand. If obstruction is present, it should be done in three stages. That is, preliminary decompression of the colon by a colostomy or cecostomy. Secondly, the abdominal portion of the operation is done, and later the operation for the removal of the lower segment of the extra peritonealized portion of the rectum and tumor itself. I prefer this type of operation in those cases where the growth is just at the peritoneal reflection of the pelvic floor, or perhaps extends upward slightly into the abdomen. It is difficult to get a wide margin about a tumor in this location when trying to remove it by simple perineal resection.

The third method is that of simple colostomy followed by perineal resection of the rectum at a later date. From the point of view of mortality, this is the ideal procedure. In the case of a debilitated patient, it permits of a simple operation (colostomy) after which the patient may build up to withstand the more severe secondary operation of the posterior resection of the rectum. It is true that not so wide a margin of tissue can be removed by this method, and that for high-lying growths, adequate removal is difficult, if not impossible. How much advantage is gained by the removal of a larger amount of tissue by the two preceding methods is a matter of controversy. In rectal cancer, Miles represents the one-stage abdomino-perineal school; Mummery, the colostomy and posterior resection group. Mummery sizes up the situation in one of his articles as follows: "All that the abdomino-perineal method offers over perineal resection is the removal of a little more of the pelvic peritoneum and lymph nodes of the pelvic mesocolon. Further, if a single gland outside the rectum is involved macroscopically, recurrence is almost certain, regardless of the type of procedure."

In cancer of the lip it has been shown that, without glandular involvement, the percentage of cures is high, but if a single gland is involved, even though ablation of all the gland area possible is done, the mortality reaches almost eighty per cent. The Wertheim operation for cancer of the cervix had its day. It was extremely radical removal: with high mortality, and after years went by, it was shown that the recurrence was about the same as with less radical removal.

I merely cite these facts and opinions that we

not be carried away with the idea that the most radical operation is always the best for the patient. I personally feel that colostomy and perineal resection has a very important place in dealing with rectal carcinomas. Recurrences may be a little more frequent, but fewer patients will be killed by operation.

The fourth procedure is perineal resection alone. This should be reserved for cases where the carcinoma is small and well below the peritoneal reflection. Where there is any doubt, more radical procedure should be employed if the patient's condition will permit.

The fifth procedure; colostomy alone, is reserved for those cases whose physical condition will not permit radical procedure, where local removal of the growth is impossible, or extensive metastasis are present. The relief of obstruction and short circuiting the fecal current may give the patient months, and even years of comfort.

In closing I wish to leave but two thoughts with you; the first as to symptoms and diagnosis. The passage of blood or mucus is a danger signal, and is a symptom which may mean any of a dozen rectal conditions. When they appear, rectal examination is indicated. The only sure way of making a diagnosis of early malignancy of the rectum is by digital and proctoscopic examination. The textpicture of cancer of the rectum should be forgotten—it is twenty-five years behind the advance of the rest of medicine. Second, there is no one satisfactory routine operation for cancer of the rectum. A surgeon should know at least five procedures. When in doubt as to what procedure to employ, it is likely better to choose the more simple method.

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## Routine Methods in the Diagnosis of Tuberculosis\*

SAM H. SNIDER, M.D.

*Kansas City, Mo.*

A GENERATION ago the diagnosis of tuberculosis was usually made late in the course of the disease and connoted a serious prognosis and an early death. This caused the diagnosis to be feared by both physician and patient, and much of this fear remains in the mind of the medical profession and the laity. This fear is not shared by men who are doing extensive work in diseases of the chest, for the methods that have developed in the last few years have enabled us to recognize tuberculosis in the early stage of its clinical manifestations, and in some cases, before the patient is aware that he is the victim of a serious ailment. This diagnosis, made earlier in the anatomical and physiological advancement of the disease, implies a much better prognosis than before and the laity is becoming educated to the fact that this diagnosis does not have such a serious significance.

New methods of diagnosis are of great importance in the study of tuberculosis, but no amount of technical skill and laboratory equipment can ever replace the keen clinical sense which is the first essential to good diagnostic work. This clinical sense is gained only through extensive experience in diseases of the chest, including a thorough knowledge of juvenile tuberculosis.

*Juvenile Tuberculosis*—Tuberculous infection is quite common in the early years of childhood. Statistics present a varied picture of the prevalence of tuberculosis in childhood, but it may be safely said that in the average urban community, about forty per cent of children have been infected with tubercle bacilli. This infection is not a true pulmonary tuberculosis, but is usually confined to the lymphatic tissues of the hilum, the peribronchial regions, the mediastinum, and the mesenteric and retro-peritoneal lymphatic glands. It may not be accompanied by any clinical symptoms whatever, and if symptoms are present they are not often startling nor conspicuous. The child may be undernourished and puny, or, on the other hand, may be the picture of health. Cough and expectoration are exceptional in these cases. The disease is rarely manifested by physical signs, other than

slight afternoon fever, and the diagnosis can usually be made only by means of tuberculin test and X-ray examination; the latter showing enlarged glands in the hilus regions with infiltration extending along the upper bronchial tree toward the periphery. In such cases the immediate prognosis is good; the only serious results which are commonly met being tuberculous meningitis and tuberculous peritonitis. The disease may persist for years and become manifest by further invasion after adolescence. The causes of this further invasion after adolescence are not altogether clear, but the endocrin and humoral changes which occur at adolescence probably are a factor in causing the further invasion. To these may be added the strain of economic competition, of dissipation, worry, over-exertion, loss of sleep, and all the unfavorable factors which accompany modern life.

The relation between juvenile and adult manifestations of tuberculosis is not altogether clear and there are two distinct schools of opinion concerning this relation. Dr. E. L. Opie and his associates of the University of Pennsylvania, maintain that tuberculosis in adult life is usually a manifestation of re-infection occurring after adolescence; while another group of men believes that re-infection after adolescence is not common and that the tuberculosis of adult life is a direct sequel to childhood infection, being either a direct continuation of active infection or a recrudescence due to the changed condition of the body and of life. There has been much writing and discussion on this debated question and the solution is not yet at hand. If re-infection is necessary to the production of the adult type of tuberculosis, childhood infection, conferring a certain degree of immunity, would seem to be a desired event. On the other hand, if adult tuberculosis is the direct result of childhood infection it behooves us to spare our children the exposure to adults with tuberculosis as far as we can possibly do so. The last word on this subject is unsaid.

*History*—In discussing the history of tuberculosis we shall divide the disease into two general types; first, that of insidious onset and slow progress, usually due to lymphatic dissem-

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ination of the disease; and second, the sudden breakdown with a tuberculous pneumonia, which is usually due to the rupture of a caseated area into the bronchus, causing hemorrhage or the extrusion of a large quantity of infectious material into a bronchus leading to massive atelectasis and tuberculous pneumonia. In the insidious type of onset it is necessary to obtain a careful history to get a true picture of the disease. The physician should begin with the question: "When did you first have poor health?" If the question as to onset is framed in this way, the patient will often date his illness much earlier than if asked, "How long have you been sick?" The common manifestations which excite a suspicion that tuberculosis may be present, may be divided into a triad, as follows: Cough and expectoration, fever and tachycardia, and loss of weight and strength.

If a patient has this triad of symptoms for a period of two or three months or more, the diagnosis is tuberculosis until the clinician has shown some other condition to be the cause of the disability. Cough is often present without expectoration and has the same significance as if expectoration were present. It is an almost constant symptom of active pulmonary tuberculosis. Fever and tachycardia may not be apparent to the patient and should always be sought by taking the temperature and pulse at three or four hour intervals throughout the day for several days. While the presence of persistent afternoon fever and tachycardia always excite a suspicion of pulmonary tuberculosis, their absence cannot be taken as evidence that the disease is not present. Any elevation above 98.6 degrees should, for diagnostic purposes, be regarded as fever, excluding slight elevation of temperature during the pre-menstrual period. The phrase "loss of weight" is used to designate a loss of five per cent or more of normal body weight within a period of three months or less while a loss of strength becomes manifest on moderate exertion.

Other symptoms which are frequently met and have much the same significance as the above triad, are fatigability or inability to endure ordinary exertion without undue tiring, dyspnoea on exertion, which is encountered as constantly in tuberculosis as in heart disease, hemoptysis, which we define as the expectoration of a teaspoonful or more of bright red blood, followed for some hours or days by the expectoration of blood-streaked sputum. This symptom is fairly common in tuberculosis and seldom met with in any other condition save bronchiectasis, and this is not very common. Any patient who has a

definite hemoptysis should be regarded as tuberculous even in the face of negative physical findings, and as potentially tuberculous even though both physical and X-ray findings in the chest are negative. A patient who has had a definite hemoptysis should be kept under observation for a period of months or even years to be sure that he does not develop an active pulmonary tuberculosis. I have seen several patients who have hemoptysis in whom tuberculosis could not be demonstrated, by physical examination or X-ray, but who later developed clinically manifest tuberculosis. This will be readily understood when we consider that the hemoptysis may come from a minute diseased area rupturing into a bronchial tube and this disease may be remote from the stethoscope, and too small to be demonstrated by the X-ray findings.

It has not been long since it was widely believed that asthmatics did not have tuberculosis, and that tuberculous patients did not suffer from asthma. I am convinced that this belief was erroneous, for I have seen numerous patients whose chief complaint was perennial asthma, who had a clinically demonstrable tuberculosis. This tuberculosis is usually manifested by little or no toxemia and only slight anatomical invasion, but careful study of the history accompanied by X-ray examination, tuberculin test where indicated, and temperature charts, will show that quite a large proportion of the sufferers from perennial asthma have a tuberculous infection. In a few cases the infection is accompanied by definite toxemia.

Loss of appetite is a very common symptom in tuberculosis, although not always present. It may be due to toxic or reflex disturbances of gastric secretion or to intestinal tuberculosis, and is a large factor in the production of loss of weight that is so common in this disease.

*Pleurisy*—Many people complain of "pleurisy" when the pain may be due to other causes. If a genuine pleurisy is present and is manifested by chronic pain in the lateral portion of the chest and a friction rub, the chances are very great that tuberculous infection is present. Careful investigations will show that two-thirds of the proven dry pleurisies are caused by tuberculous infection. Pleurisy with effusion, although not so common as dry pleurisy, is so frequently due to tuberculosis that every pleural effusion whose etiology cannot be shown to be something else, should be regarded as due to tuberculosis. Sir William Osler was one of the first to study the relation of pleurisy with effusion to tuberculosis

and his estimate that 90% of the pleurisies with effusion were due to tuberculosis is now known to be quite conservative. If pleurisy with effusion occurs and some cause other than tuberculosis cannot be demonstrated, the physician should tell the patient he has tuberculous infection, for by thus putting him on his guard we may initiate an alertness and a mode of living that will insure longer life to the patient.

*Spontaneous Pneumothorax*—Spontaneous pneumothorax is not a common occurrence, and not always due to tuberculosis, but any patient who has spontaneous pneumothorax should be carefully studied by means of history, physical examination, and X-ray to determine if he has tuberculosis. It is not sufficient to make a plate while the lung is compressed by the pneumothorax, for then the disease may be hidden in the compressed lung. Serial plates should be made while the lung is re-expanding and if evidence of tuberculosis is discovered, the pneumothorax should be continued by artificial means, for re-expansion of a compressed lung usually is followed by adhesions which would prevent subsequent compression.

*Sudden Onset*—The patient may have a sudden breakdown with pneumonia and in such case a diagnosis may not be clear for quite a while after the acute stage in the pneumonia has passed. I am of the opinion that most of the cases of tuberculous pneumonia are due to plugging of the bronchus with blood or caseous material which is infected with tubercle bacilli. This plugging produces a massive atelectasis which is followed by infection of the atelectatic area. The onset and clinical symptoms in such a case may closely resemble those of lobar pneumonia. The disease however, does not often terminate by crisis and recovery is usually tedious. I am of the opinion that most of the so-called chronic pneumonias are tuberculous, and any case which has a tedious recovery should be carefully studied by history, physical findings, serial X-ray plates, and sputum examination, to determine if tuberculosis is the cause of the disease.

*Physical Examination*—The physical examination should not be confined to the chest, but should include notes as to the color and nutrition, and should search for evidence of other disease which might explain the symptoms. Too much concentration on the question of whether tuberculosis is present may cause the clinician to overlook disease of other organs such as thyrotoxicosis, gastric carcinoma, pernicious anemia, leukemia, endocarditis, etc. Having excluded other causes

for the symptoms, we proceed to the examination of the chest, noting first any changes in muscle tension and nutrition by careful comparison of the two sides of the chest, the shoulders, and the neck, when the patient is sitting comfortably in a suitable light. The inspection includes examination and comparison of the expansion on the two sides. This inspection should also include a note as to the color of the skin, particularly over the cheek bones, as a flushing of one cheek may be evidence of irritation in the corresponding lung.

*Palpation*—Muscle changes are also studied by careful palpation—a method widely advocated by Dr. F. M. Pottenger of Monrovia. The examination by palpation should also include a study of the tactile fremitus, carefully comparing the vibration of the two sides of the chest, one hand being placed on the back and the other on the front of the chest.

*Percussion*—We then proceed to the examination by percussion, a method which has long been in vogue, and one which may be very disappointing in its failure to discover evidence of disease. The absence of abnormal findings on percussion cannot be interpreted as any evidence that disease is not present, while definite dullness is usually evidence of marked structural changes. If a patient has a chronic toxemia accompanied by dullness in the upper chest, he is almost certainly tuberculous, while toxemia accompanied by dullness in the lower chest cannot be interpreted as evidence of tuberculosis unless tubercle bacilli are found in the sputum or a pleural effusion is present.

*Auscultation*—Auscultation by means of the stethoscope is the method par excellence for demonstration of physical signs of tuberculosis, but it may not be supposed that every case of tuberculosis can be discovered by the stethoscope. In fact, many cases will be discovered by other means, particularly the X-ray, whose examination by palpation, percussion and auscultation is entirely normal. Hence, the absence of rales cannot be taken as evidence that no disease is present, but the presence of crackling rales in the upper chest accompanied by a chronic toxemia is acceptable proof of pulmonary tuberculosis. Rales confined to the lower chest should not be regarded as due to tuberculosis unless the sputum is positive for tubercle bacilli. This rule should not be followed too literally, for I have seen fifteen cases of tuberculosis confined to the lower half of the chest as proven by positive sputum, without any evidence whatsoever of disease in the

upper chest. Bronchial rales signify merely that the bronchi are more or less filled with secretions, and these findings have no significance in demonstration of the presence or absence of tuberculous infection. It must be remembered that a tuberculous infection in the lungs may set up reflex irritation of the bronchial tubes and result in over-secretion and bronchorrhea which may mask a true pulmonary tuberculosis under the guise of a chronic bronchitis or bronchiectasis.

**Temperature and Pulse**—No study of the physical findings is complete without a study of the temperature curve. It is better not to have the patient in bed for this study, for many patients run a fever while ambulatory, only to have the temperature drop promptly to normal on going to bed. It is our custom to obtain readings of the temperature and pulse at eight, twelve, four and eight for four or five days.

**Laboratory Methods**—The laboratory has given very valuable aid in the diagnosis of tuberculosis. Shortly after Koch's discovery of the tubercle bacillus it was believed that an examination of sputum for tubercle bacilli was the key to the diagnosis. This belief was erroneous, although it must be admitted that sputum examination was one of the best methods of diagnosis at that time. We now know that many cases of tuberculosis are found which do not have bacilli in the sputum in sufficient numbers to be discovered, and if we rely on sputum examination for diagnosis in such cases, the diagnosis will be missed or delayed. Tubercle bacilli can reach the sputum in great numbers only if there is an ulceration somewhere along the respiratory tract. Since this does not occur in nearly all the cases, the sputum will be negative in many cases where the disease exists to a considerable extent. However, I would not belittle the importance of sputum examination in differential diagnosis, for it is here that the examination of sputum has the greatest value. In a case of suspected lower lobe tuberculosis, sputum examination for tubercle bacilli is extremely important. Likewise, it may well be used to differentiate pulmonary abscess from tuberculosis. So it may be seen that although somewhat restricted in its usefulness, the sputum examination for tubercle bacilli still has great value.

A leukocyte count may be of considerable value in the differential diagnosis for the mild tuberculosis without cavitation is usually accompanied by a normal leukocyte count, but in later cases with cavitation leukocytosis is quite often present.

**Tuberculin Test**—The tuberculin test does not have the same value in the diagnosis of tuberculosis of adults that it has in the tuberculosis of children. This is due to the fact that many adults have been sensitized to tuberculin by infection with tubercle bacilli and many carry their sensitization long after the infection has ceased to be of any clinical significance. But it seems to me that I have been able to obtain some valuable information in cases where tuberculosis was suspected, but not definitely proven, by doing a tuberculin test. This is particularly true in the cases of bronchitis, asthma, and other obscure manifestations of tuberculosis. I use the Mantoux test and do not regard the Mantoux test in adults of great significance unless it is strongly positive, but I do regard a strongly positive test as evidence of recent infection.

**X-ray**—Many discussions both pro and con have been written concerning the use of the X-ray in the diagnosis of tuberculosis. This division of opinion is due largely to a failure of the clinician and the radiologist to get together and discuss their problems. The radiologist has had a marked tendency to be over-enthusiastic concerning the amount of information he is able to impart to the clinician, and the clinician, having all the other facts in the case at his command, often finds the radiologist to be trespassing into the field of the clinician. No one who has had a large experience in diseases of the chest would presume to do diagnostic chest examinations without the aid of the X-ray, for by means of the X-ray many infiltrations are discovered which would otherwise be overlooked and my experience leads me to estimate that the X-ray will show cavities in more than three times as many cases as will physical examination.

In interpreting X-ray plates it must be remembered that infiltrations in the upper half of the chest accompanied by chronic toxemia are usually tuberculous, while infiltrations confined to the lower half of the chest are usually non-tuberculous. All together, the X-ray is the most valuable single method of examination, and its use should never be neglected nor its value belittled.

**Demonstration of Activity**—Having studied the patient carefully by means of history, physical findings, X-ray, and laboratory examination: having determined that he has tuberculous infection, the next problem is to determine whether this infection is progressing, active, and a menace to the health of the patient. Serial X-ray plates are valuable in this connection for by comparison

of plates made at intervals of several weeks or months, it is possible to determine whether a lesion is spreading or being absorbed. The study of a single X-ray plate or of stereoscopic plates may be used as the basis of an opinion as to whether a lesion is active or inactive. The flocculent, cottony densities may be interpreted as evidence of activity, but this interpretation must be accepted very cautiously and will often be incorrect. Sharply defined calcifications are evidence of healing, but it must be remembered that the lesion may be progressing in one area and healing in another. The best method of seeking activity is the study of symptoms, for the term activity denotes that symptoms are present and nothing more. In other words, after we have discovered the disease to be present we interpret it as being active in case the patient has evidence of physiological disturbances arising from the absorption of poisons at the site of his disease. It must

be remembered that a patient may have a well-healed, pulmonary lesion accompanied by caseated glands in the hilus and that these glands may cause fever to persist after the pulmonary lesion has healed. Such cases are usually fairly safe unless a caseated gland ruptures into a bronchus and produces a bronchogenic dissemination of the disease. When the diagnosis is made it is our custom to classify the case according to the National Tuberculosis Association classification, stating first the nature and extent of the anatomical changes, then the severity of the physiological manifestations.

In conclusion I wish to pay tribute to the excellent work being done in the state of Minnesota, by the various men who are struggling with the tuberculosis problem here. They have the situation well in hand and further decrease of morbidity and mortality from tuberculosis may be anticipated.

## Medical Progress and the General Practitioner

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*Britton, S. D.*

THE spirit of change which at present pervades every department of human affairs has not been without its effects on the practice of medicine.

Medical Science has kept well abreast of the general advance, and medical research has laid much new and valuable knowledge at the feet of the general practitioner for use in his art, but still he is not happy because he has economic troubles that medical science cannot ameliorate.

As the health of the profession depends, not on the lofty ideals or achievements of medical science, but on the economic welfare, the comfort and prosperity of its individual members, it may not be amiss to consider some of the things that the practitioner has to contend with in his efforts to make a living.

The changes in medical practice during the last few decades have been great and many, but they have not been fundamental. This is due to a certain continuity that underlies medical practice from generation to generation. We still deal with the same whimsical public. We still deal with unchangeable human nature, and we still stand at the bedside of the patient. These changes have been of an economic nature and while not fundamental, are, nevertheless, very serious and important.

The old country doctor has passed from the stage forever. His environment underwent evolution. It is a law in natural history that when the environment undergoes evolution, the species migrate. So this is what happened to the old country doctor—he lost his background—bad roads and horses gave way to good roads and automobiles and the old country doctor migrated in search of food.

The old country doctor treated his own patients in their own homes by his own skill, thereby becoming responsible, self reliant and resourceful. The old doctor whose art was only half a science, had to assume more responsibility with less knowledge—with results that were surprisingly good. Many of the methods employed by the old doctor would not now be thought skillful, but he followed the beaten paths of the medicine of his time and did not try to exceed his limitations.

He was not without ambition. He was a dreamer and lived in hopes of being a great man some day, but domestic cares and economic stress chained his ambitions and he never got anywhere. Very few of the old general practitioners ever rose conspicuously above their fellows. Theirs was a local fame at best. It was among the old country doctors who derived but a scant sus-

tenance from their practices and who had not the smallest chance of attaining professional honors, that the professional spirit was strongest.

The very consciousness that there was nothing in the old doctor's worldly circumstances to distinguish him from the people among whom he practiced led him to hold high the dignity of his profession and to take a pride in his calling, which was his single title to distinction. The new doctor speeds his patient over the good roads to a hospital where he can have the advantage of teamwork from various specialists.

The doctor of the last generation is a different type of man from the doctor of today. If a composite picture were made of each and compared we would expect the face of the old doctor to show more of leadership and less of learning than the new doctor. The new doctor has the stamp of learning on his face from his longer sojourn in scholastic halls; the student's curiosity and thoughtfulness are his. The old doctor learned more from his contacts with men and became sagacious. Both faces are intellectual and bear that look of harassed calmness, the hallmark of the M.D. in every clime, especially when in active pursuit of his calling. The old is weather-beaten and strong in body—an open air man. The new is athletic and strong, suggestive of the golf links and gymnasium. He is a dreamer as all young doctors are, and we hope that his dreams will come true. But he has not the perspective to realize that there is no definite line of promotion in the medical profession along which one can advance.

Any invention that abridges distance is going to have an effect on the distribution of the population. Many of the small towns are being deserted. Twenty-five or thirty years ago these towns had one or two resident physicians. These left with many of the business men because they could not make a living. The small town doctor has lost his importance in the community. The people have contempt for him and would not patronize him anyway. Moreover, the country is being sown with hospitals to which the patients with money are at once removed.

The cry of the dearth of doctors in the rural districts has gone up and is being echoed in the high places of the profession. Many of our leading men write articles on the subject, but it is difficult for them to see it in a clear light. They even suggest turning out a superficially trained man to remain in these deserted villages.

The facts are that between the telephone in every home, the good roads and the automobile,

the people who live in the rural districts are receiving more prompt and efficient medical service than they ever did before.

There can be little doubt that the interference of the public in medical affairs has had a pernicious effect on the practice of medicine. There are certain groups of men and women who compose a sort of self-appointed auxiliary to the medical profession. They are responsible to no constituted authority. They go around saying that they are doing good—they have the faculty of creating jobs for themselves at good remuneration—they claim to be easing the burden of the busy physician, and it is true that between their free dispensaries and clinics, the busy physician is not so busy. These people invest their work with a certain sanctity, for the purpose of discouraging investigation of their activities for sham and imitation, and especially to find out what salaries they receive. The real doctor does not sanctify his calling. Only mediocrity takes itself seriously, and only the grafter talks about doing the "Master's work."

The doctors are largely to blame for this condition as they aided and abetted it themselves. These numerous organizations, many of them organized for gain, are barnacles that slow up the progress of the medical profession economically.

Between these groups and the cults who manage to skim a good deal of the cream from medical practice, the practitioner comes near to losing his birthright. The banner of Chiropractic still waves over a wild-eyed mob that we are unable to disperse; we should show these imposters no quarter and should wage ruthless but intelligent warfare on them, on the principle that they are frauds and that a fraud has no rights. Instead of that we compromise with them. We even allow some of the "cultists" to enter the regular profession if they can pass some kind of examination or other, instead of firmly insisting that everyone who enters our profession must do so through the regular channels.

The expansion of medical knowledge begets specialties, and while it is true that human life is not long enough for us to master any but a small part of medical knowledge, still it seems possible that we may sub-divide this knowledge too much, so that we can lose the perspective of a comprehensive whole. It is the preservation of this perspective that makes the general practitioner the most useful agent in applying medical knowledge to a practical purpose.

With this broad perspective and a wide contact with the people, the general practitioner represents in his art the most practical and workable

method of bringing the benefits of science to the afflicted. His versatility should broaden his field of usefulness to a greater extent than that of the average specialist. He should be familiar with the fundamentals and general principles underlying the different specialties. Each and every specialty should leave a part of its field open to the general practitioner, where he may practice his art to the extent of his knowledge. Even proud surgery sets aside a generous portion of its domain as "the legitimate field of the general practitioner." The general practitioner with his broad foundation, should be a specialist himself in such things as physical diagnosis and other essentials of practice.

The overwhelming majority of cases do not require any deep scientific investigation. If they did, we would be unable to accomplish much. If we followed every scientific inquiry through its various ramifications, many of our patients would be dead before we got finished and some of them would have died of old age. A certain number of cases to be sure, must be set aside for further investigation.

This does not mean that we should not use every diagnostic resource—nor is it an attempt to belittle the valuable scientific knowledge that we have recently acquired. It simply means that the practice of medicine is more workable and effective if not hampered by too much scientific impedimenta.

If a railroad engineer should observe every jot and tittle of the rules in taking his train over the division, he would be discharged at the end of the run for not making time. Nor should we forget the old beaten paths of practice. Most of them lead at least in the general direction of the patient's recovery.

The people are our customers, and as such should be treated with consideration. We cannot impress them with our learning, but it is up to us to get along with them. They don't have to get along with us.

The mass intelligence is very low. This is a good thing for civilization. It gives the masses inertia; it lets much dangerous revolutionary propaganda go over their heads—along with our educational propaganda. They lack initiative and must have leaders. We should think of these solid facts before we begin educating the people. The people are credulous; that is why the cults and other imposters flourish.

The public dimly perceives that the medical profession is essential to their welfare. They are aware of our importance, but as we practice our profession for gain, they are slow to grant

us special privileges. They think that we should take care of ourselves and escape our enemies by our own devices.

The medical profession is not as venal as the people think it is. It is by far the most self-sacrificing of any of the professions. It is altruistic to the point of weakness, but when a practitioner is harassed and annoyed by economic troubles, he is liable to forget our high traditions and bow his head to economic necessity.

So lost are we in amazement at the development of medical science in the last few decades that we fail to see its limitations or the place where it turns back on itself.

The unfit are surviving and, therefore, the race must be degenerating. Optimists point to the fact that the death rate is falling and that that is proof that we are more healthy. The majority of the people we see on the street are obviously of better physique than they were thirty or fifty years ago. If we take a walk through the park on any bright Sunday afternoon and see apparently happy and healthy thousands on every hand, we are apt to think that this talk about degeneracy is all nonsense. Education, sanitation, sports and the extension of the health service have done this, we are told.

But these are only surface phenomena and have to do with environment. We do not see the hundreds of thousands of defectives hidden away in institutions and poor homes, the result of heredity. If we could see these huge buildings covering acre after acre and devoted to the care of imbeciles, madmen, idiots and other defectives, both mental and physical—if we could see all of these buildings together and stretching away to the horizon in every direction, we would be stricken dumb with horror.

Yet only a fraction of those suffering from mental and physical defects are under institutional care—the rest are breeding freely day by day in every part of the globe. Even the figures in regard to so-called normal people are startling in what they reveal as to hereditary tendencies.

Only a soothsayer can see into the future, yet in foretelling the fortune of the general practitioner, we tell him that we think that he will have to come back, as he is the only one who knows how to treat the patient as an individual. He preserves the personal element and establishes a bond of confidence between the people and the profession.

Pure science, like pure gold, cannot pass current without an alloy—and the alloy in our case must be a concession to the weaknesses and inconsistencies of human nature.

## Tuberculosis Screens for the Clinician\*

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**I**N BIBLICAL times the sorting of the wheat from the chaff was done by hand. This hand process was in use until the advent of the Industrial Revolution. Then because the machine necessitated a greater production at a greater rate of speed, screens were developed to sort into grades many different industrial products. These screens sort as accurately, perhaps more so, than the human hand did.

We may liken certain of our sorting procedures in medicine to the screens used in industry. For the purpose of screening out tuberculosis, varying grades of screens are in use. The coarse screens consist of the history of exposure, the laboratory examination, the physical examination, the symptoms of disease and the X-ray examination, while the fine screens are the tuberculin test and the post-mortem examination.

### COARSE SCREENS

The *history* of exposure to tuberculosis could become a fine screen, but unfortunately, because of the limitations of the human elements which are involved, we are compelled to place this in the coarse group. Often a patient states that there has been no history of exposure, when in reality there has been an open but unsuspected case of tuberculosis in the family for years. Again the patient states that there has been a history of exposure because a physician had made some indefinite diagnosis such as weak lungs or a spot on the lung, and the family immediately interpreted the statement as meaning that tuberculosis existed. When careful investigation is made, it is found that tuberculosis was never definitely diagnosed.

If sufficient time is given the study of history of exposure, and it is found that such exposure has actually existed, the number of contacts with tuberculous foci in the body is almost unbelievable. Some recent observations of University students by Dr. H. D. Lees have shown that 92 per cent of those students who have actually had tuberculosis in their families react positively to the tuberculin test. Opie and McPhedran have called attention to the fact that, if an open case of tuberculosis exists in a family over a considerable period of time, the bacilli spread to approximately

100 per cent of the members of the family. Therefore a screen which must be considered coarse as it is now used could be converted into one of the fine screens.

*Symptoms* of disease are very much worthwhile in arriving at a diagnosis. Not many years ago, workers in tuberculosis stated that in evaluating the accumulated data for the purpose of diagnosis, 50 per cent should be given to symptoms. Since that time some facts have come to light which have proved that symptoms constitute a rather coarse screen. There is not one symptom that is pathognomonic in tuberculosis. In other words, every symptom that occurs among patients suffering from this disease occurs among patients suffering from other diseases. Pleurisy with effusion and pulmonary hemorrhage have long been considered the two most valuable symptoms in diagnosis of tuberculosis. Of the two, pleurisy with effusion is the more valuable, but here one must take into consideration whether the effusion was accompanied by, or preceded by, acute respiratory disease, such as pneumonia.

One must also take into consideration numerous other conditions such as malignancies, rheumatic fever and cardio-renal disease. In other words, the mode of onset and the subsequent findings play a considerable role. Not so long ago, it was frequently stated that 95 per cent of the cases of pulmonary hemorrhage were suffering from pulmonary tuberculosis. To be sure, pulmonary hemorrhage leads one to suspect tuberculosis, but one must bear in mind the fact that patients suffering from bronchiectasis have hemorrhages almost twice as frequently as patients suffering from pulmonary tuberculosis. It has been estimated and studies have shown that hemorrhage occurs in approximately 30 to 35 per cent of patients suffering from pulmonary tuberculosis; therefore, if one waits for hemorrhage to appear, a vast number of patients will never have diagnoses of tuberculosis. Moreover, tuberculosis may exist in the body for months and even years before any symptoms appear.

*Body-weight* has been talked about a great deal as a tuberculosis screen. Formerly 10 or 15 per cent below the theoretical normal weight constituted a criterion for tuberculosis examinations of school children. Time has shown, however, for the theoretical height-weight tables are of

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little value so far as detection of tuberculosis is concerned. To be sure, if a tuberculous patient has become a consumptive, he is very much underweight. It is not at all uncommon to find clinical tuberculosis in the body of a person who is well above the theoretical normal weight. Such cases come to light rather frequently during the teen ages and early twenties. The physician who fails to apply all of the tuberculosis screens in cases in which body weights are equal to, or above, the theoretical normal will miss many a case of clinical tuberculosis. Symptoms, therefore, do not screen out cases of tuberculosis except in a coarse way.

*Physical signs* give us some information as to what has occurred in the past. At one time they were thought to be the most important phase of an examination. Perhaps they were at that time, but other diagnostic aids have come into existence, which, together with careful post-mortem observations, have shown that many tuberculous lesions escape detection by physical examination. It is a well-established fact that nearly all of the first infection, or childhood type, of lesions are not revealed by the physical examination. Careful observers have shown that as many as 8 to 12 per cent of patients suffering from the adult and destructive type of pulmonary tuberculosis present no abnormal physical signs. Tuberculosis of the mesenteric lymph nodes, solitary tubercles in the central nervous system, and many other extra-pulmonary lesions escape detection by physical examination.

Trudeau observed that some patients with no abnormal physical signs expectorated sputum which contained tubercle bacilli. He says, "I remember the first instance of this kind which occurred at Paul Smith's in the Summer of 1885. A young college student had come there while on his vacation to consult Dr. Loomis for a slight but persistent cough and some loss of weight and strength. Dr. Loomis was away in camp, and the young man asked me to prescribe for his cough. On examination of the chest I could find nothing positive, but I was so keen about my newly acquired knowledge in staining the tubercle bacillus that I subjected every patient who coughed to this test. To my astonishment I found the germ present in the expectoration, and told the patient he had tuberculosis and should not return to college in the Fall, but should go West and lead an outdoor life for a time. Naturally his family was much alarmed, for he was a big strong, young man and they had no idea there could be anything serious the matter with him. He awaited Dr. Loomis's return at Paul Smith's in order to get his opinion.

"Dr. Loomis, who, of course, attached no spe-

cial importance to the presence of the bacillus, examined him thoroughly. He could find nothing definite the matter with his lungs, and he said he could see no reason why the young man should not continue his college course, and so he went back to Harvard. Four months later one of my patients at Saranac Lake told me he had just heard that this young man had had a serious hemorrhage in the class-room, and had been sent at once to Colorado."

Trudeau's experience has become a very common one among physicians. Therefore, the physical examination must be classified as a coarse screen in tuberculosis.

*The laboratory examination* was looked upon as a fine tuberculosis screen soon after Koch discovered the tubercle bacillus. Trudeau did some very valuable work in diagnosis with the microscope. He says, "I had many opportunities to convince the unbelieving. Dr. D'Avignon had practiced medicine and surgery for many years at Ausable Forks, and was called upon all over the mountains in consultation and to operate. He was a shrewd, resourceful and skilful surgeon, and thoroughly interested in his profession.

"On one of his visits to Saranac Lake he called on me and found me in the little laboratory. He asked me about 'the germs,' in which he had as yet little faith; but he said, 'I will send you five numbered samples, and if you can tell me which ones came from tuberculosis cases and which ones did not, I will believe it all.' I agreed, and he left, evidently thinking he had me cornered. The samples came, with only a number on each one, and I reported on them at once. Three contained bacilli, and I wrote him the result and gave him the numbers. A more convinced and enthusiastic man than he was when he made his next visit I never saw. He had lost his contempt for 'germs,' and the little ironical smile he wore on his last visit as he looked at my culture tubes had disappeared. After that when he had doubtful cases he often sent me the samples for examination, and the results left his new faith unshaken."

As time passed, however, it became evident that not everyone with tuberculosis has the germs in the sputum. Even those with the adult and destructive type pass through a considerable period of time with sputum free from tubercle bacilli. Indeed, it has been estimated that only in about one in three cases with minimal adult lesions is it possible to demonstrate tubercle bacilli in the sputum. Moreover, the fact that the first infection, or childhood, type of tuberculous process rarely discharges tubercle bacilli so they can be detected in the sputum is well known. In cases of tuberculous pleurisy with

effusion, the bacilli may escape detection on many examinations. This is also true of material examined from other tuberculous lesions, such as that from cold abscesses. Obviously, if one depends upon the laboratory examination to screen out cases with tuberculous lesions in their bodies, more will be missed than found. Hence, the laboratory examination is a coarse tuberculosis screen.

The X-ray has been looked upon by many as an extremely fine screen. In the minds of the lay public, there is a great deal of mystery associated with it. Many think it is as easy to look through a human body and see areas of disease as it is to look through an aquarium and see fish. When the areas of disease are comparable in size to fish in an aquarium, this is true in certain parts of the body, but the fact, that when one looks into an aquarium there are thousands of living objects in the water which the unaided human eye is incapable of detecting is seldom appreciated. In other words, one does not see all of the life and activity in the aquarium; likewise in an X-ray examination one does not begin to see all that is present. Indeed, one is dealing only with lights and shadows with no appreciable magnification. Certain parts of the body lend themselves to X-ray examination better than others; for example, smaller lesions will be found in the lung parenchyma than in most other parts of the body because of the air content of the lung.

The two phases of X-ray examination now in common practice differ considerable in their gradation. The fluoroscope is a coarser screen than the X-ray film. The fluoroscopic examination is valuable in studying movements of organs of the chest, such as the diaphragm and heart. It is valuable in gastro-intestinal examination aided by the introduction of some opaque substance such as barium sulphate. It is also valuable in screening out certain types of lesions in the lung parenchyma. Large lesions are easily seen. Some of the small, sharply-outlined, dense lesions, such as deposits of calcium and areas of rather dense fibrosis, cause shadows that are plainly visible on fluoroscopic examination. Yet, even when these are seen, no record is left except what one may jot down by way of description, and one must then resort to the X-ray film for a study of location with regard to the anterior or posterior part of the lung and with regard to finer details.

The fluoroscopic examination, therefore, is helpful in screening out such lesions, but the danger lies in the fact that certain lesions, and often the most treacherous of them all, entirely escape detection by fluoroscopic examination. Soft, recent lesions, those which are frequently progres-

sive, are missed more often than found by the fluoroscopic examination. The best evidence we have of the coarseness of the fluoroscope as a tuberculosis screen is the testimony of the first-class roentgenologists of this country. Most of them do not manifest much confidence in the fluoroscope in the diagnosis of early tuberculosis in the strict sense of the word. The fluoroscope gives us little or no aid in the detection of tuberculous lesions in parts of the body other than the gastro-intestinal tract and the lungs, and even in these parts many lesions are not detected. Therefore the fluoroscopic examination is a coarse screen in tuberculosis work.

The X-ray film examination has several advantages over the fluoroscopic examination, and is the most reliable of the coarse screens. First, if properly made and preserved, it is a permanent record of the shadows cast on the date of examination; second, it aids in localizing the lesion with reference to the anterior and posterior part of the lung; third, it gives more detail; fourth, it is of value in detection of tuberculosis of some other parts of the body besides the lungs and gastro-intestinal tract. This is particularly true of lesions of the bones and joints. The bones lend themselves fairly well to X-ray film examination in the detection of tuberculosis. Calcium deposits located in the cervical lymph nodes are frequently detected by X-ray film examination. This phase of the examination is also of value in detecting deposits of calcium in the mesenteric lymph nodes.

When one applies the tuberculin test to large numbers of people and then makes X-ray films of the various parts of the body of all the positive reactors, one is amazed at the great discrepancy between these two phases of the examination. In other words, a relatively small percentage of those who react positively to the tuberculin test show demonstrable tuberculous lesions by X-ray examination, because the X-ray film does not magnify as does the microscope. In other words, an area of disease in the lung parenchyma, which lends itself so admirably to X-ray examination, must be large enough to be plainly visible to the naked eye before it casts a shadow on an X-ray film that is visible to the naked eye. Therefore, all lesions smaller than this, even though they are located in the lung parenchyma, will escape detection by the X-ray film examination.

There can be little doubt that after tubercle bacilli find lodgment in the lung parenchyma, in most cases, perhaps the vast majority, there is a considerable period of time during which the field of combat between the tubercle bacilli and the defensive mechanism of the body is microscopic

in size. Even at the post-mortem table, it would not be seen except when the field is placed under a microscope. During this period of time, the X-ray film examination is of no avail. It is probable that many tuberculous lesions are brought under control so well by the defensive mechanism of the body that they never become sufficiently large to cast a shadow on the X-ray film.

From this point on, the extent of disease will vary from that barely large enough to cast a shadow to massive proportions. If it is of the first infection, or childhood type, one may later see, at the site of the parenchymal lesion, deposits of calcium and true bone, which we then speak of as a Ghon tubercle. Along with this, one sees similar deposits in the hilum lymph nodes. If the disease is of the re-infection, or adult type, as it progresses one may see evidence of fibrosis and, in many cases, cavity formation.

It is obvious, therefore, that the X-ray film is a coarse screen in the detection of tuberculosis, inasmuch as the lesion must be sufficiently large to be visible to the naked eye, even when located in those parts of the body which especially lend themselves to X-ray examination, such as the lung parenchyma and the bony framework. Lesions in the lymph nodes of the cervical region, the mesenteric nodes, and even the mediastinal lymph nodes which do not contain calcium are not detected with certainty by the X-ray film. There are numerous other parts of the body where tuberculosis may exist, and the X-ray is of no avail in its detection.

#### FINE SCREENS

*The post-mortem examination* is a fine screen, but it is slightly coarser than the tuberculin test. In the earlier days of tuberculosis work, the post-mortem examination very frequently revealed disease of advanced degree which had not been detected by any other phase of the examination. The early pathologist pointed out that tuberculous lesions could be demonstrated in the bodies of approximately 90 per cent of those who died of any cause. In many of these bodies, in fact in the majority of them, tuberculosis had not been detected before death; hence, the post-mortem examination was recognized as the finest screen of that time. Minute tuberculous lesions may escape detection by the post-mortem examination. It is impossible to examine all parts of the body with a microscope; hence, there appears a discrepancy between the tuberculin test and the post-mortem findings. However, this discrepancy is not so very great. In cattle, the veterinarians have found, at post-mortem, demonstrable lesions in a high percentage of the animals reacting positively to the test.

*The Tuberculin test* when properly used is the finest of the screens since it detects nearly all persons who have tuberculous foci in their bodies. In the earlier days of tuberculosis work this screen was too fine to be practical; indeed, this statement is true even today in certain parts of the world. In other words, in these parts the vast majority of the people have foci of tuberculous disease in their bodies. If everyone had been infected with syphilis, the biological tests for this disease would be of little practical value. The lower the incidence of disease, the more practical the test becomes. Since the possibilities of tuberculous infection have been so tremendously reduced, the test has become very practical.

In differential diagnosis, the tuberculin test is of great value in a negative way. A person with a demonstrable lesion who reacts negatively to the tuberculin test, when it is properly applied, most likely has a non-tuberculous lesion. When one is tracing sources of exposure, the test is very valuable in a positive way. For example, if nearly all the children of a family react positively to the tuberculin test, one is quite certain that some animal or human associate has been, or is, suffering from tuberculosis, or is acting as a carrier of tubercle bacilli. Yet no biological test is infallible, and one can cite occasional cases in which the test was negative, but tuberculosis was demonstrated by other means. These cases are so rare, however, that they are practically insignificant so far as discrediting the tuberculin test is concerned. Inasmuch as the persons reacting positively to the tuberculin test are all potential cases of the adult and destructive type of tuberculosis, and some of them already possess this type of disease, the test sorts very quickly from any group of people those who should be examined for tuberculosis. Therefore, this extremely fine screen has become practical in many parts of the world.

In tuberculosis control work, all of our screens must be brought into operation. Although the tuberculin test does screen out practically all who have tuberculous foci in their bodies, it does not localize the foci. The only fine screen we have for localizing foci is the post-mortem examination. During life when localization of foci may be of some avail, we have nothing but coarse screens. Sometimes one helps, sometimes another; they must all be used. The best of the coarse screens is the X-ray film, and even this is woefully lacking in the localization of tuberculous foci in the human body. Therefore, there is great need for further development of these screens to be used in localizing tuberculous processes.

## The Minneapolis Nurses' Association Helps Its Unemployed

MARY MARGARET MUCKLEY, R.N.

*Executive Secretary, Third District M. S. R. N. A.*

*Minneapolis*

**D**URING the summer of 1931, signs appeared which indicated an unemployment problem in our District Association needing emergency care. The Board of Directors talked over the needs of the members in such an emergency and the responsibility of the Board toward that need. This resulted in the appointment of a committee on unemployment. Nine members were appointed to serve on this committee, representing the Private Duty, Institutional and Public Health Fields. The committee began its work in September, and at the first meeting divide itself into three sub-committees, with three members on each sub-committee, and each sub-committee with a special function.

The sub-committee on post-graduate study, recommended that nurses be urged to do more post-graduate work, both in practice fields, and in theory, and that the District Association provide a Scholarship Loan Fund for its members. The Loan Fund was created and members are now making use of it.

The sub-committee on registry membership has had a more difficult task and its work is not nearly finished. It is still working on recommendations relative to qualifications for membership in professional nurses' registry, the length of a probation period for such members, the question whether new graduates should have their state registration before being allowed to use the registry, why nurses should be called according to number, and the advantages of a vocational guidance council to advise members, who, for one reason or another, are not being called by their own hospital on private duty cases.

The sub-committee on "work relief" will perhaps be of greatest interest to the *Journal Lancet* readers. This sub-committee is made up of a private duty nurse, a hospital superintendent, and the director of the Minneapolis Visiting Nurses' Association. It drew up, for the consideration of the general unemployment committee, recommendations as to help that could be given unemployed nurses through "made work." After approval of these recommendations by the Board of Directors and the General Assembly of the

Association, the committee proceeded with its plans.

In November, after the Community Chest drive was over, a mimeographed letter was sent to all members of the district, telling of the nurses who needed more work, and of patients ill in their homes who needed more nursing care but were unable to pay for it. The letter stated that a fund was necessary to give "made work" to our unemployed, and asked each one receiving the letter to pledge \$1.00 a month for a period of one year, by signing and returning on or before December 1, 1931, the pledge slip at the foot of the letter.

Nurses responded most generously to this letter; the money received was put into the "Nurses' Work Relief Fund," and checked out to members sent on work relief cases. Any member of the Association may make application for work through this fund. For every applicant a blank is filled in, giving the required information. The committee passes on each applicant. If the applicant is approved, her name is placed on the list for work relief. If she is found ineligible, the committee so informs her, stating the reasons.

Calls for work relief have been answered only from organizations and institutions with a social service department able to make adequate investigations and to state the inability of the patient's family to pay for needed nursing service. Calls have been received from: the Family Welfare Association, the City Poor Department, the Ripley Memorial Hospital, the University Hospital, the Minneapolis General Hospital, the Community Fund office, and the Visiting Nurses' Association.

The calls go through the same routine in the Nurses' Official Registry as do all other calls for private duty nurses, and are entered in the daily record in the same way. Cases are limited to three days or three nights. In extreme cases where a life may be saved, the nurse is permitted to stay longer.

The nurses who are called for work relief give ten hours of service for an eight-hour day fee. In other words, they do their bit by giving two hours of service a day without charge. The rules allow but ten days' work per month to each nurse.

This makes a wider distribution of work possible.

Advisory service was given to the committee by a vocational guidance expert and a psychiatric social worker in order that the best help and the kind needed would be given through the work relief plan. Social relief-giving agencies were consulted before we put the plan into execution, and much encouragement was given us.

The physicians who attended the families in which our work relief nurses gave service have commented in a kindly manner about the value

of the plan. Prominent citizens also expressed approval of having an organization do what it can for its unemployed during the present conditions.

This plan of work relief has done much for the nurses and nursing in our city. It has helped those of our members who want to help themselves, but who, through no fault of their own, are in need. It has helped families visited first by economic depression and then by sickness to secure skilled nursing care for brief periods.

## Simple Feeding Cases

C. A. STEWART, M.D.

*Minneapolis*

*This is the second of a series of short practical articles on Clinical Pediatrics, conducted by Dr. C. A. Stewart, Associate professor of Pediatrics, in charge of the Out-Patient Department of the University of Minnesota Hospitals.*

**T**HE first case was a full-term baby girl who weighed seven pounds and two ounces at birth. During the stay in the hospital the infant's record was uneventful and when dismissed on the eleventh day post partum her weight was seven pounds, one ounce. When one month of age the baby was again weighed, and since leaving the hospital she had gained only four ounces. The mother reported that the infant nursed well, seemed satisfied, and cried very little, and also volunteered the information that enough milk ran from the breasts between nursings to saturate rather thick pads kept over the nipples.

Since it was evident that the baby was underfed, the mother was advised to purchase a pair of glass nipple shells to be worn under a brassiere in such manner that the milk escaping from the breasts might be collected. This device enabled the mother to collect between seven and eight ounces of milk daily which was given to the baby in addition to the amount obtained at the breast by nursing. This simple procedure accomplished the desired result, and when the baby was three months of age her weight was eleven pounds and four ounces.

Previous to this time the mother noted that the amount of milk escaping from the breasts and being collected in the shells was gradually decreasing, and before the end of the fourth month the leakage from the breasts had ceased. At this time the baby was again weighed, and during the past month had increased only ten ounces in weight; indicating that the food intake

was again inadequate. At this time, rather than giving the baby complementary milk feedings, the mother was advised to feed her well-cooked, thick farina seasoned with salt and a little sugar. The cereal was to be given before the 10 A. M. and the 2 and 6 P. M. feedings, starting with two teaspoonfuls and increasing gradually to three heaping tablespoonfuls three times daily. The baby took the cereal well and again started to gain weight satisfactorily.

When the baby was five months of age, ripe banana was added to the diet, to be given in increasing amounts until one banana was taken daily. When six months of age, the baby weighed sixteen pounds and three ounces, and at this time carrots, peas and spinach were included in the 2 P. M. feeding in addition to banana and breast milk. The mother also was instructed to cook the cereal in half cow's milk and half water and to alternate farina with oatmeal. At the eighth month the baby weighed nineteen pounds and one ounce, and weaning was started by omitting two nursings which were replaced by giving boiled whole cow's milk. At ten months the weaning had been completed and the baby was thriving on three meals daily with a mid-afternoon lunch.

The second case was a healthy full-term infant who regained its birth-weight (7 lbs. 6 oz.) before leaving the hospital. The following week the baby was extremely irritable which greatly accentuated the mother's tendency to be nervous. During this week weighing the baby before and after nursing revealed that the amount of milk the

baby obtained daily from the breast averaged considerably below that recorded for the preceding week at the hospital. When three weeks of age the baby weighed seven pounds and five ounces, having lost one ounce during the first seven days at home.

In this case there was no loss of milk from the breast, and after nursing, which the baby did vigorously, no additional milk could be expressed from the breasts. These observations indicated that the milk supply was inadequate to meet the infant's needs, so the mother was advised to give the baby well-cooked thick farina seasoned with salt and sugar before and in addition to the 10 A. M. and 2 and 6 P. M. nursings, gradually increasing the cereal until two tablespoonfuls were taken at each of these three feeding periods. The following week the baby gained six ounces; thus when four weeks of age she weighed seven pounds and eleven ounces. Subsequently the cereal given was increased to four tablespoonfuls three times daily, and during the following month the average weekly gain amounted to about five and one-half ounces. Thus, when the baby was two months of age she weighed nine pounds and one ounce. At this time the mother started cooking the cereal in half cow's milk and half water, and at three months of age the baby had reached a body weight of ten pounds and thirteen ounces.

When the fourth month was reached, banana was added to the diet which the baby took nicely, and at the fifth month the birth weight had exactly doubled. Since the baby was doing nicely, no further dietary changes were made; but when weighed four weeks later, the baby showed a gain of only eight ounces for this period. The mother stated she was certain her milk supply was decreasing again since the baby was fussy at the breast and nursed only a short time, particularly during the last feedings of the day. Thus, when the infant was six months of age, complementary bottle feedings were started for the first time,

giving the baby three ounces of formula after the 2, 6 and 10 P. M. nursings. The formula used in this case included nine ounces of cow's milk, three ounces of water and one tablespoonful of lactose, to which, after being boiled and cooled, nine drops of lactic acid were added. As time went on the mother increased the amount of formula given, and the difficulty in getting the baby to nurse also increased. As a result nursing periods occasionally were omitted, and by the eighth month the baby was no longer on the breast. At this time, however, she was plump and thriving, weighing eighteen pounds and fourteen ounces.

These two cases illustrate some of the expediences which may be employed to keep a baby on the breast and to prevent premature weaning. Occasional instances are seen in which considerable milk is lost from the breast between nursings, and in such cases the use of glass nipple shells to collect the milk proves of value. At other times manual expression of the breast after nursing favors an increase in milk supply in cases where the baby does not nurse vigorously and only partially drains the breast.

When measures directed toward giving the baby the entire and maximum amount the mother is capable of supplying fail to supply adequately the infant's needs, well-cooked farina may be given at two or three of the days' feedings, and may be started as early as the third week of life. The cereal may be further enriched by cooking it in milk and water if necessary. When these measures fail to permit the baby to gain weight normally, complementary milk feedings must be given, but always after the breast has been drained completely. Some form of acidulated cow's milk usually proves to be very satisfactory. In general, one should be careful to offer the baby the smallest amount of the artificial formula required, otherwise in a short time the infant may take the bottle well but may refuse the breast.



## Clinical Pathological Conference

By E. T. BELL, M.D.

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The Department of Pathology of the University of Minnesota conducts a course in clinical pathologic conferences. Cases are selected in which a thorough clinical study has been made. Many physicians have expressed interest in this type of study and therefore the Journal-Lancet is publishing a series of these conferences. The clinical data are taken from the hospital records and are given absolutely according to the data on the record. Following the clinical report a summary of the pathologic findings is given and a few comments are made on interesting features of the case.

**AUTOPSY-28-1625:** The case is that of a white man, age 60, admitted to hospital on September 8, 1928, with complaints of swelling of the feet and ankles, dyspnea, abdominal swelling, palpitation of the heart, and general weakness. He dated this illness from two years ago when he first noticed shortness of breath on exertion. During the past six months his condition became gradually worse and for the past three months he had noticed marked swelling of the ankles although he had had some swelling for the past two years. No other mention is made of cardiac symptoms in his past history, but he gave a history of rheumatism 15 years ago and he had small pox and bubonic plague several years ago. Six months ago he was in the present hospital when he had abdominal paracentesis. He gave a history of some urinary frequency and nocturia as well as dysuria. He had some vertigo.

On physical examination he was found to be fairly well nourished. There were moist rales throughout the chest; heart sounds were very difficult to hear, and there was a systolic murmur over the mitral area; the aortic area was described as normal. There was a blowing systolic murmur over the pulmonic area. The abdomen was "distended with fluid." The blood pressure was 100/70. The radial pulse was very weak. An electrocardiogram showed regular rhythm, absence of P wave in lead I, QRS diphasic in lead I with marked arborization in leads II and III, and T inverted in lead I. X-ray of the heart showed it to be 62%. Examination of the blood showed hemoglobin of 93%, 5,460,000 red cells, and 6,500 white cells. The Wassermann was negative. The urine showed albumin from negative to a heavy trace, occasional hyalin and granular casts, as well as waxy casts. The patient was given digifolin.

He complained of abdominal distension, inability to void, and pain in the lumbar region. He was given digitalis but this was discontinued because of nausea. A note on November 30

showed him to have had moderate edema of the ankles. There was marked eversion of the feet, due to arthritis. The liver was palpable three fingers breadth below the costal margin; there was dullness in the flanks. The heart was outside the nipple line, and there was a distinct systolic murmur at the apex and over the precordium. There were moist rales at both bases. There was moderate cyanosis of the lips. The blood pressure on November 30 was 145/90. The abdomen was tapped but on December 12 the liver was still two or three fingers breadth below the costal margin, although the edema of the legs and ankles had disappeared. The patient died at 4:05 A. M. December 15, 1928.

*Postmortem Report*—Marked pyorrhea. Severe edema of the lower extremities and over the sacrum. Deformity of both feet, apparently due to arthritis. No peritonitis; 2,000 cc of dark brown ascitic fluid. Liver edge 5cm below the costal margin in the right mid clavicular line. Right pleural cavity contains 2,000 cc of dark brown fluid; no pus; left pleural cavity 50 cc. The pericardial cavity is almost obliterated by fibrous adhesions. The heart is 16 cm in width and weighs 600 grams. Marked thickening of the aortic leaflets with calcification; the leaflets are sealed together at the commissures; several small firm grayish white rheumatic vegetations on the edges of the old thickened leaflets. The mitral leaflets are also markedly thickened and sealed together but show no active lesions. The tricuspid and pulmonary valves are normal. The coronary arteries are practically normal. There is marked hypertrophy of the left ventricle; dilation of all the chambers. Infarction of the lower part of the right lung. Chronic passive congestion of the liver and spleen.

*Diagnoses*—Old rheumatic mitral and aortic valve defects with hypertrophy and dilation of the heart. Recurrent rheumatic endocarditis of the aortic leaflets. Chronic passive congestion of the lungs, spleen, and liver. Infarction of the

lung. Hydrothorax and ascites. Hypertrophy of the prostate.

*Comment*—The valvular lesion is the result of the attack of acute rheumatic fever which the patient had 15 years previously. The presence of fresh vegetations on the old scarred leaflets shows a terminal recurrence of the rheumatic infection. The development of the old valvular defect is frequently hastened by recurrent rheumatic infections.

*Autopsy-32-258*: The case is that of a white man, age 70, who was admitted to hospital February 2, complaining of dyspnea, orthopnea, pain in the right chest, and occasionally precordial pain. He also complained of a rather severe cough. The past history is without significance. There is no record of his having had rheumatic fever. He stated that for ten years he had suffered somewhat with dyspnea and orthopnea. His condition remained about the same until 2½ years before admission, at which time he was awakened during the night with severe precordial pain. At this time he thought he would die and was admitted to a hospital where medical attention was given. The condition cleared up after a time and he was discharged and returned home. For the past two years he had been at the county home, and off and on during this period he had complained of pain in the region of the heart. The dyspnea had become progressively worse and he had a hacking cough. He denied swelling of his ankles at any time.

Physical examination showed a well developed, fairly well nourished man who was complaining of coughing, dyspnea, and orthopnea. The pupils reacted to light and accommodation. The ears, nose, and mouth showed nothing of note save that there were only 3 teeth remaining and these were carious. The chest was symmetrical and tended to be barrel shaped; there was no evident lagging of either side on respiration. Squeaky rales were heard all through the chest bilaterally. On admission the heart showed no audible murmurs; the rate was slow but regular; the borders were within normal limits. The abdominal wall was firm; the spleen was not palpable; the liver edge was just beneath the costal margin; there was no

tenderness or muscular rigidity. There was reducible indirect hernia on both sides. The prostate was normal in size. Impressions included chronic bronchitis, bronchial asthma, and possible coronary thrombosis. The blood pressure on the day after admission was 140/80.

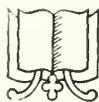
Further examination of the heart shortly after admission showed that there was slight hypertrophy, the apex being located in the fifth interspace 13 cm to the left of the mid sternal line. A systolic murmur was heard over the entire precordium at the first intercostal space and transmitted poorly into the right neck vessels. On February 5 the patient's temperature was 102° and he had Cheyne-Stokes respiration. On February 8 a note was made that the diagnosis was probably aortic stenosis. He became progressively worse and died February 12.

*Postmortem Report*—Body well developed and well nourished; no edema. Carious teeth with pyorrhea. No adenopathy. No ascites. No hydrothorax. Old pleuritic adhesions. Pericardial cavity largely obliterated by fibrous adhesions. Heart 16.5 cm in width; weighs 693 grams. Definite thickening of the aortic cusp of the mitral; marked thickening and slight shortening of all three leaflets of the aortic valve; calcification of the leaflets which extends out toward the free edges; the leaflets are sealed together at the commissures. The effect of this lesion is a marked stenosis with slight insufficiency. Rather marked coronary sclerosis but no narrowing of the lumens. Marked hypertrophy of the left ventricle. Practically no sclerosis of the root of the aorta. Bilateral bronchopneumonia. Bilateral inguinal hernia. A few gallstones but no active cholecystitis. No chronic passive congestion of the liver or spleen.

*Diagnosis*—Hypertrophy of the heart due to aortic stenosis with slight insufficiency and adherent pericardium.

*Comment*—This lesion is believed to be the end result of an old rheumatic endocarditis. Death in this case was not due to heart failure but to bronchopneumonia.

E. T. BELL, M.D.



## Social Insurance

EDWARD H. OCHSNER, M.D.

*Chicago*

THE founders of our government subdivided it into three branches; the administrative, the legislative, and the judiciary. This was done on the theory that each had a distinct function to perform and that they would all act somewhat as checks and balances upon each other. This seemed logical at the time and undoubtedly has many advantages, but our founders did not and could not foresee one of its dangers and one of the abuses to which this division was to be put, namely, the practice of sidestepping duty and responsibility. One of the chief governmental in-and-outdoor sports today is "passing the buck," with an "open season" the year around.

In a project involving as many problems as Social Insurance does, all the branches of the government would be involved in its execution, the administrative in administering it, the legislative in enacting the necessary laws, and the judiciary in adjudicating them. Let us then examine briefly how the different branches have departed themselves in the more recent past. Let us start by examining just one typical administrative activity of both the federal and the state governments.

Individual members of the medical profession have repeatedly called attention to the great need of a careful study of all delinquents and criminals in our state and federal institutions in order to determine the mental and physical condition of each member of these two classes with a view to their rehabilitation and possible reclamation and yet, almost nothing has been accomplished along these lines by governmental agencies. Dr. Frank L. Rector who recently completed a survey under the auspices of the National Society for Penal Information on health and medical work in all state and federal prisons and adult reformatories, states unequivocally that in not one of these institutions is there a well-rounded balanced medical and health program. While some of them provided acceptable accommodation for the care of the acutely sick or injured, there is little or no provision for the rehabilitation of the physically handicapped, so that they will be better equipped for earning an honest living after their discharge to civilian life.

Just one typical example. On the day Dr. Rector visited the Ohio State Penitentiary, there were 4,475 prisoners within its walls, of which 156 were hospitalized. There was but one physician on the staff, all other attendants at the hospital were prisoners. While the physician was nominally on a full time basis he was carrying on an outside private practice as his salary from the state was insufficient to meet his living expenses. What can one part-time physician accomplish with that many patients, a large per cent of whom are physically handicapped, mentally abnormal and emotionally maladjusted? Ohio is a fair example. In most of the other penitentiaries and in the federal prisons conditions are no better and in some even worse.

Now let us investigate some of the legislative problems. While nearly every legislative body contains some men of outstanding ability the great majority of legislators have not the slightest conception of what is required of their position and blindly follow their party bosses who are not generally known for their altruism, their patriotism, or a burning desire to promote the public welfare. One of the worst features of our legislative activities is the fact that a small, well-organized and insistent minority can usually get its measures enacted into law unless some other group is adversely affected by the proposed legislation and makes a counter-attack.

Another bad method of securing legislation is the system of trading. An interesting occurrence of this sort happened in the state of Illinois in 1923. About that time a Chicago mayor was disgracing not only his city and state but the nation by the slogan, "Hit King George on the Snoot." A free citizen from the corn lands of the state decided that he would like to be sent to the state legislature, took up the battle cry, had just one plank in his platform, namely to make the American language the official language of the state. He was elected. By use of extensive vote trading he secured the passage of the following:

### OFFICIAL STATE LANGUAGE

An act establishing the American language as

*(Continued on Page 285)*

THE  
**JOURNAL-LANCET**

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South Dakota State Medical Association	The Soo Railway Surgical Association
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### MUST EDUCATIONAL BROADCASTING GO?

WRHM, operating over the same radio wave length of 1250 kilocycles as that used by the University of Minnesota broadcasting station, has petitioned the National Radio Commission at Washington for full time use of this frequency.

At present, WRHM uses 104 hours per week, and 20 hours is allotted to Carlton College, St. Olaf's College and the University of Minnesota. If the request is granted, these educational institutions will be put off the air by a commercial one.

Criticism of radio programs is often heard but rarely is anything further done about it. Here now, is an opportunity for each one to express his or her views by writing to the Radio Commission before the end of this month, when the matter comes up for hearing.

Constructive criticism is welcomed by those who are sincerely trying to administer their offices in the public's interest.

A. E. H.

### PASTEURIZATION OF MILK

The purpose of the pasteurization of milk, is simply to destroy any harmful bacteria that it may contain.

If there were no bacteria to destroy, there would be no need of pasteurization.

The earlier milk is pasteurized, the fewer the bacteria.

The fewer the bacteria, the less is the danger of their doing harm.

Delay means more bacteria and ultimately, pasteurized cultures instead of pasteurized milk; its advocacy is not only a reflection on our scientific enlightenment but violates our esthetic sense.

We believe in early pasteurization and subsequent temperature control; if possible, let us have both.

A. E. H.

### KINETOCYTES

Since Van Leeuwenhoek's microscope found the red-blood corpuscles in 1673, many have busied themselves with other discoveries in the blood.

Metchnikoff described phagocytosis in 1884. He attributed immunity to leucocytosis and Ehrlich later classified leucocytes and gave us the side-chain theory.

Edelmann of Vienna and Goldstein of Camden have recently been studying a motile body which may prove to be a new, or fourth, blood element to which the name "Kinetocyte" has been given. They are "found moving about in all directions between the immovable, stationary erythrocytes, leucocytes and thrombocytes."

We shall be interested in reports of their further investigation especially as to significance in health and disease.

A. E. H.

### NOCTURNAL DYSPNOEA

In the February issue of Modern Concepts of Cardiovascular Disease, published and distributed by the American Heart Association, we find the following phrase in an article on the "Treatment of Heart Failure Apart from the Use of Digitalis"—"but when there is nocturnal dyspnoea as in the case described above, morphia will be necessary."

To those who had the privilege of making bed-

side rounds with Professor Osler, this must awaken memories of one of his classic expressions. After listening to a cardiorenal patient make complaint of "hard breathing at night" he would turn to his Peripatetics and say "In cases of nocturnal dyspnoea, whether of cardiac or renal origin, give morphine."

Osler was frequently accused of being a therapeutic nihilist and it is only natural to find that any such recommendation as he *did* make should survive. Those who have had much experience in this type of cases will recognize in that pronouncement a truth of such excellence and enduring beauty that they will not let it die.

We congratulate the American Heart Association on the high standard of their articles; the Digitalis number was a concentrated gem. It was a happy thought to send these leaflets to the profession at large.

A. E. H.

## SOCIETIES

### The Minnesota State Medical Meeting

What will undoubtedly be the most varied and colorful and universally interesting program of any annual meeting of the Minnesota State Medical Association, is scheduled for May 23, 24 and 25 at the St. Paul Auditorium.

By an entirely new scheme, three to twenty sections will be held simultaneously. There will be separate medical and surgical sections; some forty small group table demonstrations; programmed motion pictures on a variety of subjects; and an afternoon of clinics. The program, especially by reason of its diversity, should make a strong appeal to the general practitioner, and many from the rural districts will read papers.

The total number of men appearing on all of the programs will exceed 120. Among the out of state speakers, there will be Dr. Francis Carter Wood of Columbia, Dr. Walter Sebening of Frankfort-on-the-Main, Dr. E. C. Campbell of Memphis, Dr. Theodore N. Davis of Greenville, South Carolina, and Dr. Ralph Major of Kansas City.

The scientific sessions begin on Monday afternoon with two conferences, one clinical pathological and the other radiological. They will deal principally with pulmonary tuberculosis and non-tuberculous pulmonary disease. The medical economics meeting in conjunction with the Minnesota State Hospital Association will have for discussion the subject of "Medical and Hospital Care of Veterans." Its speakers will be Father Maurice Griffin of Cleveland, Ohio, Dr. Olin West of Chicago, Mr. Fred R. Bigelow of St. Paul and Mr. E. V. Cliff of Ortonville.

The Tuesday scientific program opens at 8 A. M., one section occupying itself chiefly with surgical aspects of obstetrics, and the other with cardiac disease, and the

role played by quackery in neuroses. At 10 A. M. the meetings will adjourn to the exhibit hall for small group table demonstrations, of eyegrounds, ulcerative colitis, the physiological action of animal venom, the use of the artificial larynx, peripheral vascular disease, the photo-electrometer as applied to hemoglobin determination, the Friedman hormone test, Congo red test for amyloids, syphilis, practical points and therapy, trichomonas vaginalis, the tuberculin test, tularemia, varicose leg ulcers, typing for pneumococci, horseshoe kidney, lung abscess and lipiodol, foreign bodies and medical conditions in the esophagus, blood transfusion, undulant fever, primary tuberculosis in childhood—X-ray films, fresh pathology, cauterization of the cervix, audiometer, schick test, blood, cholecystographic technique.

A joint session will follow at 11 A. M. addressed by Dr. Campbell on fractures in and about the neck of the femur. Another joint session following lunch will be devoted to malignancy, with Dr. W. J. Mayo presiding.

The medical section for the afternoon will be devoted to a symposium on diseases of childhood. The surgical section to problems involved in thyroid diseases, intussusception in infants, tuberculosis of the kidney, cancer of the rectum.

Tuesday night there will be the annual banquet with Dr. Hugh Cabot, Rochester, as toastmaster; Dean R. E. Scammon of the University Medical School will talk on "The Relation of the School to the Man in Practice;" Rev. W. C. Sainsbury of Fargo, North Dakota, on "The Family Doctor."

Wednesday's scientific sessions will follow Tuesday's schedule with separate medical and surgical sections meeting until 10 A. M., followed by the table demonstration hour and the joint session terminating at 12. A joint session of an hour will open the final Wednesday afternoon session followed by two and one half hours of clinics, to be held also at the Auditorium meeting place.

The paper on peptic ulcer by Dr. Sebening, the explanation by Dr. Davis of his method of prostate resection and the discussion of hypertension by Dr. Ralph Major are very inviting. A special clinic in first aid by the Minnesota Highway Patrolmen Wednesday between 1 and 2 P. M. will precede the afternoon dermatology, neurology, cardiac, fracture, pediatric and surgical clinics. The medical section will devote itself to recent developments in endocrinology; treatment of chronic arthritis with intravenous vaccines; and the periodic medical examination.

Among the talking and other films to be shown are "Cancer of the Skin;" "Bone Tumors;" "Puerperal Infection;" "Preliminary Haemostasis in Goitre Surgery;" "The Tucking Operation for Strabismus;" "Delivery of Twins;" "The Gillette State Hospital for Crippled Children;" "Features in Hospital Administration;" "Repair of Second and Third Degree Lacerations of the Perineum and Rectocele;" "Repair of Urethrocele, Cystocele and Lacerations of the Cervix."

Scientific and technical exhibitors will be found in the fourth street ball room. Alumni and fraternity and golf functions will afford relaxation, every taste and desire seem to have been anticipated and provided for.

## Proceedings of the Minneapolis Clinical Club

Meeting of January 14, 1932

THE regular monthly meeting of the Minneapolis Clinical Club was held in the lounge on the 20th floor of the Medical Arts Building, on Thursday evening, January 14, 1932. After dinner the meeting was called to order by the President, Dr. F. H. K. Schaaf, at 7 P. M.

At the close of the business meeting the following scientific program was presented:

DR. KENNETH PHELPS gave a "Brief Review of Recent Progress in Otology." There have been some important contributions along the lines of both divisions within a short time. First of all, the non-suppurative, where lesions develop, caused by whatever the condition might be, without infection that produces pus. Up to comparatively lately there has been no really good way of checking what causes impairments of hearing, the physiology of hearing, because we have to depend upon the patient, such as by putting a watch in front of his ear and asking him if he can hear it.

In the laboratory at Princeton, within the last year or so, an operation on cats was done which is of considerable interest. They isolated the eighth nerve, attached an electrode to this nerve and another electrode to some other part of the cat's body. Then they hooked these electrodes to a telephone loud speaker. Then, by speaking into the cat's ear, they could hear the sound in the telephone, which was located in most cases out in the hall, or a distant part of the building. Just how this can be, is rather vague. Here is sound, going through an ear, transmitted by the drum and the cochlear chain, carried to the inner ear, where it sets up a fluid vibration which is then transmitted to the nerve, appearing as a nerve impulse, and then, from that nerve we can pick up the sound directly into a loud speaker. How that happens the physiologists are at present studying. I do not believe an answer has been arrived at, but from a practical standpoint it makes it possible to test hearing in a way that we have never been able to do before. In other words, we can take a cat or an animal, and with this apparatus hooked to the eighth nerve, we can take high tones, low tones, loud or soft, and get them through. Then we can experimentally produce changes. We can increase tension of the cochlear chain and make perforation in the

drum. We can plug the round window and note the effect, and thereby get a more accurate notion of just where certain parts of hearing take place. And by that experiment we have learned several things. Most important perhaps is the function of the round window.

The round window serves as a sort of a safety valve on the inner ear pocket, and the sound hits one membrane and goes into the other end. About 50 per cent of sound is lost by means of this round window. If we have a patient or an animal on whom we plug this window, when we do something to cause him to lose his hearing, it comes back. In other words, we have a hope for those deaf people, in whom we can't find the cause of the deafness, that we will eventually work out some way of recognizing the cause in time, and increase, thereby, his ability to hear. We can do that on an animal, and we can increase tension and lose the perception of low sounds, cut this chain and loosen the tension of the tensor muscle and lose perception of high sounds. We plug the round window and the sound comes back even better than normal.

It is hoped that we may be able to do something eventually in a clinical way to improve hearing that is due to non-suppurative conditions. We have also found something that we had not known before, namely, that the loss of high tones, which we have always thought an inner ear affair, can be produced by middle ear conditions. So much for the non-suppurative conditions.

As far as the suppurative conditions are concerned, we feel that we have quite a bit to offer our patients who have abscesses of the ear and abscesses of the mastoid, but there have been some things that happen during the course of these conditions of which we haven't had a good explanation. For instance, after a mastoidectomy, we have a perfectly clean wound, the middle ear looks all right, and then we have a sudden discharge. Perhaps there is an interval between the time of our mastoid operation and the time of development of the brain abscess. Where do these processes go on? We have known, of course, anatomically that the petrous portion of the temple bone might contain air cells as well as the mastoid portion. There is an infection of the petrous bone, a petrositis, which adds one more complication to the possibility of middle ear

disease. Abscess of the middle ear may involve directly the petrous bone, as well as the mastoid. In every way the petrous bone as well has air cells; a mastoid also does.

There are certain conditions that we are familiar with in diagnosis of inflammation of the petrosal part of the bone, or petrositis. It may be in the mastoid, followed eventually by pain the second or fifth nerve. When the petrous tip is involved, it gets pretty close to the eighth nerve, involving very frequently the sixth nerve, with lateral abducens paralysis, pain in the ophthalmic division of the fifth nerve, together with some infection in the middle ear. I have such a case to report tonight. The films are of some interest.

(Slide). This child had an inflammation of his petrous bone at the time I saw him. This particular situation was not as well known as it is now, and now there has been a method worked out to open the petrous tip through the middle ear, as well as exploring it through the labyrinth in case of need. The petrous tip is usually invaded by extension from the middle ear to the air cells, or around the labyrinth. Sometimes it goes back to tagma. This picture was made after the child's condition had cleared up. It was taken in a position, showing his petrous bone. Dr. Malcolm Hanson very kindly made this plate for me. This shows the side that is not operated. The mastoid is full of air cells, very large, well developed, going all over the zygoma forward, and here the petrous tip going clear out in the petrous bone. On the other side you can see where the cells were and where they have apparently become sclerotic and are now probably healed up. That thing drained itself, fortunately, through the middle ear, probably around the mastoid cells. There is a question as to whether we ought, if we saw this patient now, to do any operation of opening the petrous tip.

I brought a specimen up here, which shows you where that operation is performed. The petrous tip is here, with the air cells connected with the middle ear. The anterior wall of the canal has pretty well been removed in order to get at this point here, in front of, and just above, this segment here, and goes into the opening which we made with a dental burr, clinically going right out and avoiding this internal corroded area, and eventually reaching the petrous tip. There are several cases on record now that have had this particular operation, and with success. It is rather a hopeful thing that we can, by realizing that there is such a condition as petrositis, perhaps

check, the development of some of these cases of brain abscess and meningitis.

## DISCUSSION

DR. J. C. MICHAEL: I was very much interested in Dr. Phelps' presentation. Last week I had occasion to see a patient in consultation who had a Gradenigo syndrome. This patient, a girl thirty years of age, had a mastoidectomy, and only several days later began to have severe pain—excruciating pain, very severe and persistent. Pain was localized in left frontal area and in the left half orbital region. Meningitis and cerebral abscess could be ruled out. The petrous bone was operated on about six days ago, and the girl has had no pain since that time.

DR. H. B. HANNAH: Is it possible to work through the old mastoid operation and sew up the petrous bone to the tip?

DR. KENNETH PHELPS: That should be done if it leads that way. The trouble is that it sometimes leads right through into the labyrinth. Often it doesn't have to be touched.

DR. WALTER H. FINK: How long had paralysis existed before operation?

DR. KENNETH PHELPS: About two years.

DR. WALTER H. FINK: Had it recovered very much?

DR. KENNETH PHELPS: He still had about 25 degrees of deviation.

DR. WALTER E. CAMP read a paper entitled "Pathology of Cholesteatoma of the Middle Ear and Mastoid, with report of a case."

The case I have to present is one of chronic suppuration of the middle ear with formation of cholesteatoma involving the middle ear and the mastoid. This patient was a young married woman, age twenty-five, who had a history of having intermittent earache and discharge in both ears since she was a child. The right ear had ceased discharging; the drum had healed and X-ray of the mastoid later showed it to be perfectly normal. The drum was thickened and showed some calcium deposits, but hearing was fairly good.

The left ear had continued to discharge intermittently throughout all of her life. She had had attacks of pain and some stiffness of the face muscles and some twitching of the muscles around the mouth. She had continued to have more or less seropurulent, fetid discharge from the left ear and attacks of dull headache, but not severe. About two weeks previous to the time I first saw her she had several hemorrhages from the left ear canal.

About seven years ago, she had several small tumors removed from both ear canals when both were discharging. These apparently were granulation tissue. She had had occasional attacks of

dizziness. Examination showed the right ear drum thickened, retracted and partly calcified. Mastoid normal. The left ear—no mastoid tenderness; bloody, foul, seropurulent exudate; canal about one-half filled with a pearly, greyish-white, glistening tumor mass, which extended into the middle ear cavity and attic.

X-ray examination showed the right mastoid practically normal. X-ray of the left mastoid showed breaking down of the mastoid cells extending from the region of the antrum to the lateral sinus walls.

A radical mastoidectomy was done on December 15, 1931. The mastoid cortex was intact and firm. The mastoid cells and antrum were converted into one large cavity about four-by-five centimeters in size, filled with a tumor mass identical in appearance with that found in the external canal and middle ear. The tumor mass also had eroded the inner half of the posterior bony canal wall, and lay in direct contact with the skin of the posterior canal wall. The tumor extended internally to the semicircular canals and cochlea, and posteriorly to the bony plate of the lateral sinus.

The tumor mass was carefully removed piecemeal. The facial canal was found eroded, and twitching of the face muscles was noted during the operation. The dura of the lateral sinus and middle fossa were covered by healthy bone. Facial paralysis developed immediately after the operation. No fistula in the labyrinth or semicircular canals could be found, although from the history and findings one was suspected. Recovery has been prompt to date, the wound epithelizing quite rapidly.

This specimen, which is somewhat fragmentary and part of it used for section, is here and we can pass it around. It consists almost entirely of cornified epithelium.

Cholesteatoma of the middle ear usually develops from a pre-existing marginal perforation in the drum; rarely ever from a central one. The most frequent site of the perforation is in the membrana flaccida or Schrapnel's membrane, usually in the posterior superior, or antero-superior quadrant. Here the stratified squamous epithelium of the canal grows over the margins of the perforation into the attic. Primary cholesteatoma, in which there is an intact drum, has been reported, but is very rare.

This case to me was very interesting because of the extent of the cholesteatoma. We see cholesteatoma filling the middle ear and attic frequently, sometimes very small, sometimes larger.

The extent of this tumor involving the whole middle ear cavity, antrum, attic, and about two-thirds of the mastoid cavity with erosion of the posterior canal wall, made this case interesting to me.

#### DISCUSSION

DR. ERLING HANSEN: This question of cholesteatoma in these old suppurating ears is really a very important one. We have a good many cases of chronic suppuration in which there are no cholesteatomas. As Dr. Camp said, most of these cases occur in those ears in which there is a marginal perforation, whether it includes the entire extent of the drum or perforation involving at least part of the margin of our tympanic membrane. The one important thing, I think, is the erosive action of cholesteatoma on the bony structures, and it is in these cases particularly that we have serious complications and sequela. Think of the many directions that these erosions may take in a general involvement such as this case Dr. Camp reports, where the whole cavity was practically taken care of, and very cleanly. (A point there in regard to the X-ray findings. Usually in the presence of cholesteatoma we find a rather smooth-walled cavity which shows up in the X-ray.)

If you think of erosion upward toward the middle fossa or posteriorly over the lateral sinus, and even beyond that into the posterial fossa, or forward into the posterior canal wall involving the seventh nerve, and also into the very dense bone of the labyrinth, the semicircular canals, see how many versions of severe complication we can get from the action of cholesteatoma, not only in the middle ear ear but in the mastoid, in which we very often find it. In those cases in which cholesteatoma is suspected, even though we don't see it, where it is turned back into the antrum and in the mastoid without being evident in the middle ear, the cases should be watched very carefully by X-ray, and if there is any question of cholesteatoma in the mastoid or in other parts of our ear structure, I think the safest thing to do would be to clean it all out and have a nice, clean cavity with the removal of the eroding substance.

DR. HENRY L. ULRICH: How often do these cholesteatomas invade the brain?

DR. WALTER E. CAMP: Cholesteatoma in the large European ear clinics forms about 5 per cent of all ear cases. About 15 per cent are chronic suppurating otitis media, one-third of which are cholesteatoma. As to what per cent invaded the brain, I am unable to say. In recent years, owing to more radical surgery, the instance is much less than it was.

DR. H. M. N. WYNNE read a paper on "Adenomyoma of the Recto-Vaginal Septum," with report of a case:

*Case Report*—Mrs. J. A. W., age forty-seven, white, housewife, was seen in consultation with Dr. C. B. Wright, October 10, 1927. Married twenty-six years, she had borne two children

twenty-five and twenty-two years ago, the first an instrumental delivery.

Menstrual onset at thirteen years of age, regular twenty-eight-day interval, five days' duration, moderate flow and painless until twelve years ago, when she began having a constant pain in the lower abdomen beginning seven days before the flow and lasting for ten days. The flow gradually increased in amount. Three years ago the periods came on every two weeks and lasted longer until recently when she had had almost constant bleeding. Clots as large as hen's eggs were passed with great pain. She had become pale and weak. Pain in the region of the sacrum and coccyx had been present for two years.

**Physical Examination**—The patient was well developed and well nourished. The skin was lemon yellow and the mucous membranes were pale. Hemoglobin 39 per cent (Sahli), erythrocytes 3,744,000, leucocytes 6,450.

**Pelvic Examination:** The vaginal outlet was moderately relaxed. The cervix was lacerated with eversion of the cervical mucous membrane which bled easily. Numerous Nabothian follicles were present. The corpus was enlarged, nodular and movable. No adnexal masses were felt. A firm, insensitive nodule, about two centimeters in diameter, could be felt attached to the cervix, lying just under the vaginal mucous membrane and adherent to it. The rectal wall was movable over the nodule.

Under medical treatment by Dr. Wright the patient's general condition had improved and on November 8, 1927, the hemoglobin was 78 per cent and the erythrocytes 4,280,000.

**Operation:** November 8, 1927, a difficult supravaginal hysterectomy and a bilateral salpingo-oophorectomy were done.

The ovaries were normal, both tubes enlarged, and all were lightly adherent in Douglas' pouch. Several small nodules were felt under the puckered peritoneum of the cul-de-sac. These nodules were adherent to the rectal walls.

The specimen was examined by Dr. O'Brien, who found adenomyoma of the corpus.

Five weeks after the operation, the nodule under the vaginal mucous membrane showed a bluish tinge and was connected with infiltration of the rectovaginal septum. Two months after operation this blue colored nodule was excised. Sections showed typical edometrial glands with blood cells in the gland spaces, and the glands were surrounded with stroma cells.

A year after operation the infiltration of the rectovaginal septum had decreased considerably.

December 23, 1931, four years after operation, there was no infiltration of the septum, but there was one small nodule back of the cervix. The cervix was movable, and there was no involvement of the rectal wall. The hemoglobin was 90 per cent (Dare).

The patient's symptoms were entirely relieved following the operation, and she has been in excellent health the past four years.

(DR. WYXNE): The term adenomyoma was first employed in 1895 by Von Recklinghausen to describe certain tumors of the uterus and tube consisting of edometrial glands and stroma surrounded by myomatous tissue. These tumors had been described by more than one observer several years before, and were thought to have originated from Mullerian tissue; however, Von Recklinghausen, whose opinion carried great weight, believed that they were derived from the Wolffian system. Thomas Cullen in 1896 demonstrated conclusively that these uterine tumors originated from the endometrium.

During the last thirty-five years similar tumors have been found outside of the uterus in many of the pelvic structures. No single hypothesis of the origin has yet been advanced to explain the presence of such tumors in the various locations in which they have been found. Each of the following hypotheses will explain some of the cases observed:

1. Direct extension from the endometrium.
2. Development from Mullerian rests.
3. Implantation of endometrial cells due to retrograde menstruation through the tubes.
4. Metastasis through the lymph channels.
5. Transplantation of bits of endometrium by operative trauma.

Adenomyata have been found in the following structures:

1. Uterus.
2. Tubes.
3. Ovaries.
4. Utero-pelvic ligaments (round ligaments, utero-ovarian ligaments, utero-sacral ligaments and broad ligaments).
5. Rectovaginal septum.
6. Vesicovaginal septum.
7. Perineum.
8. Abdominal wall and umbilicus.
9. Sigmoid and appendix.

Adenomyomata of the rectovaginal septum is not a rare tumor and is of more than scientific interest. Lockyer described two cases in 1913, and Cullen, Graves and others have published series of cases during the last seventeen years.

In reviewing the literature we are impressed with the serious complications which may occur as the growth invades the tissues in this region. The anterior rectal wall is frequently involved, and Graves made a colostomy in one patient to relieve her of almost complete obstruction from stricture of the rectum. Cullen has found the tumor completely surrounding and constricting both lower ureters, causing hydronephrosis and hydronephrosis. Cullen says that the tumor also may surround and constrict large pelvic nerve trunks. The most common symptom is severe pelvic pain a week before menstruation and during menstruation, referred in many cases to the rectum and lower back. This pain is thought to be due to the periodic swelling and menstruation of the blind glands. Advanced cases have been diagnosed as advanced carcinoma. A diagnostic sign of importance is the presence of blue domed cysts and polypi in the vaginal vault just posterior to the cervix.

The method of treatment advisable in a given case depends largely upon the stage of the growth. The complete excision of the tumor, when possible, is the only certain cure, but requires an extensive operation with a considerable mortality. In the earlier cases, particularly in young women, complete excision is practically always indicated. When the tumor has constricted the lower ureters, operative removal of the growth surrounding the ureters is necessary. Complete removal requires an extremely dangerous operation when the growth has invaded the anterior rectal wall. Incomplete operative removal has occasionally resulted favorably, but when complete removal is impossible or too dangerous, hysterectomy and bilateral salpingo-oophorectomy are, as a rule, followed by regression of the growth (Sampson, Graves, Cullen). Radium and X-ray therapy have been advocated by some and condemned as useless by others. Howard Kelly has suggested the probable value of electrical coagulation as especially adaptable for the destruction of such portions of the growth as cannot be safely excised.

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DR. T. A. PEPPARD read a paper entitled "Some Early American Medical Literature" (Demonstration), summarized as follows:

Approximately fifty years after the founding of the University of Mexico, the first permanent English settlement was founded in Jamestown, in 1607. In 1733 the population of the colonies numbered perhaps one million. Here was the beginning of a new nation. In the records of the

settlements of this country we find few instances in which the expeditions were accompanied by regularly appointed physicians or surgeons.

There was little inducement for English physicians to migrate to America. The London Company (1607) had engaged one William Wilkinson, and Toner mentions a Dr. Wotten as being among the first colonists at Jamestown. A Dr. Walter Russell accompanied John Smith on many of his voyages of exploration. In 1628 a Mr. Pratt was appointed surgeon of the Massachusetts Company and practiced a number of years in the vicinity of Cambridge. Samuel Fuller, one of the passengers of the *Mayflower*, was continually referred to as surgeon of the settlement, and although he had no diploma, the fact that he was deacon of his church seems, however, to have been adequate recommendation for his serving in this capacity. From Governor Endicott's correspondence, it appears that he furnished valuable services as medical advisor.

The first printing press was established at Cambridge, Massachusetts, in 1639, under the control of Harvard College. In 1708 there was issued in Boston a reprint on "The English Physician," by Nicholas Culpepper.

The first New Englander to publish a work on a solely medical topic was Rev. Dr. Thomas Thatcher, who in 1677 published his "Brief Rule as to Small Pox." It is found that the medical subjects discussed by writers during the colonial days were chiefly the following: 1, small pox; 2, yellow fever; 3, dysentery; 4, hydrophobia; 5, malignant sore throat. All of these at times assumed epidemic proportions, and resulted in a high mortality.

In 1721 Dr. Boylston took up the practice of inoculation for small pox, starting with the members of his own household, and in all 286 were inoculated by him and other physicians. Of this number only six died. During the same period there were 884 deaths from smallpox out of a total of 5,759 cases.

In 1743 Dr. John Lining, who had settled in Charleston in 1730, published a series of experiments made upon himself in the year 1740, which consisted of careful observation of his weight each morning and evening, weight of his food, and the weight and amount of urinary and fecal discharges. In 1756 he read before a society in Edinburgh an account of the "American Yellow Fever."

Then followed various treatises on diseases frequent in America, and in 1797 the first medical journal was published in this country, "The

Medical Repository," conducted by Samuel Mitchell, Professor of Chemistry of Columbia College, Edward Miller and Elihu H. Smith. (Demonstrated). The volume was dated 1804, and is marked Vol. 1, 3rd edition. This was because the first edition was twice reprinted. This journal contained short articles, essays and letters dealing with medical matters. It is of interest to note that in a letter from Dr. Richard Pearson, dated July 1, 1796, the inhalation of sulphuric ether is advocated to control cough in tuberculosis.

In 1808 there was published in Boston a volume of medical communications of the Massachusetts Medical Society, Vol. 1 (Demonstrated). This consisted of a goodly number of case reports, some of them extremely weird. Of particular interest is a report of a case of empyema (p. 66), and one of worms (p. 87).

The activities of Dr. Benjamin Rush are well known. From 1770 to the time of his death in his sixty-ninth year, he published numerous medical and philosophical papers. His most outstanding work was his book on "The Diseases of the Mind." (Demonstrated). This book contained many practical and original observations, and was a valuable contribution to psychological medicine. The observations of Dr. Rush on yellow fever were extensive and important. (Demonstrated). William Cobbett, of Philadelphia, published in that city a magazine entitled *Porcupine's Gazette*, and made vicious attacks on Dr. Rush in this magazine. Dr. Rush brought suit for libel against him and received a verdict against him of \$5,000. It was necessary to attach all of Cobbett's property in Philadelphia to satisfy this judgment, and Dr. Rush devoted the proceeds toward charity. Cobbett then moved his activities to New York, where he published a few numbers of a magazine

which was called *Rush-Lite* (Demonstrated), in which he continued his ridicule of Dr. Rush.

*The American Medical and Philosophical Register* (Demonstrated) was conducted for a period of four years from 1810-14 by Dr. David Hosack, and Dr. John Francis.

There followed the publication of the *Philadelphia Journal of the Medical and Physical Sciences*, the first volume of which was published in Philadelphia in 1820. It was edited by Dr. Chapman, Professor of the Practise of Physic and Clinical Practise in the University of Pennsylvania. In 1828 the name of the publication was changed to the *American Journal of the Medical Sciences*, under which it continued to the present day.

Your attention is called to the report of three cases of "Extirpation of Diseased Ovaria," by Dr. Ephraim McDowell, of Danville, Kentucky. This report appeared in *Eclectic Repertory* in 1817. (Demonstrated). Dr. McDowell is no doubt justly known as the originator of this operation. Dr. McDowell's work did not meet with immediate acceptance by any means. In fact, his opponents were so severe in their criticisms that they amounted to persecution.

A list of the graduates in medicine at the University of Edinburgh between 1758 and 1788 includes sixty-three Americans.

A number of the publications which have been demonstrated here belong to the Hennepin County Medical Library and others were very kindly loaned by Dr. Armstrong, Librarian of the Ramsey County Medical Society.

Dr. Edwin L. Gardner presented two reels of moving pictures of the "American Moose."

H. BRIGHT DORNBLASER, M.D., Secretary.

## Proceedings of the Minnesota Academy of Medicine

Meeting of January 13, 1932

THE regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, January 13, 1932. Dinner was served at 7 o'clock, and the meeting was called to order by the President, Dr. J. S. Gilfillan at 8 o'clock. There were 57 members present.

Minutes of the December meeting were read and approved.

Annual reports of the Secretary-Treasurer were read and approved.

The Academy voted to offer, through the Board of Regents, an annual prize of \$100.00 for the best piece of original research work of an undergraduate student of the University of Minnesota; the prize to be awarded by a committee selected by the Dean of Medical Sciences, one member of which committee shall be a member of the Minnesota Academy of Medicine.

The President appointed a committee to draw up resolutions on the death of Dr. H. Longstreet Taylor, who died January 2, 1932.

Upon ballot, Dr. C. N. Hensel of St. Paul and Dr. F. H. K. Schaaf of Minneapolis were elected to Active membership in the Academy.

Dr. Gilfillan then called the President-elect, Dr. J. C. Litzenberg, of Minneapolis, to the chair.

DR. LITZENBERG: I would be ungrateful indeed if I did not seize this occasion to voice my grateful appreciation of the honor you have shown me by electing me President of this Academy. Honors may be real or not, as the occasions indicate, but when one is elected to preside over a society of the character of the Minnesota Academy of Medicine by his intimate colleagues who know his faults, it is an honor indeed.

I am now pleased to introduce to you the retiring President, Dr. Gilfillan, who will give his President's Address on "Compulsory Sickness Insurance."

Dr. J. S. Gilfillan (St. Paul) then read his Address.

#### DISCUSSION

DR. E. L. GARDNER (Minneapolis): Is it coming here?

DR. GILFILLAN: I think quite surely within not too long a time it is going to come up for consideration. Of course the United States is different from Europe. Very likely it will come up in the states. Social insurance has already gone quite a ways in the United States; we see that in various lodges, industrial plants, etc. All these social insurance instances are predecessors of compulsory insurance, but I think it will be a long time before it is universally applied in this country. It will come up for discussion at least, but whether or not it will be accepted I don't know. The American Dental Association has investigated this quite thoroughly; they have raised funds and sent representatives to Europe to study the various systems over there, and they are quite ready for it. The medical profession should get in on it so that they will have something to say about the framing of the laws and the administration of the scheme. In Germany, it is probably more unsatisfactory than in any other country but of course Germany is very poor anyway and one can't apply that to the United States. I am quite sure that we will see the thing brought up and I think we should be prepared for it.

DR. H. B. ZIMMERMANN (St. Paul): In those countries in which the scheme is apparently quite satisfactory to the doctors, isn't that due entirely to their loyalty?

DR. GILFILLAN: It is due mostly to the organization, which has gotten in early enough. Another thing that helps a lot is the number of doctors. Norway, for instance, has one doctor to 1,900 population; so there it is easier to make it satisfactory than it would be in the United States where there is one doctor to every 750 population. The total income per capita is less if there are two or three doctors to support in place of one.

DR. C. B. WRIGHT (Minneapolis): This is an exceedingly interesting and timely paper. I regret that Dr.

Gilfillan did not have time to discuss the condition of the hospitals in these various countries. In Scotland, according to the best information I could get, the panel doctors are not permitted to do anything but the simplest emergency surgery. Cases needing operations and hospital care are sent to public hospitals. The staff of these hospitals do the necessary work without compensation. In Sweden and Norway I have been told the hospitals are under the control of the state and the men are employed full time, in most cases receiving very small salaries. In fact at one time the medical association had to raise a large sum of money to support doctors who would refuse salaries below a certain point. In England the only income the surgeons get from private patients is where the patient is operated on in the surgeons' nursing home.

In this country, if the present method of building hospitals to give free hospital and medical care to veterans of all wars is continued, we will have much the same situation as far as hospitals are concerned. The Veterans' Administration has recently outlined a policy calling for the building of over 100,000 hospital beds in addition to the some 42,000 beds which they now control.

DR. GILFILLAN: In Sweden there is no compulsory insurance but the medical society there is pretty tight and the number of doctors is quite low, about one to 2,800. Doctors are stronger when not too numerous. Sweden is under a voluntary system; but in Sweden the doctor himself cannot make a contract without the consent of the organization.

DR. A. E. WILCOX (Minneapolis): You spoke of Lloyd George as being the man who put over the system in England, and the act becoming a law before the doctors knew anything about it. From what source did the plan originate?

DR. GILFILLAN: In the first place a lay committee was appointed. But Lloyd George was really the man who put it over with the representatives of the insurance companies. The insurance companies had the scheme all framed before the doctors knew anything about it.

DR. R. E. SCAMMON (Minneapolis): It seems to me that the problem here presented is the one that we are always facing with regard to insurance and pensions. Everywhere we are trying to get too much for too small a contribution on the part of the insured. I once had occasion to take up an insurance plan with the President of a University and received a typical answer. He said, "There are two objections to your plan; first, it costs too much, and second, you are not providing large enough pensions." In practically all insurance plans we do not collect enough money and therefore we take it out of the profession; later somebody has to suffer.

I would like to emphasize also the point Dr. Gilfillan brought out about the number of practitioners, 750 individuals per practitioner in the United States. Last year I had occasion to figure out how fast practitioners were increasing. I discovered that they are increasing five times as fast as the population is growing, and that for every four men who were graduated from our own institutions, one from a foreign institution is admitted to practice.

DR. LITZENBERG: In 1918, in my address as President of the Hennepin County Medical Society, I warned the medical profession that the socialization of medicine was surely coming and the degree to which it comes would depend upon the control of it by the medical profession, by studying the situation and, as Dr. Gilfillan has indicated in his talk, by the profession taking control and have it governed by the profession and not have it forced upon us by lay agencies.

The meeting adjourned.

R. T. LA VAKE, M.D., Secretary.

SOCIAL INSURANCE

(Continued from Page 275)

the official language of the state of Illinois. (Approved June 19, 1923. L. 1923, p. 7.) Preamble. 177. (American language.) 1. Be it enacted by the people of the state of Illinois, represented in the General Assembly:

The official language of the state of Illinois shall be known hereafter as the "American" language.

(So much for administrative and legislative inefficiency. The next article will take up the judiciary.)

NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Dr. B. H. Haynes, formerly located at Butterfield, Minn., has moved his offices to Lewisville, Minn.

Cass County Medical Society have endorsed Dr. C. E. Elofson, Fargo, for coroner of that county.

Dr. Morris L. Cable, Minneapolis, was married this month to Miss Raleigh June Gross, also of Minneapolis.

Dr. and Mrs. Egil Boeckmann, St. Paul, have recently returned from an extended trip in the eastern cities.

Congress has authorized the expenditure of \$90,000 for a 25-bed hospital to care for Indians at Wagner, S. D.

Dr. and Mrs. J. A. Watson, Minneapolis, are spending several months touring Europe. They will return home in the early Fall.

Dr. C. A. Mann, Minneapolis, is at his office

again, after a trip to New Orleans to attend the meeting of the American Chemical Society.

Dr. William Duncan, Watertown, S. D., was recently married to Miss Katherine E. Peabody, daughter of Dr. and Mrs. P. D. Peabody, of Webster, S. D.

Dr. E. J. Winston, who has been in active practice for over sixty years at Cherry Grove, Goodhue County, Minn., died on March 25, at the age of 92 years.

Drs. F. L. Darrow, E. S. Watson, and C. E. Lowe, were the principal speakers at the March meeting of the members of the Aberdeen District Medical Society.

Funeral services were held for Dr. Walter J. Kremer, a member of the staff of St. Mary's Hospital, Minneapolis, April 4th. Dr. Kremer was 53 years of age.

A sixty bed addition will be made to the Veterans home at Hot Springs, S. D., at an expense of \$135,000 and one of forty-five beds at Fargo to cost \$65,000.

The new addition to the plant of the State Sanatorium at Ah-Gwah-Ching was formally opened last month. The improvements made cost a trifle over \$100,000.

Dr. Lincoln E. Penny, who has been a practicing physician in St. Paul for over forty years, died suddenly last month from an attack of hemorrhage of the stomach.

Ten doctors teaching in the University of Minnesota Medical School are attending the annual meeting of the American College of Physicians in San Francisco, this month.

Dr. L. H. Fligelman has been named chief of staff of the St. Peters Hospital at Helena, Montana. Plans were discussed for many new improvements during the coming year.

Fargo made an enviable health record in 1931. The city was recognized as one of the outstanding communities for its size in the country in matters of public health, according to an appraisal.

Dr. H. M. Waldren, Drayton, N. D., president of the North Dakota State Medical Society, was a guest speaker at the March meeting of the Cass County Medical Society held at Fargo.

Dr. J. D. Alway, Aberdeen, S. D., is off on a six months' vacation in Europe. Dr. Alway plans on several months' study at Vienna in the different clinics, in his special line of eye, ear, nose and throat work.

The new Owatonna, Minn., City Hospital was opened to the public this month and attracted thousands of visitors. The hospital is one of the most modern and best equipped for its size in that section of the state.

Dr. R. J. Errington, Fargo, N. D., who was recently convicted on a charge of practicing medicine without a license in that city, had the sentence suspended with the understanding that he leave the city and state at once.

Dr. John V. O'Connor, who has been in active practice in St. Paul for over 30 years, died on April 5th, after a short illness of a few weeks. Dr. O'Connor was a graduate of the University of Minnesota Medical School in 1895.

Dr. J. F. McClendon, professor of physiological chemistry at the University of Minnesota, is on his way to Japan where he will conduct research work in iodine and goiter as a visiting professor at Tohoku imperial university.

Dr. Harry Fortin, specialist in orthopaedics, has opened an office at Fargo, N. D. Dr. Fortin several years ago was associated with Dr. C. N. Callander of Fargo, but for the past few years has been on the Mayo staff at Rochester.

The Lewis & Clark County, Montana Medical Society, held their annual meeting last month at Helena, and elected the following officers: Dr. C. H. Barbour, president; Dr. E. H. Lindstrom, vice president, and Dr. B. C. Shearer, secretary.

A new solution, 17 times as powerful as liver and more than seven times as concentrated as any liver concentrate now available for the treatment of pernicious anemia, has been developed by Dr. William P. Murphy of the Harvard Medical School.

Another of the pioneer physicians was called recently in the death of Dr. Thomas Walker, of Riceville, Minn., at the age of 83 years. Dr. Walker was a graduate of Rush Medical School, and had been in active practice at Riceville for over forty years.

Dr. Fred Treon, Chamberlain, S. D., who has been seriously ill at his home, has been removed to Aurora, Ohio, his former residence, in hopes that he will soon regain his former good health and be permitted to return to his practice at Chamberlain.

Health conditions were good and cases of infectious or contagious diseases were few in Grand Forks during the 12-month period from March 1, 1931, to March 1 of this year, according to a

report to the city commission by Dr. E. C. Haagen, city health officer.

Louis Wiesskirch, who claimed that Sophia Weissgirch died as a result of being given an improper cancer treatment, was awarded a \$7,500 verdict in district court against Boyd T. Williams, former operator of a cancer hospital on University avenue in Minneapolis.

Talking pictures made under the supervision of Minneapolis physicians will be among 25 films dealing with medical and surgical topics which will be exhibited at the seventy-ninth annual meeting of the Minnesota State Medical association, May 23, 24 and 25 at St. Paul.

Warning that diphtheria cases have increased in 96 cities in the United States; the Minnesota Medical association has urged that all children be immunized. According to the state board of health, there was an increase of approximately 100 cases in Minnesota last year over 1930.

A very attractive and appropriate bronze plate was presented to the Naeve Hospital, Albert Lea, Minn., and has been erected in the reception room of the hospital as a special memorial to the late Miss Anna Kippen, former Superintendent of the hospital, who passed away in California last fall.

At a joint meeting of the Minneapolis District Dental Society and the Hennepin County Medical Society held in the auditorium of the Medical Arts building, two members of each group presented papers. Drs. Carl O. Flagstad and B. G. deVries, representing the dental society, and Drs. H. A. Reimann and J. A. Watson, representing the medical group.

Dr. M. C. Johnson, well known physician of Aberdeen, died on April 2 from a heart ailment with which he had been afflicted for many years. Dr. Johnson was 60 years of age, a graduate of Rush Medical College, and had always taken an active interest in the state and district medical societies. He was also a member of the Editorial Board of the Journal-Lancet.

Dr. F. H. Staley, one of the pioneer physicians of South Dakota for over 40 years, died at his Vienna home on April 2nd, after an illness of several months, having sustained a paralytic stroke early last January. Dr. Staley was a graduate of Rush Medical College in 1886 and was active in the different medical societies of the state. He was an ex-president of the Watertown District Medical Society.

The Hennepin County Medical Society will have as their principal speaker at their meeting on April 20, Mr. M. K. Kjolraug, his subject being "Public Relief Work in Minneapolis," and on April 27th, Drs. S. Marx White and Irvine McQuarrie, will make reports of their recent trip to San Francisco to attend the annual meeting of the American College of Physicians. Both meetings will be held at 1 P. M. sharp.

The 16th annual meeting of the South Dakota State Nurses Association will be held at Yankton, on April 21, 22 and 23. Speakers on the program are: Miss Mary M. Roberts, editor of the American Journal of Nursing; Albert Evans, director of Red Cross relief work in South Dakota and Nebraska; Dr. J. C. Ohlmacher, director of the state health laboratory, Vermilion, and Dr. G. S. Adams, superintendent of the Yankton state hospital.

Newly elected officers for the auxiliary to the Hennepin County Medical Society for the coming year include Mrs. H. J. Tunstead, president; Mrs. F. A. Erb, president-elect; Mrs. Emil S. Geist, first vice president; Mrs. Moses Barron, second vice president; Mrs. G. T. Nordin, recording secretary; Mrs. H. B. Sweetser, Jr., corresponding secretary; Mrs. G. G. Eitel, treasurer; Mrs. G. R. Matchan, auditor, and Mrs. H. W. Quist, custodian.

Our March 15 issue reported that "Dr. W. P. Thelen has moved from Wilton, N. D., to Stillwater, Minn., where he will continue in general practice." We were misinformed. The facts are that Dr. Thelen's health became such that he was forced to discontinue his practice. He has been resting at his former home near Stillwater, Minn., and attempting to overcome his ailment. He still has his home at Wilton, N. D., and will continue his practice there when his health permits.

Physicians taking an active part in the fight against tuberculosis joined Blanche La Du, chairman of the state board of control, and Dr. J. A. Thabes, Brainerd, president of the state board of health, in the formal opening of the new \$98,000 infirmary building recently completed at the state tuberculosis sanatorium at Walker, Minn. The new infirmary will accommodate 80 patients, and has facilities for emergency operating rooms, staff consultation room and library, and clinical examination rooms.

John F. Kroeten, 48 years of age entered a plea of guilty to practicing healing without a Basic Science Certificate before the Judge of the District Court at Duluth. The Judge sentenced the defendant to serve three months on the St. Louis County Work-farm. The court refused to suspend the sentence and as a result thereof Kroeten must spend the next three months on the Work-farm. Kroeten is an itinerant quack who has attempted to practice healing in St. Paul and Minneapolis without the "formality" of obtaining a license. He is a carpenter and painter by occupation. He claims to have obtained his knowledge in the healing arts from other members of his family. Kroeten was arrested on complaint of the State Board of Medical examiners and was confined to the County Jail until March 4th, because of his inability to furnish \$500 bail. Some of the ailments Kroeten claimed to be able to cure were varicose veins, running sores, blood poison, rheumatism and "cancer on the outside." This is the first prosecution for violation of the Medical Laws in St. Louis County in the past year and the Court by imposing a straight Work-farm sentence has made it very plain that quackery will not be tolerated in that County.



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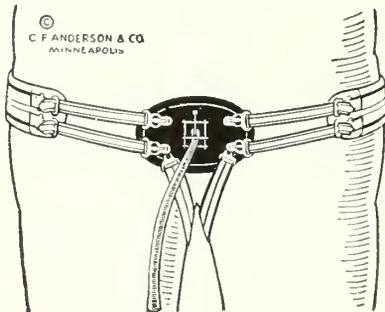
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## Foster Homes for Needy, Sickly Infants and Little Children

A Goal to Be Attained in the Future and Celebrated During  
"Child Health Week"

HENRY DWIGHT CHAPIN, M.D.

*New York*

**M**ARBLE halls, brick and masonry often fail to save the lives of children. The death rate among infants kept for unduly prolonged periods in the best institutions is strikingly higher than that noted for the general child population. This condition prevails throughout the civilized world, not as a result of improper care given the tender charges sheltered by institutions, but rather because of the insurmountable difficulties which are unavoidably associated with mass handling of children. The dangers are in direct proportion to the age of the child, being very great under one year, and diminishing as children grow older.

In an endeavor to correct this situation, in the year 1900 I devised the system now known as the Speedwell Plan, whereby young infants and children are placed in carefully selected and supervised foster homes, rather than being confined to institutions and hospitals for long periods. The beneficial results of foster home care as compared with that of the institution, measured in lives saved, has exceeded my expectations, yielding successes often unobtainable in the best hospital wards, even when dealing with extreme cases of malnutrition, rickets and general debility. The striking success of the Speedwell Plan has resulted in a steady growth of the organization; thus, at the present time it is composed of a central office and nine outlying sub-

sidary units, which provide a total of 270 beds. These units are composed of district groups at approved homes to whose care infants may be admitted under the constant supervision of a paid physician and trained nurse working in the district in co-operation with a group of interested women. The out-lying units, in turn, are under the direct supervision of the central station.

Under the operation of the Speedwell Plan, the homes to whose care the infants are entrusted are not the mansions of the wealthy, but are plain average American homes. The essentials required of the approved home include a loving, interested, conscientious foster mother who is willing and capable of complying with instruction given by the supervising physician and nurse. These foster mothers are paid one dollar daily for taking care of the babies entrusted to them, and a bonus is added in difficult cases. Additional expense includes furnishing clothing, feeding utensils, and one quart of grade A pasteurized milk daily. The total per capita cost of providing foster homes last year amounted to \$1.64 per day as compared with an average per capita cost of over \$7.00 for hospitals in New York City.

At the present time the Speedwell Society is caring for babies sent from forty-one hospitals throughout New York City, admissions being arranged through the Convalescent Service of the

United Hospital Fund of New York, in co-operation with the social service departments of these various hospitals. The infants are sent to the Society not because of the economy accomplished, but rather as a result of recognition of the fact that placing children in foster homes for convalescence saves many lives that otherwise might be lost. The belief of those in charge of these hospitals, therefore, coincides with the modern movement directed toward placing the needy child in a suitable foster home for convalescence, thereby giving it the best environment society can provide to promote restoration to health.

During the thirty-two years the Speedwell plan has been in operation health has been restored to many hundreds of children, which on the basis of years of institutional experience, I am certain could never have been accomplished without the help, interest, care and love of the foster mothers who have faithfully nursed these sickly little ones as tenderly as they would care for a child of their own.

Undoubtedly there are thousands of homes in America where a mother's love is great enough to envelope another baby if request is made and need revealed. Thus, without expenditure of funds for foundling hospitals, institutions, and convalescent homes, unexploited and unused facilities exist everywhere for the adequate care of

needy, weak, sickly, underprivileged infants and children, the use of which, I am convinced, will reap a large reward of lives saved. Realizing our responsibilities and opportunities, let us look forward, therefore, to the time when hospitalization of infants and children is terminated during convalescence at the earliest possible moment; when orphanages and foundling hospitals are emptied and when children's institutions are no longer needed. This end can be accomplished by providing foster homes where conscientious, individual care is available and where health and happiness abound, nurtured by a mother's love. Let us abandon the time-proved failure of herding infants and children in institutions, and our reward will be lives saved and health improved.

I am convinced that no greater forward step could be made in the direction of preservation of the health and lives of infants and little children than by the general adoption and use of the Speedwell Plan for providing foster homes, whereby a controlled environment can safely empty poor-houses and institutions into homes. This alone would stand as an appropriate monument of our accomplishments in the interest of the welfare of our children, and no doubt would serve as one of the goals to be reached eventually and celebrated by observing "Child Health Week."

## Maternal Instinct

ISAAC A. ABT, M.D.

*Chicago*

**T**HERE are those who deny that there is a maternal instinct. Watson, the founder and exponent of behaviorism, denies that such an instinct exists. But in all times, ancient as well as modern, and even among the lower animals, there exists a tenderness and interest for the new-born, call it what we may.

Maternal instinct has its psychologic and biologic aspect. Biologically it serves to protect the young against harm and provides for the perpetuation of the species. Psychologically it manifests itself as an intense feeling of love for the offspring. In human beings we think we can trace its evolution from a primitive animal reaction to a highly organized and most devoted affection. Since this intense devotion has not always existed in savage races in the form in which we know it now, we must assume that it has

been modified by the development of intelligence, the finer emotions, the social status—in a word, by the progress of civilization.

Scientists and biologists are not agreed as to the definition of instinct. McDougal would define instinct as a condition where certain innate specific tendencies of the mind, that are common to all members of any one species, assume the nature of racial characters! They have been slowly evolved in the process of adaptation of species to their environment. They can be neither eradicated from the mental constitution of which they are innate elements, or acquired by individuals in the course of their lifetimes.

Instinctive actions are displayed in their purest forms by animals not very high in the scale of intelligence. Instinctive action implies some definite behavior, some movement or train of move-

ments which is the same in all individuals of the species and on all similar occasions. The behavior is of a kind either to promote the welfare of the individual animal, or the best interests of the community to which he belongs, or to secure the perpetuation of the species.

There are other psychologists who are little inclined to credit instinct with high importance, but include that if it does exist, its presence depends upon the structural and functional nature of nerve centers and nerve paths. These functions or structures are inherited, and upon their presence a race habit has been produced. In the presence of certain stimuli, these performed and inherited tendencies or habits will come into play. Thus the mother instinctively responds to the voice and cry of the child and protects it, cuddles it and loves it.

We are, however, not so much concerned with the mere definition. Maternal protection, love, and care are realities, no matter by what name we call them. A recent writer would prefer to use other terms, maternal activity or child-caring complex, rather than maternal instinct, and he adds that this maternal solicitude is infinitely variable as it operates among different peoples or in different persons or situations.

It is true that through the ages many pernicious habits, superstitions, and bad traditions have become associated with child-rearing. These have had their origin among primitive tribes, peasant peoples, and in various groups. They, however, are not instincts. As we understand it, maternal instinct impels the mother to perform acts for the welfare of her child, either physically or mentally, through her natural involuntary impulses.

Maternal instinct is observed among the lower animals. Even among fishes we see this quality developed. Some species deposit their eggs in rude nests and watch over them, driving away creatures that might prey upon them. There are instances of insects who invariably lay their eggs where the grubs when hatched may find the food they need. The young chick runs to its mother in response to a call of peculiar quality and nestles beneath her.

We find among apes the most remarkable examples of the maternal instinct. In one species the mother carries her young, clasped in one arm for several months, never letting go of it in all her wanderings. This instinct becomes stronger in human mothers, in whom it becomes organized and intellectualized as the most important constituent of the sentiment of parental love. Like

other animals, the human species is dependent on this instinct for its continued existence and welfare. These impulses and sentiments are sometimes circumvented, and the maternal instinct becomes more or less diminished, and sets up habits which are incompatible with its highest realization. The preservation and cultivation of this maternal instinct is necessary for the survival of the race.

Maternal instinct is the most powerful of all instincts, and is accompanied by strong and definite emotions. It is shown by birds and domestic animals, and manifests itself in human beings as the tender feeling of parents toward their children.

There are various explanations for parental tenderness. Some have suggested that it may be attributed to the expectation by the parents of filial care in old age. This depends on the selfish thought of one's own welfare or pleasure. We cannot agree to this. Parental love is much more than this. It must appear an insoluble riddle and paradox unless we recognize this primary emotion, love for the offspring, as an ancient instinct of vital importance.

Conjugal love is not highly developed among some of the savage tribes even at the present day. The sentiment of love among uncultured people is feebly developed. For instance, it is said of the Eskimos, that like all other men in the savage state, they treat their wives with great coolness and neglect. Love in our sense of the word is said to be unknown to the North American Indian. If you speak of conjugal love to the men of these tribes it makes them laugh, says an experienced traveler. South American Indians are said to have no love for their wives. Travelers through the savage world find in West Africa, East Africa, New Zealand (among the Maori) that married couples behave as though they were not related at all.

While this lack of affection exists between the sexes in savages, the love of the primitive mother for her offspring is surprisingly great. Thus, among the Eskimos, among whom the coldness of the sex relations is conspicuous, maternal love is lively and tender. Among the North American Indians the mothers are devotedly affectionate to their children. Among the South American Indians conjugal affection, it is reported, does not exist, but the maternal love for the children is very tender. In Patagonia both parents seem to be devoted to the children and will undergo the greatest privation to satisfy their wants. It is reported that upon the wish of a child whole

tribes have been known to leave a district or to remain there longer than was advisable simply to gratify the whim of the child.

In spite of the feminine tenderness among savages and primitive people, infanticide has been practiced in ancient as well as in modern times. It is difficult to reconcile these primitive practices with love and tenderness which should be associated with maternal instinct. In the long trail of years that have elapsed from the savage state to civilization, there has evolved a change in morals which has gradually brought us to our present-day standards. In ancient society child sacrifice was sanctioned by custom. The weakest, the very young, and the very old were disposed for economic or sacrificial reasons.

The practice of infanticide is still very widespread among the present day savages. Infanticide is also practiced among many of the lower animals. It is perpetrated early in the life of the new-born, in the human as well as the animal world. It may be presumed that immediately after birth no bond of affection has been established between mother and offspring. Consequently the killing is comparatively impersonal. Death and the sacredness of life are not thought of in the same manner in primitive as in civilized society; the killing of children, like the killing of older people, may often be done with the most tender feeling and kindly sentiment toward them.

The Patagonians who are very affectionate toward their children decide directly after birth whether the child is to live or die. If allowed to live he becomes at once the object of his parent's unbound solicitude. American squaws sometimes destroyed their female children in order to spare them the arduous life which their mother had to lead. The Arabs practiced infanticide because of their love for their daughters in order to shield them from poverty and dishonor.

Maternal love among primitive mothers is much fiercer and more unreasoning than among civilized mothers. The maternal sentiment in them is much more simple, primitive, and fundamental than the mating instinct. The females feel a repulsion toward the male after birth of the child. It should not be forgotten that the primitive mother, apart from her maternal instinct, is a wild creature without the fine characteristics which we recognize in modern society as feminine gentleness. When we think of our barbarian ancestors in the terms of history and ethnology, we must realize the many changes in morals and intelligence which have occurred

through the long ages in our progress to civilization.

Maternal instinct has not always been what it is today. It has advanced to its present state along with the finer emotions, greater tenderness, and gentleness as the result of intellectual development and refinement of manners.

The maternal instinct has varied from age to age. We think we have observed this even in our own lifetime. Three to four decades ago a large family of children was desired. Indeed, the more children, the higher the family was esteemed. Today, for economic or social reasons, we find families limited to one or two children. Perhaps this may be explained on the ground that quality is more desirable than quantity; perhaps to the complications of our modern life, since the rearing and education of children has become more difficult and exacting than in former years. Whether this change implies a variation in our attitude toward family life and love of children, or whether it is due to the economic stress and strain of modern life, it is difficult to decide.

Not infrequently the modern mother adopts one or more children because of her great desire, and we may assume also, because of her strongly developed maternal instinct. In cases of adoption, the parents love these children with as great a warmth and tenderness as if they were their own. This shows that the feeling of parental love may go out towards children who are not natural offspring, and illustrates the fact that love may go out to those who are weak and helpless, giving the mother an outlet for the exercise of her maternal instinct.

Maternal instinct is also displayed by female children of tender age, as is shown by the girl scarcely out of her cradle who fondles dolls and presses them to her in imitation of her mother. She bathes, dresses and fondles them with loving care. Thus early in life the female child evinces maternal instinct. The little boy may also do this for a short time, but very soon scorns the doll and turns to the more masculine games.

Thorndyke says that all women possess from early childhood to death some interest in human babies, which becomes intensified after childbirth. A mother recently asked me whether maternal instinct was not growing less among mothers of the present day. When I asked her for the answer, she replied that since childbirth had been made so easy by the modern refinement of obstetric practice, it had lost its sting and its pain and mothers had less to remind them of the or-

deal. This may or may not be a factor, for we are not prepared to say that maternal instinct has diminished throughout the civilized world, nor do we know whether instinctive love depends upon preceding pain.

Modern life presents many distractions which carry the mother away from the home. She seeks diversion, entertainment of various kinds, and intellectual advancement. There is so much literature on puericulture from the physical and the mental side that even the most intelligent mothers are confused by the complex array of advice and directions. Child care varies from season to season as the fashions in attire change.

We are told in the popular literature that infants and children should have the right to liberty of thought and of action. Child guidance often becomes misguidance. We speak glibly of the problem child; is he suffering from repression, the inferiority complex, the oedipus complex, the father or mother fixation, behavioristic disorders, and should we have him psycho-analysed? The distracted mother, following the fashion of the day takes a course of lectures on child training or joins a club for the education of parents while her own child is at home with an inferior or tired nurse, breaking the bric-a-brac, or violating all the rules of child training, of physical and mental hygiene, and crying out aloud in the desert for maternal love and tenderness.

What is learned in the psychological laboratory or in the realm of research concerning groups of children may not apply at all to the individual child in the home. Not every nurse is so endowed that she can substitute for the natural mother. Any child may require medical examination or even psychiatric testing; but that is an individual problem and requires individual investigation and sane advice.

One of the striking advantages in the old-fashioned family was that the older child helped with the household duties and in the care of the younger children. She soothed them when they cried. She learned to warm the bottle and to hold it for the baby. She observed how the food was prepared. She watched the mother dress and undress the baby, bathe it, and care for it when it was well and sick. In other words, the care of a baby was not a novelty to the older child. Her maternal instinct was early aroused and trained.

Perhaps in our present state of society we might obviate some of the difficulties in which young mothers find themselves if young girls were in some way educated for motherhood. For

after all, the great contribution of woman to civilization is the making of a home. It is apparent to every one that maternal instinct is not sufficient in itself to make the home a delight and a safe and happy dwelling place for the infant. Every girl of high-school age should have a course of training in the hygienic and aesthetic principles for the planning of a home and the conduct of a household, and also the first principles of domestic science. She should also learn the principles of hygienic care and the education of normal children. Some sensible, everyday talks on the duties of a mother before and after the birth of a child would be valuable, and in addition, if she learns something about heredity and eugenics she might possibly display discretion before selecting her life companion.

In some instances maternal instinct may be perverted, or may not be sufficiently developed to serve as a correct guide to the mother for the care of her infant. It is probably normal and desirable that a mother should show some anxiety for her new-born infant. In some instances, however, this anxiety becomes so exaggerated that her judgment is clouded and her interpretations of the child's reactions are erroneous.

If the child cries normally and naturally the mother thinks that he is ill; she fears to bathe the baby because she cannot trust herself to prepare the bath water at the proper temperature. She fears to take the baby's temperature for fear of injury. She cannot nurse the baby at the breast because it gives her slight pain, or she feels that he is receiving too little or too much food. These mothers sleep poorly at night; they awaken suddenly and are alarmed lest something has happened. They listen to the breathing and feel that all is not well with this function. Consequently, they awaken the infant from his sleep with excessive demonstrations of anxiety and affection. They compare the record of their baby with that which is written in the books. When the child's record does not exactly agree with the specifications in the manual, the mother is very much disturbed. She has developed a maternity neurosis.

When we ask why mothers are so frequently upset and nervous about the care of their young infants, the answer may be found in the fact that mother love, which develops shortly after birth and with the nursing period becomes the dominating influence of her life as a result of this intimate association with the infant and overrules all other influences. One author thinks that mother

love is not the predominating feeling immediately after birth. In some there is a temporary indifference. After she has recovered from the shock and pain of her labor and has begun to take the baby to her breast, the latent instinct of maternal love manifests itself.

For the proper physical and psychic development of the child it is necessary that it be given true love and affection; and this it receives in nearly every case where the normal maternal in-

stincts have not been perverted or suppressed by mental, physical, or social ills. Just as the plants need the sun for normal growth, so the child requires loving care for its psychic development. Every baby is entitled to individual personal attention. There can be no substitute for the loving care of the mother. Maternal instinct provides for this, and under normal conditions the mother's natural devotion makes her baby the object of her greatest love.

## The Responsibility of the General Practitioner in the Community Child Health Program

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OF ALL the individuals and agencies concerned with the health of the children in any community, none, except possibly the parents, has greater responsibility or wider opportunities than has the general practitioner. He can, if he will, play an important part in efforts to bring about the ideal set forth by President Hoover in The Child's Bill of Rights; namely that there shall be no child in America:

1. That has not been born under proper conditions.
2. That does not live in hygienic surroundings.
3. That ever suffers from undernourishment.
4. That does not have prompt and efficient medical attention and inspection.
5. That does not receive primary instruction in the elements of hygiene and good health.
6. That has not the complete birthright of a sound mind in a sound body.
7. That has not the encouragement to express in fullest measure the spirit within, which is the final endowment of every human being.

The general practitioner will do everything in his power to give adequate pre-natal, delivery and post-partum care to the mothers in his private practice, but he can do more than just that. He can assist with the organization or at least sponsor the organization of classes for the instruction of mothers in pre-natal, and early infant care. He can make as wide use as possible of the state publications on maternal and infant care. He can keep himself informed on and take

advantage of the services available from the state department of health and from other official and non-official organizations. He can give counsel, guidance and assistance to the local public health nurses in all matters pertaining to maternal and child hygiene.

It is a well-known fact that the general practitioner is not, as a rule, apt to think in terms of public health. Very often he could show more interest in and work more in sympathy with the local Board of Health. The interested physician will keep himself informed on state requirements for community sanitation and help to see that these requirements are met. Pure milk, pure water, measures for the control of communicable diseases, methods of sewage disposal and the control of insect breeding places are all of vital importance to the health of the community. High standards must be maintained in order to safeguard the people's health. By sympathetic support of the local health authorities the physician can help to insure that really effective work is done in the field of sanitation.

Adequate nutrition is of special importance in times of economic stress. The physician can do much by instructing the parents of every child under his care in the principles of child feeding. He can encourage breast feeding as the most satisfactory method for all infants, and can stress the beneficial effects of sunshine on nutrition at all ages, but especially during infancy and early childhood.

It is, of course, to the interest of the community that each child should receive adequate medical

care, including periodic health examinations. Here, too, the general practitioner can co-operate with the public health department and the county commissioners to provide such medical care for the under-privileged. Moreover, he can do much to lessen the possibility of epidemics in the community by urging immunization and vaccination for all children. It must not be forgotten that the responsibility of the general practitioner in the community child health program, extends beyond his own private patients, to include the organization of adequate facilities for those under-privileged mothers and children who must be treated at the public expense. While he gives much of his time and service to the treatment of those who cannot pay, he does not always organize or systematize his services to these patients. Through his county medical Society and local Board of Health he can do much to help organize and develop local facilities for the systematic health examination and adequate medical care for the under-privileged.

The need for primary instruction in the elements of hygiene and good health suggests co-operation with the school medical service, which is largely educational, and in the homes of such children as come under his immediate care. The physician can bring much weight to bear on the importance of early home training in health habits, and by his interest and actual assistance, where possible, can help to insure properly graded health education of the school child in health habits, health attitudes and the general principles of hygiene. In connection with this last, he can also use his influence to encourage the adequate

health education of teachers in training schools and colleges for teachers, for it is obvious that unless teachers themselves are adequately trained in matters of health education, they cannot pass on their knowledge effectively to the children in their care.

The birthright of a sound mind in a sound body depends largely on adequate pre-natal, natal and post-natal care and suggests methods of co-operation mentioned above in connection with maternal and infant care. It admits, however, of participation on a wider basis, as for instance, an active interest in stimulating, encouraging and assisting in every way the institution and development of adequate recreational facilities in the community.

But preventive measures and remediable service alone are not sufficient. Besides his claim to physical health each child has a right to self expression and a fair chance to develop to the fullest possible extent the powers that lie within him. Here, too, the practising physician can help, particularly among the handicapped children of the community, by giving medical care and by assistance in prescribing the amount and kind of work and training which the individual child's handicap will permit.

Every clause of the Child's Bill of Rights cries out for active co-operation and leadership on the part of the general practitioner. No community program for the health and protection of children can possibly be perfect, or even as good as it might be, until the general practitioner accepts the responsibility and leadership which his position and knowledge entail.

## The Diagnosis and Treatment of Infections of the Urinary Tract in Childhood\*

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THE diagnosis of infections of the urinary tract in childhood is usually determined by examination of the urine. Simple as this seems, certain mistakes are likely to be made when the presence or absence of infection is to be determined. In the early stage of the infection pus may be absent from the urine, and the innumerable bacteria present are not recognized as evidence of the illness. The presence of even

large amounts of pus in the urine is not conclusive evidence of infection of the urinary tract. The pus may come from the vagina or prepuce. I have made it a rule, in dealing with male infants, and with girls of all ages, never to make a diagnosis of pyelitis without obtaining a catheterized specimen. In dealing with older boys, the foreskin may be retracted, a small amount of urine passed and discarded, and then a specimen caught.

The presence or absence of infection can be de-

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terminated in this way, but it is also essential to know the nature of the infecting organism. The presence of streptococci or staphylococci is presumptive evidence that the kidney has been secondarily infected by way of the blood stream, and foci of infection in skin, tonsils, ears, and so forth should be looked for. The presence of the colon bacillus indicates that the infection is much more likely to be of the bladder or of the pelvis of the kidney, with or without involvement of the renal parenchyma. Enlargement of the kidney, and illness of extremely severe course, always indicated pyelonephritis. Absence of any growth after forty-eight hours on blood agar plates made from urine that contains pus, makes it necessary to exclude an infection due to the bacillus of tuberculosis, and stains for identification of this organism should be made immediately. The very exceptional case may be due to streptothrix or an anerobic streptococcus.

After a diagnosis of pyuria has been made, and microorganisms have been identified, the further steps will depend on the nature of the case. If the case is an acute one, a primary attack, it is probably not necessary to attempt further diagnostic procedures, except to exclude possible renal impairment by means of determinations of the blood urea and the return of phenol-red. In chronic cases or in cases of recurring type, it is advisable to make a more complete examination, which includes, in addition to chemical and microscopic examination of the urine and culture of the urine, determination of blood urea; estimation of phenolsulphonphthalein; roentgenograms of the kidneys, ureters, and bladder; determination of residual urine, and a cystogram. In addition, a careful search for foci of infection should be made. If all of the tests prove negative, it is advisable to proceed with the usual treatment, and to give it a trial of two or three weeks before attempting to perform cystoscopic examination or ureteral catheterization, or to take a pyelogram. An intravenous pyelogram may be made with advantage at times.

Complete urologic examination is made to determine the presence of an abnormality in the urinary passages which may be present in the form of a stone, a diverticulum, cicatrix, a kink, a valve, a stricture, or lack of proper nervous control of any part of the urinary tract from the pelvis to the meatus.

Different observers do not agree about the length of time treatment should be given before search for abnormalities of the urinary tract should be instituted. I feel that two to three

weeks is long enough in cases of chronic infections and five weeks in an acute case.

The presence of persisting infection cannot be determined unless cultures are taken at intervals to determine the results of treatment. Clinical cures, evidenced by freedom from symptoms and absence of pus from the urine are not sufficient. This fact is to be stated most emphatically. Diagnosis should be made by culture and recovery should be controlled by culture.

The treatment of acute pyuria in infancy and childhood consists first and foremost in an attempt to wash out of the upper part of the urinary tract as much infected material as is possible. Alkalinization of the urine has been practiced widely, in addition to administration of fluids by mouth, by rectum, into the peritoneal cavity, into the muscles, and into the veins. Whether alkalinization is of any value has never been definitely proved. Its effect on the growth of the infecting organism is nil; a soothing effect on the inflamed mucous membrane has been assumed, but never proved. Clark recently has shown that patients with cystitis, causing marked pain, irritability, frequency, and tenesmus, are markedly benefited by increased acidification of the urine to a pH of 5.2 to 4.8. It is known that the colon bacillus grows with almost maximal intensity at the highest pH that can be attained by alkalinization. The effect of acid on the colon bacillus is very much more evident, at a pH that can be readily attained by medication. The pH of the urine can be established at 5.0 with moderate doses of ammonium chloride, and although only exceptionally has an organism been found that is inhibited completely in its growth at this pH, the growth is slowed up considerably, and cures have been reported with a urinary pH that has not reached lower levels.

The administration of large amounts of fluid, and the bringing about of a urinary acidity sufficient to inhibit bacterial growth make an ideal combination, during the acute stage, with which to wash out the passages and prevent further growth of organisms in them.

In the more chronic cases my experience indicates that methenamine, used under controlled conditions, offers better chances of success than any of the other urinary antiseptics. Gillespie has recently studied the bactericidal effect of Pyridium and Serenium, two newly introduced urinary antiseptics, and has not been able to show that they would be likely to be of any value in the treatment of infections with the colon bacillus. Experiments with methenamine *in vitro*, have shown that the degree of acidity is of utmost im-

portance in successful treatment. Without accurate control of urinary acidity, methenamine may be of no more use than so much water. At a pH of 6.0, and with a concentration of methenamine of 0.5 per cent, not enough antiseptic power developed in urine to kill the colon bacillus after twenty-four hours, but at a pH of 5.0, and one-tenth of the concentration just named, all organisms were killed within that time, and the same concentration rendered the urine sterile in six hours. By means of methyl red paper, which turns bright red at a pH of 5.5 and below, it is possible to determine whether urinary acidity is sufficient to split methenamine rapidly enough to produce bacteriostasis or even bacteriolysis in six to eight hours. Whether this suffices to clear up the infection, only trial will tell. If it will not, it is probable that urinary stasis is present in the system, and the cause of the stasis should be determined, if possible, by complete urologic examination.

The following routine should be carried out in the use of methenamine. Ammonium chloride should be given in increasing doses beginning with from 5 to 15 grains, four times a day, every six hours, the dose depending on the age of the child, until the urine turns methyl red paper a definite red. Then, methenamine should be given in increasing doses, beginning with from 2 to 5 grains, four times a day. After three days of treatment a culture of the urine should be taken. If the culture is sterile, the same dose of methenamine should be continued for three days more, and culture repeated. If the culture is again sterile, medication should be discontinued and after three days, again a culture of urine should be made. If the urine is sterile this time, the patient has been freed of his infection. If there

is growth in the last culture, treatment has sterilized the urine temporarily but has not cleared up the infection, and treatment must be repeated. If there was growth in the first culture of urine, the original dose should be doubled, giving 4 to 10 grains four times a day, and this dosage should be continued for three days. The acidity of the urine should be ascertained by means of methyl red paper. If a negative reaction is obtained, the dose of ammonium chloride should be increased. If culture of urine is sterile after three days of increased dosage, 4 to 10 grains should be continued, four times a day, for three days. If culture then is negative, medication is stopped, and the culture repeated after three days have elapsed. If the urine does not become sterile, the dosage is increased to three times the original dosage. This rate of increase is continued until either the urine becomes sterile, or until it is necessary to discontinue the use of methenamine because of frequency and hematuria resulting from irritation of the bladder.

Treatment of urinary infection by methenamine is successful only if the proper conditions are carefully maintained. The drug acts rapidly, and cure is often a matter of days rather than of weeks or months. The urine must be controlled bacteriologically at least once every three days, and the dosage regulated accordingly. Two negative cultures taken respectively three and six days after discontinuation of use of the drug are necessary before a patient should be dismissed as cured.

The ketogenic diet has recently been successfully used at The Mayo Clinic in treatment of urinary infections. Its application in private practice is still delayed by the difficulty of arranging for an accurately weighed diet in the home, without the help of a trained dietitian.

## Acute Catarrhal Jaundice

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**A**CUTE catarrhal jaundice is a misnomer but remains the best title for jaundice due to an acute degenerative process in the liver with edema and cloudy swelling of the parenchymal liver cells. Most cases are probably due to infection, but in the individual case it is usually not possible to determine either the nature or the location of the infecting agent.

Investigations in the last two decades, have

conclusively shown that bile pigment is formed not by the parenchymal liver cells, but by reticulo endothelial cells throughout the body. In the human, these cells are most numerous in the spleen, in the bone marrow, and in the liver itself; in the liver they are also known as Kupfer cells. The bile pigment formed in or by the reticulo endothelial cells is excreted through the parenchymal liver cells into the bile ducts.

Thus it comes about that we may have three types of jaundice, first, that due to an overproduction of bilirubin, a production too great and too rapid for the excretory ability of the parenchymal liver cells, this is hemolytic jaundice. Second, by failure of the liver cells to excrete bile as in catarrhal jaundice, this is intrahepatic jaundice. Third, as the result of obstruction of the biliary passages as in jaundice due to a stone in the common bile duct, this is obstructive jaundice.

More modern methods of measuring the amount of bile pigment in the blood stream are furnished by the Van den Bergh test, which not only gives a measure of the bilirubin in the blood, but also helps to distinguish between obstructive and hemolytic jaundice, and by various colorimetric tests, of which that for determining the so-called Bile or Icterus index is, I believe, the simplest and most practicable.

Cases of catarrhal jaundice vary greatly in severity. Unquestionably the great majority are mild and without serious after effects, but one cannot prognosticate a benign course because of a mild onset.

The more severe cases in addition to malaise and depression may show glycosuria along with a low blood sugar, in other words a diminution in the capacity of the liver to store glycogen. The writer recently treated such a patient, who repeatedly had attacks of unconsciousness lasting in one instance for 4 hours, from which she was only aroused by the par enteral administration of large amounts of glucose.

Bile Index determinations show that the period of recovery from catarrhal jaundice is usually prolonged for at least a month after the jaundice is no longer manifest in the skin, sclerae or urine. In the writer's experience, the usually lightly considered jaundice has more frequently led to catastrophe, than has a somewhat analogous condition in the kidney, the more dreaded post scarlatinal nephritis. He has records of an unfavorable outcome in four cases, two resulting after a few weeks' illness in Acute Yellow Atrophy checked at autopsy, and two in Laennec's Cirrhosis in which both of the diagnoses has been confirmed by Biopsy.

The writer believes then, that Catarrhal Jaundice represents serious damage to the liver, and that it requires serious treatment. The patient should be quiet, comfortable, and protected from changes in temperature. If there is evidence of impaired liver metabolism, his protein intake should be reduced to at least no more than his minimal protein need, and in severe cases should be entirely omitted for a few days. His carbohydrate should be given in the form of glucose solution, and should be given in small amounts every half hour or so in the day time, with longer intervals at night. These patients are made worse by insulin. Fat can be given, but in the writers experience the stools of children receiving fat, have been less foul if capsules of oxbile were given with and after meals.

## Prevention of Contagious Diseases

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THE marked progress in the prevention and treatment of contagious diseases of childhood in the past fifteen years has been due to two factors; research leading to discovery of safe and efficient agents for immunization and education of the laity by physicians to utilize and apply these discoveries. It has become the custom of pediatricians generally to urge active immunization against diphtheria of infants, between the age of seven and twelve months. Consequently there has been a striking drop in the mortality from this disease in the past eight years. Nevertheless, in the registered area of the United States, there were 7,585, or 6.6 per 100,000,

deaths from diphtheria in 1929. In Minnesota for 1929, there were 1,124 cases of diphtheria with 65 deaths. Many of these occurred in rural communities and among patients of general practitioners who have not sufficiently emphasized the importance of immunization. The family physician, therefore, has a responsibility, too often neglected, in urging protection against contagious diseases in infancy and childhood.

The public is being educated to preventive medicine along these lines through reading articles in the various popular magazines and in the health columns of the daily papers. Only too frequently, however, even when parents ask about

the advisability of such procedure they are met with indifference or lack of enthusiasm on the part of their physician. The aim of this paper, therefore, is to summarize the present status of the various immunizations with regard to their efficiency, dangers and technic of administration.

*Small-pox Vaccination*—When properly performed to leave a visible scar, small-pox vaccination is conceded to be an almost certain preventive against the disease for from seven to ten years. On account of lack of government compulsion, such as exists in many European countries, and the memory of severe vaccination reactions in the past, which were due mainly to secondary infections, many parents are reluctant to have their children vaccinated except during a small-pox epidemic. As a matter of fact, the younger the infant is vaccinated the milder is the reaction; this is an additional argument for early vaccination. During the epidemic of 1924, it was customary to vaccinate new-born infants. The absence of general reactions, as evidenced by high temperature and gastro-intestinal upsets, at this age was striking. There has been a marked improvement in the technic of vaccination since 1924, which almost eliminates secondary infections and results in a small inconspicuous scar. The skin over the deltoid muscle above its insertion or the lateral aspect of the thigh is sterilized with ether and thoroughly dried; a drop of vaccine is expressed and with a sterile sewing needle five or six punctures are made through the vaccine. If the skin is held taut with the left hand and the needle is inserted parallel to the arm, intracutaneous puncture over an area of  $\frac{1}{2}$  cm. is possible. The procedure should not draw blood as this washes out the vaccine and cuts down the percentage of "takes." After five minutes the excess vaccine is wiped off with sterile cotton; no dressing, shield or other covering should be applied. Most severe reactions and delayed healing of the vaccination wound are due to adherence of the dressing or shield with secondary pyogenic infection. In a successful "take" a papule appears in four to six days, becoming vesicular twenty-four to forty-eight hours later. The area of erythema around the vesicle increases in size up to the tenth day following vaccination, when the reaction is at its height. From then on the inflammatory area steadily decreases and in from two to three weeks a firm scab forms over the point of the vaccinated area; if not scratched or prematurely removed, this automatically drops off in three to four weeks, leaving a dry healed scar. In infants from seven

months to one year very little discomfort is experienced other than occasional irritability. Older children and adults frequently react with a high temperature and malaise for three to five days, during the height of the process. The patient should be instructed to report to the physician one week after the vaccination. If no "take" has occurred at that time the procedure should be repeated. Failure to obtain a successful "take" is due to (1) impotent vaccine, (2) improper technic, (3) immunity. The presence of immunity is shown by an area of erythema appearing in twenty-four to forty-eight hours and disappearing in twenty-four hours without leaving a scar. Occasionally young infants, who have been breast fed, will show such an immune reaction; but since this natural immunity is only temporary, the vaccination should be repeated in six months. Frequently one successful vaccination in infancy remains effective for life, as subsequent vaccinations will give an "immune reaction." The only contra-indication to vaccination is an acute or weeping eczema or other generalized skin lesion, because of the danger of general vaccinia from scratching.

*Diphtheria Immunization*—Children between one and four years of age are universally susceptible to diphtheria. Between these ages it is particularly dangerous, due to the high incidence of the laryngeal form, which is frequently not recognized by the mother or physician early enough for effective treatment. Consequently active immunization should be urged in all children between seven and twelve months of age. One of two preparations may be used. Toxin-antitoxin is given in doses of 1 c.c. hypodermically once a week for 3 doses. In children under twelve we have never seen either a general or local reaction; occasionally in adults a local erythema is noted for one or two days following inoculation. Permanent immunity is usually established in from four to six months after the last dose, as shown by a negative Schick test. Caution should be used against freezing the toxin-antitoxin with possible disassociation of the components and resulting reaction. The single objection to the use of toxin-antitoxin is the sensitization of the individual to horse serum with the possibility of anaphylactic reaction if it later becomes necessary to give horse serum for tetanus, meningitis, etc. For this reason the use of toxin-antitoxin is being superseded by the use of "toxoid." In this preparation the diphtheria toxin is partially neutralized with formaldehyde instead of with antitoxin. Toxoid has an addi-

tional advantage in producing somewhat earlier immunity. The dose is 1 c.c. hypodermically at three-week intervals for 2 doses; in children under two no general or local reaction occurs. In older children a local reaction sometimes results; hence, it is better to give  $\frac{1}{2}$  c.c. at 10-day intervals for 2 doses and 1 c.c. for the last dose if no reaction has occurred.

It is neither necessary nor advisable to Schick children under six years of age preparatory to diphtheria immunization as the percentage of immunity is negligible. In children over six, a preliminary Schick test will eliminate those already immune. However, it is most important that every child immunized by either method be given a Schick test from three to six months after the final inoculation. A small percentage of children will be found to have a positive Schick and should, therefore, be given another complete series of immunization, followed by another Schick. Once a negative is obtained the immunity lasts for the lifetime of the individual. The technic of the Schick test is as follows: the skin of the forearm is sterilized with alcohol. With a tuberculin syringe and a fine gauge hypodermic needle, 1/10 c.c. of Schick material is injected intradermally. Care must be taken to inject the material into the upper layers of the skin and not subcutaneously. The needle is inserted superficially, holding it almost parallel to the arm so that a wheal about 1 c.m. in diameter is produced. The test is read in four days. Absence of any reaction at this time indicates a negative Schick. Any erythema, however slight, should be interpreted as positive. Pharmaceutical houses now dispense a prepared, properly diluted Schick material which remains potent for several months.

*Scarlet Fever*—The preparation of toxin for immunization against scarlet fever has not yet reached the perfection enjoyed by the preparation for diphtheria immunization. Although scarlet toxin is available, it is necessary to give very large doses to offer any hope of immunity; as a rule five or six inoculations at weekly intervals. The reactions in many cases are severe and are both local and general. If it is used parents should be warned of the possibility of reaction and promises as to the duration of the immunity should be guarded. At present the policy of most pediatricians is to give scarlet toxin only upon request, but not to recommend it until they have more assurance of its effectiveness. In cases of severe scarlet fever with marked toxemia, scarlet fever antitoxin, corres-

ponding to diphtheria antitoxin may be administered. If given intramuscularly within the first three days, the effect is a rapid fall of temperature, disappearance of the rash and improvement in the general condition of the patient. After the fourth day of illness it has very little effect. As there is no evidence that scarlet fever antitoxin prevents complications its use should be confined to severe toxic cases.

*Measles*—Measles is still one of the serious diseases of childhood, because of the mortality from its complications; broncho-pneumonia, otitis media and mastoiditis. Its effect may also be serious in a child with a tuberculous focus which is not entirely healed, causing an extension of the tuberculous process. In cases of known exposure of infants, debilitated children or those known to have a tuberculous infection, it is advisable to give 10 to 15 c.c. of serum or 30 c.c. or more of whole blood obtained from a parent or other individual who has had measles. This is given intramuscularly, usually in the pectoral muscles. Given from one to five days after exposure, the development of the disease is usually prevented. If given from five to eight days after exposure, the disease will be greatly attenuated. As the duration of the protection from the serum is probably only for several weeks, it is usually advisable to give it about six or seven days after exposure, so that the child will have a light case of measles, thus receiving permanent immunity.

*Poliomyelitis*—To date no certain preventive agent against this disease is known. The mode of transmission is also undetermined, although most of the evidence points to spread through direct contact with mild cases or through the agency of immune carriers. Experiments and statistics have shown that from 80 to 90% of adults are immune and that serum obtained from pooled adult blood will protect susceptible monkeys against inoculation with poliomyelitis virus from active cases. Dr. J. Charnley McKinley, of the University of Minnesota, has suggested the advisability of wide spread administration of pooled adult serum, or a combination of mother's and father's serum, to children at the beginning of an epidemic. It is the practice at present to treat definite early or suspicious cases with serum obtained from old or recent cases of poliomyelitis. It is believed that early administration of immune serum may prevent the development of paralysis, and as no specific remedy exists, its use is recommended in all suspicious cases during an epidemic. Until more statistics

are available it is impossible to determine with certainty the actual value of immune serum, since in every epidemic undoubted cases receiving no treatment whatever recover completely without paralysis. During the epidemic of 1931, the Minnesota State Board of Health dispensed immune serum, gratis to physicians, for use in definite or suspected cases of poliomyelitis. Dr. O. McDaniel is at present collecting data on all known cases in the State, including those who received convalescent serum. When these, as well as statistics from the Country as a whole,

are evaluated we may have a better idea of the true value of immune serum in the treatment and pervention of poliomyelitis.

*Summary*—The status of immunology with reference to the contagious diseases of childhood is reviewed. At present prolonged or life-long immunity can be given against only two, diphtheria and small-pox. Physicians are urged to recommend and emphasize immunization against diphtheria and vaccination against small-pox of all children between seven and twelve months of age.

## The Treatment of Epilepsy in Children\*

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**A**LTHOUGH man has grappled with the problem of epilepsy at least since the beginning of written history, the disease still remains a source of frequent embarrassment to those who are called upon to treat it. The severe epileptic is one patient whom most doctors willingly transfer to a colleague. To be sure, the modern medical practitioner possesses therapeutic resources which are decidedly superior to the magic invoked by his confrere of bygone days, or that are in current vogue among the laity, but we are forced to admit that complete cure is a phenomenon so rare in its occurrence as to arouse great wonder in the mind of the observer. The chief reason for this predicament is, in all probability, our lack of knowledge regarding the underlying pathogenesis of the disease. Just as every imaginable form of therapy from incantation to extirpation has been resorted to without striking success, so guesses regarding etiology have ranged from "possession by evil spirits" to congenital malformations of the skull or dysfunction of the ovaries, without advancing our real knowledge materially.

### PATHOLOGICAL PHYSIOLOGY OF EPILEPSY

While detailed discussion of etiology is beyond the scope of the present paper, a brief reference to the subject will serve as a point of orientation for what is to be said in summary fashion regarding therapy. It is becoming increasingly evident that, without a clearer insight into the underlying nature of this most unique disorder, further improvement in our methods of treatment can

hardly be hoped for. Fortunately there are now more trained investigators working on the problem than ever before, and their combined effort should ultimately result in a satisfactory solution of the riddle.

While new pathological lesions, both within and outside of the brain, continue to be reported in the literature as possible causes of the disease, it is probable that each of them, like numerous others described in the past, is merely incidental or is the result, rather than the cause, of the convulsions. Opinion at the present time tends to support the conclusion drawn by William Gowers<sup>1</sup> fifty years ago that, "Epilepsy is a disease of grey matter, and has not any uniform seat. It is a disease of tissue, not of structure." Lennox and Cobb<sup>2</sup> in their recent monograph, which is probably the most thorough and authoritative treatise so far written on this phase of the subject, were forced to a similar conclusion; namely, that "There is no constant anatomical lesion in epilepsy, and only a minority of patients with extensive cerebral pathology have fits." They add, "We are forced, then, to postulate some unknown constitutional element. . . . Almost any lesion plus the unknown X, which we call functional instability, may result in epilepsy."

These authors summarize the recent findings regarding factors which are thought to favor prevention or precipitation of convulsions, (see table 1) and then make the following comments regarding them: "The physiological changes which we have mentioned (anoxemia, alkalosis and edema) are themselves only contributory factors. They tend to induce seizures by in-

\*Resume of a lecture given for the University Postgraduate Extension Course in Medicine. From the Department of Pediatrics, University of Minnesota.

creasing the irritability of nervous tissues, producing an effect which is not specific for epilepsy. . . . Furthermore, the physiological changes mentioned will produce seizures only in those who are subject to seizures. Therefore, the important question yet remains, why, under a given stimulus, one person should have a seizure and another not. . . . Though this variability is presumably related to the subtle chemistry of the cell, its elucidation is for the future." Views similar to these of Gowers and of Lennox and Cobb were expressed by Kussmaul and Tenner<sup>3</sup> as long ago as 1859 and by Holmes<sup>4</sup> only recently.

TABLE 1

	Conditions Which May Tend to Prevent Seizures	Which May Tend to Precipitate Seizures
Oxygen . . . . .	Rich supply	Poor supply
	Acidosis by means of fasting, fat diet	
Acid-base equilibrium . . .	Ingestion of acids or acid-forming salts	Alkalosis by means of ingestion of alkali
	Breathing high CO <sub>2</sub>	Hyperpnea—"blowing off" CO <sub>2</sub>
Chemical constituents . . .	Low chloride (?) High calcium (tetany)	High chloride (?) Low calcium (tetany)
Water balance . . . . .	Dehydration	Edema
Permeability of tissues . .	Decreased	Increased
Intracranial pressure . . .	Decreased	Increased
Intracranial circulation . .	Impaired	Unimpaired

Table 1. Tentative list of physiological changes in the brain which may effect seizures. (From Lennox and Cobb.)

Our own results from experimental studies on epileptic children support this contention, that the chronic convulsive tendency is due to some abnormality inherent in the brain cells, which is not detectable by our present histological technique. Although other methods of approach to this phase of the problem have been comparatively fruitless so far, that of determining the nature of alterations in the chemical constitution of the body fluids following the use of regimens or procedures known to induce or to prevent seizures appears to be most promising. In fact, it has already yielded some interesting indirect evidence concerning the character of the disturbance present.

Certain changes, which we have observed in the quantitative relationships between the lecithin and cholesterol of the blood on the one hand and in the mineral and the water exchanges of the body on the other under a variety of clinical and experimental conditions, strongly suggest that the epileptic suffers from an inherent defect in the mechanism for controlling the semi-permeability of the brain cell membranes. The specific data which have led us to this tentative conclusion regarding epilepsy may be briefly summarized

here because of their possible bearing on future developments in therapy.

Because of the recognized importance of the physiologically antagonistic substances, lecithin and cholesterol, in the life processes of all cells and because of the characteristically large amounts of these compounds in nervous tissue, it appears to us that any definite data indicating reversal of the normal relationships between them may be accepted as presumptive evidence of a disturbance in brain cell physiology. While there is no absolute threshold level for either substance below which seizures are prone to occur, our studies so far have indicated that there is a close correlation between the magnitude of the lecithin to cholesterol ratio in the blood plasma and the occurrence of seizures. For example, where from five to seven samples of blood were taken serially throughout the day from twelve severely epileptic patients, the ratios, in almost every instance, were found to be from 25 to 100 per cent higher during the period of the day when the seizures occurred than at other times.

In one patient, who was kept on a ketogenic diet for several months with improvement but without complete cessation of seizures, determinations were made at intervals under uniform conditions. In the series of nineteen determinations of the plasma lipids, there was a definite gradation in the ratio lecithin-cholesterol, the highest being found nearest to the time of a seizure and the lowest most remote from one.

When the effects of various dietary regimens were studied under well controlled conditions in a severely epileptic girl over a period of sixty-three days, it was found that the ratio varied from 0.84 during a six-day period of freedom from seizures to 2.09 five days later, when seizures began to occur with great frequency following a radical change in diet. Sudden changes from a ketogenic to a nonketogenic diet or from a ketogenic diet with an acid ash to a similar diet with an alkaline ash caused an increase in the ratio and the recurrence of seizures.

In some instances the increases in the ratio appeared to have preceded the convulsions with a tendency to reversal afterward, but in most instances it was impossible to determine with certainty the time relationship between the two. Since it is generally accepted that lecithin is hygroscopic and tends to increase the permeability of the structures of cells to water and electrolytes, whereas cholesterol has the opposite effect, we believe that the observed imbalance indicates

an abnormal permeability of the cells associated with the convulsions of epilepsy.<sup>5</sup>

The relationship earlier shown to exist between the state of hydration of the body and the occurrence of seizures in severely epileptic children<sup>6, 7, 8</sup> has more recently been found to hold also for early or mild cases under special conditions. Heretofore, no satisfactory method has been available for the early diagnosis of the disease, especially during the long, free intervals between attacks. Our recent studies<sup>9</sup> have demonstrated, however, that convulsive seizures can be induced almost at will in these patients by placing them on a special regimen with low mineral and relatively high water intake while the anti-diuretic principle from the hypophysis cerebri is administered at sufficiently frequent intervals to cause the development of a strongly positive water balance. Seizures were found to occur regularly in a fairly large series of epileptic subjects within twelve to forty-eight hours, when amounts of water equaling from two to four per cent of the body weight were retained.

Non-epileptic control subjects did not have seizures of any kind under the same circumstances. Under the conditions of this special procedure, the osmotic pressure of the extracellular body fluids probably becomes sufficiently decreased to cause inhibition of a large excess of water by the brain cells. Other data point definitely to a disturbance in the ionic equilibrium between the fluid on the two sides of the cell membrane resulting from the procedure.

When an amount of sodium chloride, calculated to be just sufficient to prevent this dilution of the extracellular fluids, was added to the diet, seizures either did not occur at all or occurred only after a much greater gain in weight had been produced. The more or less specific response of epileptic patients to this procedure suggests that the inherent functional abnormality of the brain cells, already referred to, may ultimately find its explanation in a structural weakness of the barrier which normally protects against injurious changes in cell composition.

A third line of indirect evidence in favor of a disturbance in cell membrane permeability was derived from an investigation of the total water and mineral exchanges in severely epileptic children under a variety of well controlled conditions.<sup>10</sup> During periods of diuresis when no seizures occurred, sodium and chlorine were the predominating inorganic elements of the urine; whereas, during the alternating periods of water storage, when seizures occurred, potassium

showed a negative balance with a striking increase in the potassium to sodium ratio. During periods of positive water balance the increase in the ratio K/Na actually manifested itself from 12 to 36 hours before seizures occurred. This apparent "leakage" of potassium from cells, which was most marked during a period of sustained pituitary antidiuresis, may indicate an innate weakness in the retaining membranes, presumably of the cells of the central nervous system.

That an inherent deficiency of this type may conceivably account for the abnormal "convulsive reactivity" of the epileptic person is further suggested by the circumstance, that most factors which favor the occurrence of seizures are also known to increase the permeability of cell membranes; whereas, agents such as anaesthetics and narcotics which cause their cessation, have the opposite effect. Should this conception prove on further study to be sound as regards its essential features, it is probable that a much more effective form of therapy than any now available will be developed from more deliberate attempts to correct or compensate for the existing defect.

#### PLAN OF TREATMENT

The treatment of epilepsy may be discussed under the four headings, improvement in the patient's physical and mental hygiene, surgery, drug administration and dietary regimen. The very nature of the disorder demands that treatment be individualized so far as possible and that every factor known to be related to seizures be given due consideration in any program to be followed. It is universal experience that children and young adults, who have shown manifestations of the disease for short periods only, respond more satisfactorily on the whole than those who already show marked deterioration from many years of suffering from the disease. Every effort should be made to maintain effective treatment from the beginning because it has long been recognized that repeated convulsions cause damage to the brain which manifests itself clinically in various degrees of mental retardation or deterioration.

Treatment during a single attack is usually unnecessary beyond the point of preventing the patient from biting his tongue or from falling against some object that might result in injury to himself. The work of Lennox and Cobb would indicate that administration of a mixture of oxygen (90 per cent) and carbon dioxide (10 per cent) is an ideal procedure for the temporary control of seizures, when these gases and facili-

ties for their administration are available. For status epilepticus we have found it desirable to initiate treatment by the induction of light ether or chloroform anesthesia. At the same time morphine may be injected subcutaneously, and chloral may be given per rectum for their more lasting effects. Sodium luminal intramuscularly or amytal by rectum may be substituted for the latter, usually with good results.

### *I. Physical and Mental Hygiene*

General care is the factor which is most often neglected because it is so indefinite and so variable in its requirements. Still, in many cases, particularly of the petit mal type, it may be the most important element in the therapeutic program. Emotional excitation of any kind is particularly harmful in this type of case. Since excitation of stimulation by various means is known to increase the permeability of cell membranes under simple experimental conditions, it may well be that strong emotional reactions place a special strain at the point of greatest weakness in the patient subject to these seizures.

Insofar as it is possible, the child with epilepsy should be treated as a normal individual with regard to his play, school activities and home life, but with avoidance of fatigue and worry and with precautions being taken against hazards that might result in injury during a seizure. Congenial and satisfying occupation without too many perplexing problems is a great boon to these patients. The attitude of other persons associated with the epileptic child should be one of cheer and hopefulness rather than that which instills into him a feeling of dread and shame regarding a misfortune over which he has no control. It is usually desirable to help the intelligent patient to gain a clear insight into his problem, but it is also important at the same time to offset the possibility of provoking pessimism by pointing out his assets and by instilling genuine faith in the possible future of medical research in this field.

Regular mild exercise, plenty of sleep and avoidance of constipation appear to be helpful in many cases, but these are in themselves usually less important than control of the emotional factors.

### *II. Surgery*

Removal of old scar tissue in the brain by a special surgical procedure has recently been claimed to be of great value in certain traumatic cases,<sup>11</sup> but, aside from this and the removal of brain tumors,<sup>12</sup> little has been accomplished by

surgical treatment. Section of the sympathetic nerve fibers going to the arteries of the brain<sup>13</sup> might prove of benefit in the occasional case showing abnormality of their function, but this procedure as a routine measure has been very disappointing. Since anoxemia causes an increase in the permeability of cell membranes, it is altogether probable that prevention of arterial spasm by surgical interruption of over-active pressor nerves is beneficial to the extent that it favors removal of this one factor. However, the multiplicity of factors that may have a deleterious effect on the unstable mechanism, makes it unreasonable to expect uniformly good results from correction of any single contributing factor such as this.

### *III. The Use of Drugs*

Drug therapy still holds an important place in the management of the majority of epileptic patients. Our experiments, showing the effect of luminal on the water and electrolyte exchanges of the body, appear to support the belief that this drug has a more or less specific beneficial action in epilepsy, which justifies our continuation of its use. The specific action of the bromide ion, which we are now studying in a similar way, will probably be found to be slightly different. It not infrequently happens that, where one of these drugs fails to control the seizures, substitution of the other results in success. Aside from the anesthetics and potent narcotics, which are used practically only in status epilepticus, no other drugs than these two have proved to be of great value for regular use.

As shown in our experiments, urea and magnesium sulphate are temporarily effective, but only in proportion to their efficiency as diuretic and cathartic respectively. Since the mineral exchanges of the tissue fluids play one of the major roles in the regulation of nervous irritability, attempts at their control will probably constitute an important phase of the therapeutic program in the future, when more has been learned regarding them.

In appraising any therapeutic agent or regimen, it is essential to consider all of its immediate and remote effects on the patient and his disease. Experience has shown that prolonged use of drugs alone in sufficiently large dosage to prevent seizures is usually attended by untoward reactions, such as skin eruptions, digestive disturbances and mental dullness. Nor is mental retardation or deterioration entirely prevented by drugs. It is obvious, therefore, that drug administration cannot be relied upon as a

complete form of therapy. This is especially true in those cases in which the dosage required tends to increase progressively beyond the point of toleration.

### IV. The Dietary Regimen

The most effective therapeutic procedure in the majority of severely epileptic children is fasting.<sup>14, 15</sup> Were it possibly completely to reproduce the changes in body state that occur during periods of abstinence from food without the evil effects of starvation, we might have an ideal form of treatment. That this is so is indicated not only by the cessation of seizures, but also by the fact that the patient's mental processes appear to be most nearly normal under this condition.

Since it is not feasible to employ fasting even intermittently as a regular form of therapy, a diet providing metabolic mixture similar to that of the fasting state, namely, the ketogenic diet, has been substituted with a fair degree of success.<sup>16, 17, 18</sup> Careful studies have indicated that fasting and the ketogenic diet have several effects in common, all of which may contribute to the benefit observed. The low mineral intake, the loss of body water, the resultant change in intestinal flora, the direct anaesthetic effects of the ketone bodies produced in the tissues and the indirect sedative effect of the mild acidosis provoked have all been given credit separately for the result observed. It is probable that the combination of several effects accounts for the improvement in the patient.

With the idea of decreasing the amount of fluid in the subarachnoid spaces and in that way reducing the mechanical pressure on the brain, which he assumed to be increased in epilepsy to a degree sufficient to cause convulsions, Fay greatly restricted the water intake in a series of epileptic patients with marked reduction in the number of seizures. Almost simultaneously we made similar observations but had as our objective intensification of the effect of fasting and the ketogenic diet on the basis of the finding by Gamble, Ross and Tisdall, that water loss is one of the prominent effects of fasting. In severe juvenile cases the effects of this procedure on the occurrence of seizures was found in the majority of cases to be striking.

Since it is often impracticable to deprive a patient of water to the limit necessary for control of the seizures over a long period of time, we have found it more satisfactory to combine the beneficial effects of the different regimens, avoiding the extremes often necessary when one alone is depended upon. This practical consideration

and the fact that certain harmful results have been reported from the prolonged use of the strict ketogenic diet<sup>19, 20</sup> have led us to employ a border-line type of diet. Children in particular tire of the more liberal diet far less quickly, and are, therefore, happier and more co-operative on it than on the strongly ketogenic diet. A moderate limitation of the total water intake compensates for the lessened degree of ketosis. A general formula for constructing a suitable diet based on these principles is presented below.

The fact that the mentality of the patient appears to be more nearly normal while he is fasting or is under dietary control and tends to improve with time indicates that some defective structure, presumably the brain cell membranes, may be favorably altered by the induced change in body metabolism. This possibility justifies the effort necessary to carry out a fairly strict, and admittedly rather troublesome, dietary regimen over a long period of time. The most nearly ideal plan of therapy now available, therefore, particularly for children with so-called genuine epilepsy, is one in which a proper dietary regimen is supported by rational physical and mental hygiene, and, if necessary, small doses of luminal. This type of program is sufficiently elastic for use with any patient, but naturally requires adjustment for the individual according to his special requirements. When necessary, its effectiveness can be increased temporarily by reducing the total water intake, by making the diet more strongly ketogenic or by increasing the dosage of the drug.

It is our practice to begin treatment in all but the mildest cases with a three or four-day fast, and in addition, moderate restriction of the water intake in the more severe cases. Following the period of starvation, a diet adjustment is begun on the basis of the following formula:\*

TRIAL DIET FOR EPILEPTIC CHILD	
1. For Children of Pre-school Age: (or body wt. up to 18 Kg.)	
Water	20 to 30 Gm. per Kg. of body weight.
Protein	2.0 Gm. per Kg. of body weight.
Carbohydrate	1.5 Gm. per Kg. of body weight.
Fat (Gm.) =	$\frac{60 \times \text{Kg. of body weight}}{9}$
2. For Children between the ages of 5 and 10 Years: (or 18 to 32 Kg. wt.)	
Water	15 to 20 Gm. per Kg. of body weight.
Protein	1.5 Gm. per Kg. of body weight.
Carbohydrate	1.0 Gm. per Kg. of body weight.
Fat (Gm.) =	$\frac{45 \times \text{Kg. of body weight}}{9}$
3. For Children above the Age of 10 Years: (or above 32 Kg.)	
Water	10 to 15 Gm. per Kg. of body weight.
Protein	1.0 Gm. per Kg. of body weight.
Carbohydrate	1.0 Gm. per Kg. of body weight.
Fat (Gm.) =	$\frac{40 \times \text{Kg. of body weight}}{9}$

\*The water allowance includes that contained in the food as well as the drink. The diet for children should include yeast or yeast extract, fresh orange or tomato and cod-liver oil. Foods may be seasoned with saccharine, spices and extracts but no salt, alkali or alcoholic beverages should be given.

All that is required for calculating such a diet is an ordinary food table and knowledge of the patient's weight. If the response to this regimen is not satisfactory, it will need to be slightly modified as suggested above.

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## The Prevention and Treatment of Diarrheal Conditions in Infancy

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*Minneapolis*

TWO decades ago, diarrheal diseases headed the infant mortality table with a wide margin. Now, their death rate has fallen well below that of upper respiratory infections. Though, a remarkable decrease in deaths from diarrheal disorders has occurred, the loss of life still remains very great and is the more deplorable because preventable.

Discussion of prevention and treatment of a disease presupposes some knowledge of its etiology. Our present concept of the etiology of diarrheal diseases, inadequate as it is, has been arrived at from observations by our predecessors. The history of our progress is very interesting, but we must be brief. Overlooking early superstitions of natural phenomena influencing diarrheal conditions, we find an illuminating dissertation on this subject by West<sup>1</sup> in his text published in 1868. Now 1868 is not long ago, and although we find beautiful descriptions of the clinical pictures, there are strange etiological causes ascribed. One finds as causes, teething, atmospheric changes, miasmata as malaria, but never a hint of the role of impure milk nor a suggestion of boiling the milk as a preventive measure. This represents the state of our knowledge until Escheich's<sup>2</sup> monograph in 1886. He worked out the association of the colon group of organism with diarrhea. An attempted pathological basis of classification failed for the simple reason, aside from the dysentery group, thousands of autopsies on infants dying with diarrhea,

showed no striking changes along the intestinal tract. Failing a pathological basis of classification, Czerny<sup>3</sup> made intensive studies of the effects of food elements and gave us the concept of injury to the organism from an excess of fat or carbohydrate in the diet. At the same time, Finkelstein<sup>4</sup> demonstrated the deleterious effects of the salts in the milk, under certain conditions, and gave us a profoundly helpful therapeutic agent in "Eiweiss" or protein milk. Then Davidson<sup>5</sup> did excellent work in establishing certain types of diarrhea attended with fever, pus and blood in the stools, as due to dysentery bacilli; a true infection of the intestinal walls. Marriott<sup>6</sup> has done much to clarify the relationship of certain types of persistent diarrheas, associated with focal infections outside the intestinal tract, such as the maxillary sinuses or mastoid cells (parenteral infections). At present we feel we possess a partial insight into the etiology of diarrhea, though we admit many loopholes in our knowledge.

Everyone who writes on diarrhea has his own pet classification of these disorders. We feel that until we know more of the varying intestinal bacterial flora, of cell pathology, of chemical changes attending diarrhea, no classification can be truly scientific. Still, for the purpose of discussion, we must classify certain clinical manifestations to avoid confusion and to have some scheme of prevention and treatment. It is solely for this purpose that we discuss diarrhea under the fol-

lowing headings. (For sake of brevity we omit diarrhoea caused by specific conditions, as typhoid fever, coeliac disease, food idiosyncrasy and toxic drugs.)

(A) Diarrhoea in the newborn.

1. Physiological.
2. Hunger stools.

(B) Diarrhoea in Older Infants.

(a) Non-Infectious Diarrhoea.

1. Too much appropriate food.
2. Inappropriate food:
  - Excessive Fat.
  - Excessive Carbohydrate, etc.
3. Spoiled food.

(b) Infectious Diarrhoea.

1. Enteral Infections.
2. Parenteral Infections.

(C) Alimentary Intoxication.

Before taking up specific causes of diarrhoea, certain general considerations must be noted.

- (a) Poor Hygiene—It is well established that diarrhoeal diseases prevail where bad air, lack of sunshine and filth deplete the individual's digestive capacities as well as other functions.
- (b) Excessive heat is a very important factor, hence "summer diarrhoea." High temperatures act as depressants, lead to loss of body fluids, cause foods to ferment and spoil quickly. Further, Yllpo<sup>7</sup> has shown that heat decreases the hydrochloric acid content of the gastric secretions. This in turn lowers digestive capacity, permits the development of a much altered bacterial flora in the intestinal tract, and favors the elaboration of decomposition toxic substances.
- (c) The tolerance or the capacity to digest foods is lowered by even a mild diarrhoea. This is exaggerated with each recurrent attack. We have little fear of the mild diarrhoea of the first heat wave of summer, but each recurrence proves less tractable to treatment and our troubles culminate in the heavy mortality of late summer and early fall.

DIARRHOEA IN THE NEWBORN

1. Stools of loose consistency, and numbering 6 to 12 a day, may be normal in the first days of the new-born period. An intestinal tract, sterile at birth, presents a rich bacterial growth in a few hours, which in the presence of a large amount of meconium could elaborate toxic materials to no good purpose

for the infant. However, this is provided for by the laxative action of colostrum. Of practical application of this observation is the avoidance of cathartics in the early days of the infant's life.

2. Frequent loose stools with much mucus and little fecal content, so called "hunger stools," occurring at the end of the first week of life, are usually due to lack of food. Aside from the peculiar stools and lack of gain in weight, the infant may appear normal and cry surprisingly little. Such an infant requires no period of starvation, no catharsis, but it does require food. Feed it reasonable food in reasonable amount (which is surprisingly large) and the stools will quickly become normal in number and appearance.

DIARRHOEA IN OLDER INFANTS

(a) Non-Infectious

1. Too much appropriate food.

This is probably a rare cause of diarrhoea. As a rule, babies are underfed rather than overfed. Occasionally an infant will have a very high level of satiation and will take an almost unbelievable amount of food. Such an infant may respond with vomiting, diarrhoea and frequently eczema. Greatest danger of this condition occurs during periods of hot weather. The mother fails to differentiate between hunger and thirst; the baby takes the milk not because it is hungry, but because the food is wet. Therefore, at all times, but especially in hot weather, offer the infant water freely.

2. Inappropriate food.

Diarrhoea from inappropriate food (the food may be pure and wholesome), surely is of frequent occurrence. We insist, however, that under average conditions, the infant's digestive system will tolerate an almost scandalous amount of abuse before it rebels. However, during hot weather, and especially if there has been a preceding digestive upset, diarrhoea may result from an excess of fat in top milk mixture or again from an excess of carbohydrate. Protein we feel is seldom, if ever, an offender. An excess of roughage, as in coarse vegetables and fruits, may also cause a diarrhoea.

3. Spoiled or fermented food.

Now tainted and fermented food may cause diarrhoea, but certain toxic substances must be present to get this result. In experimental work, sour, spoiled, tainted food

has been used over a considerable period of time without bad results, and then without warning a "blow up" occurs. We would be much enlightened if we knew just what the toxic principles are. Strange to say, milk which has been pasteurized may become more dangerous than raw milk, because in the former the organisms which sour the milk are destroyed. Sour milk is usually discarded; a toxic milk may be retained because it is sweet to the mother's taste.

(b) *Infectious Diarrhea*

1. Enteral Infections, i. e., infection within the intestinal tract.

This type of diarrhea is characterized by fever, blood and pus in the stools. With persistent diarrhea accompanied by fever, great prostration, a scaphoid abdomen, blood and pus in the stool we may be sure we are dealing with a true infection of the intestinal wall. Postmortem examination will show engorgement, swelling of lymphoid tissue and ulceration of the mucosa. With cultures from the stool, with varying technique, specific bacillary dysentery organisms may be found. This avails the patient but little, for as yet we lack effective specific therapy. But the procedure is of value in that it should lead to isolation of the patient, careful aseptic nursing which in turn will prevent the spread of the disease.

2. Parenteral Infection, i. e., infection outside the intestinal tract.

Diarrhea from this source has long been known, but not by this particular name. Every experienced clinician has feared diarrhea attendant upon tonsillitis, measles, pneumonia and many other diseases. But we have all overlooked the diarrhea attending a latent infection in nose, throat, sinuses, mastoid or kidney. We are much indebted to Marriott for giving us the clinical picture. When an infant which has been thriving on appropriate food develops an upper respiratory infection, followed by a persistent diarrhea, the proper procedure is a search for a focus of infection, rather than the juggling of the formula. Almost miraculous cures have followed removing adenoids, draining sinuses and opening mastoids. Needless to say, these cases are not of every-day occurrence. Then too, we must not forget that infections at these sites may be terminal affairs rather than casuative factors.

(c) *Alimentary Intoxication*

There is a type of severe diarrhea presenting the picture of extreme dehydration, fever, profound central nervous system manifestations as stupor and convulsions, sugar, albumin and casts in the urine. Now most frequently the disease declares itself as an infectious diarrhea (enteral or parenteral) although it may be the sequel of simple non-infectious diarrhea. Marriott emphasized the infectious element. On the other hand, others explain it on a chemical basis. Schloss<sup>8</sup> in 1918 noted the failure of kidney function and likened the condition to that of uraemia without evidence of injury to the kidneys. Hartmann<sup>9</sup> and Gamble<sup>10</sup> seek an explanation in the loss of fluid and alkali base with consequent acidosis; but replacement of lost base and fluids often fails to rescue the baby. Recently Dodd<sup>11</sup> et al. have found in the blood a specific toxic substance, guanidine, which they think is the true cause. They also suggest the administration of calcium as a specific cure. We hope their work can be confirmed, for alimentary intoxication is baffling as to cause, and distressing as to results, since from 35 to 70 per cent of these babies are lost.

PROPHYLAXIS OF DIARRHEA

The prophylaxis of diarrhea is suggested in the discussion of its etiology, but may be briefly recapitulated.

1. Good general hygienic conditions.
2. Protection against excessive heat.
3. The use of appropriate food—in this we cannot be specific. No one denies that breast milk is the best and safest infant food. But under normal conditions a baby will thrive on most any reasonable diet, including modified, dried, evaporated or synthetic milk, provided the foods are given in concentration and quantity so that the babies' caloric needs are covered.
4. Most important of all, the food must be sterile or at least free from pathogenic organisms and toxins. Cow's milk should be pasteurized or better still, boiled. For years we have boiled all milk (certified, raw or pasteurized) used in infant feeding. Do not fear the scurvy bugaboo, boil all cow's milk, or use a sterile substitute, then give a little orange juice.
5. Consider the simple diarrhea as dangerous from its incipency. The protracted or oft

repeated diarrhea breaks down the infant's tolerance for all foods and lowers its power of resistance to infections and chemical changes.

#### TREATMENT

Widespread knowledge, by the laity, of the simple rules of prophylaxis would avoid occasion for treatment almost to the vanishing point. Still cases will be presented to the doctor for treatment, and therefore certain principles of therapy are indicated.

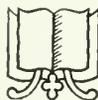
1. As a general rule, use no cathartics, or at least be judicious in their use. Occasionally, early in the disease, with bowels full of spoiled or fermenting food, a cathartic may be indicated. Usually the intestinal tract is empty of food when the patient is presented. Catharsis robs the system of much needed fluids. Further, the persistent use of cathartics may irritate the intestinal mucosa to the point of causing the outflow of blood.
2. A short starvation period may be indicated, but only for a few hours. An infant stands starvation badly. Many infants with diarrhea have literally been starved to death.
3. If the infant is dehydrated, supply fluids: by mouth, by bowel, under the skin, into the vein, into the abdomen, by one or more routes. What fluids to use depends upon the exigencies of the case—water—normal saline—glucose solution. If there has been severe depletion, use Hartmann's Solution, for it supplies lost salts as well as fluids. In very severe cases a transfusion of blood may turn the tide.
4. The infant must have food. Breast milk is the perfect food, but many different foods may suffice. However, there are several indica-

tions. First the food should be low in fat and carbohydrate content. Secondly, since we know the hydrochloric acid content of the stomach is low, acid foods such as protein milk, lactic acid milk or other buffered mixtures will be best tolerated.

5. In the diarrhea of dysentery infection, lacking specific treatment, the above mentioned measures should be employed together with strict isolation to prevent further spread.
6. In diarrhea of parenteral type, we must employ the above general measures, and also attempt to remove the focus of infection, such as paracentesis of the tympanic membrane, opening the mastoid or draining sinuses. But let this not be an eleventh hour procedure.
7. In alimentary intoxication, all of the aforementioned modes of treatment may be called into play, unfortunately, often with disappointing results. The theory of the toxic cause being guanidine, which can be neutralized by calcium, offers us new hope.

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## Information a Physician Should Have in Regard to Healthy Teeth and Mouths of Children

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**A**CCUMULATED research, study and thought, have firmly established the fact that there is a direct relationship between conditions found in the mouths of children, and the child's general physical and mental condition. In order to most successfully combat ill health, and disease, the physician must eliminate all possible causes of lowered resistance of the child. Badly decayed and abscessed (gum boils) teeth, malocclusion (irregular teeth) canker sores, and inflamed gums are all signs which the doctor cannot ignore. They are all pertinent and important in the diagnosis and prognosis.

### CAUSES OF TEETH DECAY

At the present time, caries is the most prevalent of all human diseases of civilization. Many theories have been advanced as to the cause and prevention of decay of teeth. Heredity should be considered as a factor in the control of caries. How much of a factor can only be conjectured. The ductless glands have been advanced as controlling decay of teeth, but they should possibly be classed under the general heading of heredity. Prophylaxis or the proper care in brushing and cleanliness of the mouth may be considered of importance in the control of mouth health. Recent research leads us to believe that diet plays an important role in the control of caries. It is a disease primarily of childhood, there being comparatively little new caries after adulthood. Most of the studies have been conducted on experimental animals and children.

Howe of Boston, Bunting of Michigan, Boyd and Drain of Iowa, John Marshall of California, and others are pretty well agreed, that if a child would get a sufficient amount of fruits, vegetables, milk, and a minimum of sweets and pastries, the question of caries would be practically solved. Mellanby of England, McCollum of John's Hopkins, Price of Cleveland and others, feel that an activator such as cod-liver oil or butter is most important in order to prevent caries. Mellanby and McCollum are interested in cod-liver oil, and Price believes that butter would produce better results. To a certain degree, caries may be controlled and the loss of

teeth prevented by proper and carefully placed dental restorations.

### MALOCCLUSION CAUSES

Malocclusion not only detracts from the pleasant appearance of an individual, but also prevents proper mastication of food, which in turn invites future gastro-intestinal disorders. One would not consider driving an automobile which ran on only one cylinder, because it developed only twenty-five per cent of its maximum efficiency. Yet many children are masticating at only ten per cent efficiency, because the teeth are so placed that they seldom meet.

Some of the preventable causes of malocclusion which the physician should be able to recognize and assist in preventing or eliminating, are the various childhood habits, such as thumb-sucking, blanket sucking, tongue and lip sucking and the use of pacifiers. Any of the above habits, if allowed to persist, are almost certain to develop a condition of ugly irregularity of the teeth, and prevent proper mastication of the food, which is so necessary to growing children. Mouth breathing, often caused by some nasal obstruction, is another preventable cause of malocclusion. A protrusion of the upper anterior teeth and a narrowing of both dental arches is typical. The removal of the tonsils or adenoids or both would be apt to prevent and sometimes correct this malformation.

Another preventable cause of underdeveloped dental arches is the premature loss of the baby or deciduous teeth. Nature has a tendency to close up spaces between the teeth, and collapse the arches, thus preventing the succeeding permanent tooth from taking its proper place. As a result, it is either impacted and does not erupt, or if the eruption does take place, the tooth is forced either to the cheek or tongue side. The correction of this condition would necessitate the artificial expansion of the arch to make room for the crowded tooth. Thus a procedure which requires years to correct could have been prevented by the retention of the deciduous tooth the proper length of time, and this procedure would have required less than an hour of time.

## PERIODS OF ERUPTION OF TEETH IN CHILDREN

Even though the eruption of teeth varies between individuals, still in order to better understand how long the deciduous teeth should normally remain in the mouth, a brief résumé of the time of their appearance might be helpful.

The deciduous teeth begin to erupt at about the eighth month, and in general the child adds approximately one tooth each month, until the age of twenty-eight months, at which time all twenty baby teeth should be in place. To compute, then for example, the number of teeth a twenty-month old baby should have, would be simple. About twelve teeth would be the answer. A variation of three or four teeth either way is quite normal. In other words, a twenty-month old baby might have between eight and sixteen teeth.

Until the age of six years the child's mouth contains twenty deciduous teeth. At six years, four permanent teeth, called the six-year molars, are erupted. These do not replace any of the baby teeth, but take their position directly behind the deciduous teeth, thus making a total of twenty-four teeth. Between the sixth and eighth year, the anterior eight deciduous teeth, four upper and four lower, are replaced by the permanent successors. The cuspids and baby molars are replaced at about the tenth year, at which time all twenty-four teeth in the mouth are of the second dentition. At twelve years of age the second set of four molars make their appearance, and they take their place directly behind the six-year molars. The wisdom teeth erupt at from sixteen to twenty-four years of age. In general, girls erupt their teeth about six months earlier than do boys of the same age. Of the anterior teeth, the lowers often erupt about one year earlier than do the corresponding upper teeth, and subnormal children erupt their teeth later than do normal children.

IMPORTANCE OF KEEPING DECIDUOUS TEETH  
HEALTHY AND IN THE MOUTH THE  
PROPER LENGTH OF TIME

The term "temporary teeth" when referring to the deciduous or baby teeth is a word of the past. The deciduous cuspids (eye teeth) and molars are, or should normally be kept in the mouth for a period of approximately eight years. Quite frequently, according to statistics, a number of the teeth of the second dentition remain in the arch less than eight years.

The deciduous teeth should be well taken care of, not only because they remain in the mouth

for a long period, but also because they help masticate the food for the child during the child's most important growth period. Badly decayed, aching abscessed teeth, and diseased gums prevent their proper use.

Assuming that decay had been allowed to progress in the deciduous tooth of a child, the picture would probably be as follows: The first warning would be that of pain and discomfort. If allowed to continue, the pulp would become involved and the tooth become abscessed. A fistula or gum-boil would make its appearance on the gum surface close to the offending tooth. Allowed to remain, these bacteria would drain constantly into the system and act as foci of infection, tending to lower the resistance of the child. The subsequent extraction of the tooth to eliminate the infection will create a space which should be maintained by some sort of a restoration in order to prevent future possible malocclusion. Should the space not be maintained, irregularity of the second dentition is almost assured.

## GINGIVITIS—INFLAMMATION OF GUMS

Pyorrhea is a disease, as far as we know, of adulthood only, unfortunate for adults, but fortunate for the child. Vincent's angina or trench mouth is less often found in children than in adults. Gingivitis or inflammation of the gums of varying degrees is seldom found in children, unless some systemic disturbance is present. In a recent examination of some twelve hundred Minneapolis school children, gingivitis was found to be present in from five per cent to eight per cent, depending upon the social levels from which these children were selected. Upon examining the gums of the sick children at the University Hospital, it was found that twenty-three per cent had gingivitis. In the children who were under treatment because of gastro-intestinal disturbances, gingivitis was found to be present in forty-three per cent.

It may be concluded then, that should gingivitis be present in a child's mouth, some systemic cause most likely of a faulty digestive condition, might be, to a large extent, responsible.

It is important to bear in mind then, that the deciduous teeth should *not* be considered as temporary, but as quite permanent, that their good health and usefulness is extremely important to the proper development of the child, that gingivitis is a symptom of a more serious ailment, that malocclusion to a great extent is preventable, and that caries to some extent at least, is controllable by the proper care and diet.

## Diphtheria Immunization

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THE value of diphtheria immunization has been definitely established in many communities. The occurrence and mortality of diphtheria has been greatly reduced since the introduction of immunization against the disease.

In many states the campaign has been so effective that it is difficult to find any children either of school or pre-school age that are not immunized. This, I am sorry to say, is not the case in my own state. Here just the opposite prevails. In a few districts immunization of school children was recently begun. The general practitioner has done very little if anything among his patients. It is indeed sad to have to make this report when we all know the value of immunization and the horrors of the disease. To irradiate diphtheria completely, immunization must become routine for the pre-school child.

Although several methods have been used successfully for immunization, the writer prefers and now uses toxoid. First, because as a rule, only two injections are necessary to immunize. Each injection contains 1cc. of toxoid. The interval between injections is three weeks. Extensive study has been carried out by Coopersmith and Weinfeld<sup>1</sup> reporting their results on the rapidity

of immunization with toxoid. Usually in 6 weeks to 2 months the previously positive Schick test shows a negative reaction. Second, when reactions to toxoid have been reported, they occur but rarely in children. There may be a slight redness around the point of injection but usually so slight that it is not reported unless the mother is questioned about it. Also serum sensitization is avoided. Schwartz and Janney in their series observed that toxoid gave a greater percentage of immunes than did toxin-antitoxin.<sup>2</sup>

Each year or oftener, if desired, children should be given the Schick test to follow up their immunity. Some will show positive reactions, but the majority remain negative.

If every one of us would make every effort to immunize all children at the age of about one year, which is believed to be the best time, soon very few would be left to immunize upon entering kindergarten. If we would only take this responsibility soon it would become routine. How can we expect parents to know about this preventative measure if we do not advise and recommend it to them?

<sup>1</sup>A. J. D. C., Nov., 1932.

<sup>2</sup>A. J. D. C., March, 1930.

## School Hygiene in 1950—A Prophecy and a Hope

MAX SEHAM, M.D.

*Mimcapolis*

IN THE future school buildings will be constructed primarily for the purpose of serving to the utmost the interests of the child as well as beautifying the neighborhood. Sanitary experts will sit in council with the architects and the board of education (unless they have become extinct) and remain in charge of the building after construction is completed. Out-of-door schools will be universal and the lighting will be the light of the sun. The unsanitary, dilapidated, prison-like, one-room country school will have gone, and in its place will stand the consolidated school, a monument to the interest of the community in its children.

All seats and desks will be adjustable, and lunches will be served in every school to assure all children of at least one adequate meal a day. Physical education, under the leadership of experts, will be given to every child, every day. The weak and defective child, through corrective exercises in small special classes, will get his full opportunity for normal developments. The health of the child will be under the care of adequately trained physicians and nurses, both of whom will devote their full time to their work.

Medical inspection will be complete, and not made over the clothing—not 30 per cent of the children but 100 per cent—not one part of the

child but the whole child. The school doctor will be not only an inspector, but also a hygienist and an educator whose opinion will be respected and whose advice will be followed.

The school curriculum will give adequate attention to healthful procedures in methods of instruction, in the arrangement of programs, in the length of school day, in examinations and in tests, in the arrangement and supervision of recesses, in the requirements of home study, in the frequency and length of vacations. Mental hygiene will be expressed in the provision for a suitable task for every child, the adjustment of tasks to the sequence of the stages of individual development, preventive discipline, respect for the personality of each pupil, and the study and understanding of each child from the genetic point of view.

Educationally sound instruction in health will be given to the child each day from kindergarten up to and through high school. He will grow naturally into habits, attitudes and knowledge of physical, mental, emotional and social health, without much direct consciousness of personal health. Such instruction will be given whenever the opportunity arises for the practical application of some idea or principle regarding health. With this plan of informal learning of health through practical activities, it is apparent that every teacher in the school will be simultaneously a

teacher of health.

High standards of health will exist for the school staff. The health of teachers, principals, janitors, and others employed in the schools will be protected. The health work of the schools will be kept out of politics and be freed from pressure by private groups or organizations. Parents will have an intelligent understanding of the fundamental principles of health and hygiene; the traditions and superstitions regarding health will be regulated to the shelves of old bric-a-brac.

There will be co-operation between the home and the school, so that instead of distrust there will be a mutual interest. Such a school system will be a dynamic and living force, flexible and changeable to conform with the needs of the age, ever ready to absorb and assimilate the teachings of progressive educators. Every child, whether of rich or poor parents, whether living in the city or on the farm, will enjoy equal opportunity for full growth and development. The slogan of the schools will be "health first." There will come to life a health-conscience which will create as great a pride in the biological achievements of the child as now exists in his mental accomplishments. The American public school will become the day-home of the child, where all his faculties will find opportunity for the highest development.



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### A STEP FORWARD

The May first issue of The Journal-Lancet, published in celebration of Child Health Week and dedicated to the child, was made possible through willing and earnest co-operation of physicians from New York, Illinois, the Dakotas and Minnesota. Readers of these pages, which are presented to the medical profession of the northwest as a pediatric symposium, will find therein portrayal of high ideals, and enunciation of sound principles and advice contributed by teachers and colleagues whom we admire and respect. In this number our attention is directed toward an enlightened consideration of the desirability of foster home care versus institutionalization of young children, a goal impossible of attainment were it not for that "maternal instinct" to which Dr. Abt pays tribute. In this number our attention also is called to certain valuable therapeutic measures, the utilization of which undoubtedly will alleviate afflictions from which many children suffer.

Advances in knowledge have enlarged the service physicians can render to mankind and have created opportunities obligating them to enter fields of endeavor undreamed of by our predecessors. Encouraging and significant progress already has been made in the field opened through more complete understanding of fundamental principles relating to the transmission and prevention of communicable diseases and through discoveries which have made active immunization against certain diseases safe and effective.

Our information and armamentarium has reached the point of development where it becomes the moral duty of every physician to enlighten the public regarding these matters, and to urge them to take advantage of the prophylactic and protective measures now available. Our obligations and the facilities for their fulfillment continually grow as knowledge advances and spreads, and it is trusted that ideas gleaned from these pages by the medical profession of the northwest may prove beneficial, through them, to children in general, and lead us another step forward toward the attainment of the ideals embodied in the "Child's Bill of Rights."

C. A. S.

### LOOKING BACKWARD

Pediatricians of the present day, unmindful or unaware of the interest shown by their earlier confreres in the child, its diseases and its welfare, will be enlightened and perchance astonished by reference to the literature of the pioneers in medicine of Minnesota of half a century ago.

While it is quite obvious that the problems of nutrition in infants were to them an uncharted sea and the development of serology with its concomitant possibilities for immunization undreamed of, yet they undoubtedly showed a clear insight and understanding of certain elementary problems incident to the growth and development of the child. So long ago as 1870, an article entitled "Normal and Abnormal Schools" by Doctor Brewer Mattocks of St. Paul appears in the July number of The Northwestern Medical and Surgical Journal, the first medical publication in Minnesota, edited by the late Alexander J. Stone, in which the writer, after a visit to the state normal school during a meeting of the State Medical Association at Winona, June 14 and 15, 1870, takes occasion to offer some more or less caustic criticisms anent the indiscriminate application of physical exercise among the pupils, while at the same time paying a high compliment

to the teaching methods then in vogue. This article caused an animated discussion which appears in later numbers in a spirited correspondence between Dr. Hewitt of Red Wing and Professor Phelps, the superintendent of the Normal school.

At this meeting also there is the report of an interesting discussion on the subject of Scarlet Fever. In the September number Dr. A. E. Ames of Minneapolis has an article on "Cholera Infantum" in which stress is laid upon maternal nursing. In the October issue is a paper entitled "Cerebro-Spinal Meningitis" by Dr. H. Galloway of Rochester in which treatment by hot packs and the administration of subcarbonate of iron was regarded as of value. Calomel and opium were given for the convulsive seizures as well as the inhalation of chloroform. Lumbar puncture and Flexner's serum were then undreamed of possibilities.

In the November issue an article by Hiram Carson, M.D., of Philadelphia appears entitled "Food for Infants" in which he deplors the too frequent feeding of highly diluted milk mixtures. One of the recommendations is "For a child of one month: to a pint of cool milk add two tablespoons of boiling water, the mixture to be well sweetened with white sugar, and a healthy child of that age will take twice that much in twenty-four hours." He gives as a reason for the addition of boiling water, the need for bringing the food up to body temperature. Truly we have gone far since those days in solving the problems of nutrition.

Another topic of interest is an essay on "Post natal Atelectasis or Pulmonary Collapse in Children" by Dr. S. D. Flagg of St. Paul, presented at the annual meeting of The State Medical Society in February, 1871. Dr. D. W. Hand of St. Paul contributes an interesting review of "Enterocolitis with Meningitis in Children" in which he cautions his readers against the use of opium, regarding belladonna and ergot as valuable remedies, using ice to the head as an adjunct. At the semi-annual meeting of the State Society held at Minneapolis in June, 1871, Dr. Brewer Mattocks of St. Paul read a well-considered and able paper on the subject of "Diseases of Children." Dr. Mattock's position assumed in the essay that the nature and treatment of diseases of children was the same in principle as in the diseases of adults; that the matter of children's diseases was not a specialty in the profession; that they were governed by the same laws of being—was stoutly contradicted by Dr. Hewitt of Red Wing, who took the ground that the

child was an imperfect, immature being, whose pathology was entirely distinct from that of the conditions of human maturity. In the published transactions of the State Medical Society for 1872, Dr. M. Hagan of St. Paul contributed a paper entitled "Vaccination" in which he says: "It is the moral duty of every physician to enlighten the public regarding matters appertaining to the prevention of epidemic and contagious diseases and to recommend a universal system of vaccination and revaccination for, by so doing, we would have the satisfaction in a few years of seeing this destructive and most dreaded of all diseases exterminated from the earth." Passing over a period of twenty-five years, in a report of the committee for the study of diseases of children, of which Dr. C. L. Wells was the chairman, we find the following:

"Less alluring and more circuitous as a pathway to fame, your Committee would nevertheless, with real and genuine earnestness, urge the ever immediate and pressing demands of pediatrics upon all members of the profession, and express the belief that no field offers more brilliant opportunities for conscientious study and investigation."

". . . With a mortality so great, and scarcely diminishing, with difficulties so many and seldom wanting, your Committee is constrained to believe that even now too little attention is being bestowed upon the work of preventive and too much reliance upon the curative power of drugs." As we review the work of our forbearers in pediatrics we confess to a feeling akin to awe for their intuition and a reverential respect for their painstaking study of the problems confronting them. Today, with full time professors, research workers, and the development of knowledge regarding the chemistry of nutrition, preventive medicine, health centers, child guidance clinics, etc., we may well ask: "What of the future?"

J. T. CHRISTISON, M.D.

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MERLIN CHANCEY JOHNSTON, M.D.

We are again called upon to record the passing of a pioneer physician and to pay our tribute and respect to his memory.

Dr. M. C. Johnston was born December 23, 1872, in Hastings, Minnesota, and died at the St. Luke's Hospital, Aberdeen, South Dakota, April 2, 1932.

He received his early education in Aberdeen, graduating from the high school there and taking his medical course at Rush Medical College, Chi-

ago, graduating in 1896. Following his graduation he located in Minneapolis and practiced there for four years, during which time he was professor of Pathology at Hamline University. He then returned to Aberdeen, his former home, where he practiced medicine up to the date of his death.

His health had not been good since 1926, when he had his first heart attack. He worked right along, notwithstanding the frequent recurrences of these attacks. On November 23, 1931, he was taken with an attack more severe than usual and had to remain in bed. Following this he seemed to rally at times but was never able to be up and around. About three weeks before his death he suffered an embolism, occurring at the bifurcation of the abdominal aorta, which resulted in gangrene of the right foot. A second embolism followed on April 2nd, bringing an end to his life in a few hours.

Dr. Johnston was a member of the District Medical Society; the South Dakota State Medical Association; the American Medical Association and the Military Surgeons of America. He was Past President of the District Medical Society and had served his district as a member of the council of the State Medical Association for several years. He had been Health Officer and School Physician for many years. He served his country during the World War as captain in the medical corps and following his honorable discharge, he received a commission as major in the Reserve Corps and also the National Guards.

He was examiner for the Veterans Bureau from the time of his discharge from the army until his death. He was head of the National Department of Child Welfare of the American Legion; a member of the Executive Committee of the American Legion; Grand Correspondent of the 40 et 8 in 1922; Grand Chef deGare and delegate from the local post to the National Convention at San Francisco and also again at St. Paul.

Dr. Johnson was a member of the Editorial Board of the Journal-Lancet, having been appointed only a few months ago.

He was Past Exalted Ruler of the Elks Lodge and chairman of the Do-Good Committee for many years. He was also Past Chancellor of the Knights of Pythias and a member of the Masonic Lodge.

Dr. Johnston was married March 22, 1899, to Miss Madge King of Minneapolis. From this union two sons survive, Bruce of Aberdeen and Robert, now a student of the Naval Military

Academy, Annapolis, and one daughter, Mrs. R. E. Kehrer of Ashland, Wisconsin.

Dr. Johnston was a very genial gentleman and a very well qualified physician and surgeon, always interested in medical organizations and the welfare of physicians. He promoted good ethics and practiced them as well. He was a friend of every physician in the district and his honesty, integrity and character were never questioned. He was respected by the medical profession and laity alike.

He enjoyed sports of all kinds and was an excellent shot and a good hunter. He spent a few weeks nearly every year in the Canadian wilds or in the Black Hills of South Dakota and he brought home many trophies from these hunting expeditions, deer, antelope, elk, bear and mountain sheep. He also excelled in fishing and spent many pleasant vacations at the various fishing resorts. He has written several stories of his experiences on some of these occasions and they have been published in "Out Door Life" at different times.

The physicians in this vicinity will miss Dr. Johnston almost as much as the family he has left behind. There will always be a vacant place in our staff and medical meetings that no one can fill. It was a pleasure to know this man and to be counted as one of his friends.

As time goes on we will one by one go with the grim reaper to that farther shore whence none return, but happy will the meeting be when we meet our doctor friends over there.

W. A. BATES, M.D.

#### FRANKLIN H. STALEY, M.D.

Born January 5th, 1860. Died at his home at Vienna, S. D., April 2, 1932, of cerebral-hemorrhage.

Dr. Staley was born in Bucyrus, Ohio, later moving with his parents to Mt. Vernon, Iowa, where he attended Cornell College. In 1880 he came to Watertown, Dakota Territory, accompanied by his mother, Mrs. W. J. Clungstrom. He filed on a homestead northeast of Watertown, which he later sold to be able to pursue his chosen profession at Rush Medical College, Chicago, where he graduated February 16th, 1886. First he located for practice near Mt. Vernon, Iowa, later moving to Castlewood, S. D., where he practiced from 1887 to 1894. Clear Lake, S. D., 1894 to 1911. Grand Valley, Colorado, 1911 to 1914. Hazel, S. D., 1914 to 1917. Vienna, S. D., 1917 to 1932.

He married Violet Marshall of Castlewood,

S. D., 1890. To this union were born three children, Mrs. Winifred Waterman, Grand Valley, Colorado; Melroy M. Staley, Aberdeen, S. D.; William Staley, Youngstown, Ohio. Mrs. Staley died in 1902. Dr. Staley married Miss Lena Tetzlaff, June 15th, 1904. To this union were born four children, Marion F. Staley, Salada, Colorado; Margaret E. Staley, Duluth, Minnesota; Maxwell Staley, of Sioux Falls, S. D., and Eugene F. Staley, of Vienna, S. D.

Dr. Staley was a member of Phoenix lodge No. 129 A. F. & A. M., Clear Lake, S. D., and the Watertown District Medical Society. The South Dakota State Medical Association and the American Medical Association. Interment at Clear Lake, S. D., April 5th, 1932.

J. F. D. COOK, M.D.

## SOCIETIES

Program of the North Dakota State Medical Association

45th Annual Session at Grand Forks, N. D.  
June 1st and 2nd, 1932

(Subject to Future Changes)

Surgical Clinic—Conducted by O. H. Wangensteen, M.D., Professor of Surgery, University of Minnesota.

"Drainage in Appendicitis"—R. C. Webb, M.D., Chief Surgeon G. N. Ry., Minneapolis, Minn.

Open discussion.

"Laboratory Procedures of Practical Value to the General Practitioner"—L. W. Larson, M.D., Bismarck, N. D.

President's Address—H. M. Waldren, M.D., Drayton, N. D.

Report of Annual Registration—G. M. Williamson, M.D., Secretary, Board of Medical Examiners; Judge H. A. Bronson, Grand Forks, N. D.

"Etiology Course and Treatment of Anal Pruritis"—Harry F. Bayard, M.D., Minneapolis, Minn.

Discussion—R. W. Henderson, M.D., Bismarck, N. D.

"Ten Years' Experience with Insulin"—Russell M. Wilder, M.D., Mayo Clinic, Rochester, Minn.

"The Recognition and Treatment of Pulmonary Suppuration"—O. H. Wangensteen, M.D., Minneapolis, Minn.

Discussion.

"Some Relationship of Clinical and Insurance Medicine"—H. W. Cook, M.D., Vice-President N. W. National Life Ins. Co., Minneapolis, Minn.

"Diseases of the Blood"—H. O. Altnow, M.D., Minneapolis, Minn.

Discussion—J. E. Hetherington, M.D., Grand Forks, N. D.

"Eye"—Archie D. McCannell, M.D., Minot, N. D.

Subject (Not Announced)—E. P. Quain, M.D., Bismarck, N. D.

Discussion.

"Eclampsia"—E. M. Ransom, M.D., Minot, N. D.

Discussion—John H. Moore, M.D., Grand Forks, N. D.

"Internal Injuries Involving Internal Organs"—A. W. Ide, M.D., Chief Surgeon N. P. Ry., St. Paul, Minn.

"Diagnosis of Hyperthyroidism"—W. H. Long, M.D., Fargo, N. D.

"Veteran Legislation"—C. B. Wright, M.D., Minneapolis, Minn.

### SPECIAL PROGRAM

North Dakota Academy of Ophthalmology and Otolaryngology at Hotel Dacotah

3:30 P. M., June 1st, 1932

"Unusual Cases of Mastoiditis"—Axel Oftedal, M.D., Fargo, N. D.

"Mastoiditis"—H. E. Binger, M.D., St. Paul, Minn.

There will be a banquet on the evening of June 1st, in which prominent speakers will take part. There will be a golf tournament and elaborate preparations for the entertainment of the visiting ladies are being made.

R. D. CAMPBELL, M.D.,

Chairman, Program Committee.

The South Dakota State Medical Association Will Hold the Fifty-first Annual Session at Watertown, S. D.

June 20-21-22, 1932

The Watertown District Medical Society, a component Society will act as host. The local committee have assisted the State officers is perfecting arrangements for the scientific and entertainment features of the program. The House of Delegates and Council of the State Association will transact the business of the association the afternoon and evening of June 20th. The officers and general chairman of the local society have the arrangements well in hand.

The officers of the Watertown District are: President, J. H. Lockwood, M.D., Henry; Vice-President, A. E. Johnson, M.D., Watertown; Secretary, Wm. Duncan, M.D., Watertown; and General Chairman, W. G. Magee, M.D., Watertown.

The tentative program for the scientific sessions includes the following: W. M. Duke, M.D., Kansas, Mo.; H. M. Richter, M.D., Chicago, Ill.; Leo G. Rigler, M.D., Minneapolis, Minn.; J. E. Gonce, M.D., Madison, Wis., who will give clinics in the forenoons and papers in the afternoons. J. C. Ohlmacher, M.D., Vermilion, S. D., F. V. Willhite, M.D., Owen King, M.D., Aberdeen, S. D., will present papers.

The ladies' auxiliary will hold their twenty-second annual meeting June 21-22. South Dakota has the honor of being the first state to organize a ladies' auxiliary. The organization was perfected at Hot Springs, S. D., during the annual session of the State Medical Association, September 29th, 1910.

The Annual Association Dinner will be held June 21, at which time we will have as our guest Hon. H. G. James, President of the University of South Dakota.

The local committee have plans for Scientific and Commercial exhibits.

The South Dakota Academy of Otolaryngology & Ophthalmology, will hold their meeting during the convention.

Officers of the State Association, W. A. Bates, M.D., Aberdeen, President, and J. F. D. Cook, M.D., Langford, Secretary, have gone over the plans with the local committee at Watertown. The officers anticipate a large attendance this year, as the meeting comes at a vacation period. Fishing and golf will be in order. Plan your vacation at Beautiful Lake Kempeska.

J. F. D. COOK, M.D.,  
Secretary-Treasurer.

### NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Dr. B. L. Pampel, Livingston, Mont., has been elected president of the Montana State Board of Health.

Dr. L. G. Flannagan, a graduate of the University of Minnesota, has recently opened offices for practice at Austin, Minn.

Dr. W. L. Herbert has moved from Maynard, Minn., to Granite Falls, Minn., and opened offices for general practice.

The Whetstone Valley Medical Society held their April meeting at Milbank, S. D., with Dr. J. C. Ohlmacher, Vermilion, as guest speaker.

Dr. Williams J. Taylor, the first practicing physician to locate at Pipestone, Minn., in 1874, died last month at the advanced age of 88 years.

Dr. Eugene Hubbell, who had practiced medicine in St. Paul for the past 42 years, died on April 20th, after a brief illness, at the age of 77 years.

About 50 Minnesota nurses were in attendance at the annual meeting of the American Nurses Association, held at San Antonio, Texas, last month.

About 25 physicians were in attendance, accompanied by their wives, at the April meeting of the Swift and Kandiyohi Medical Society held at Benson, Minn.

Dr. and Mrs. Arthur C. Strachauer, Minneapolis, have returned home after several weeks vacation in cruising in the West Indies and South American countries.

Dr. J. G. Chichester, Redfield, S. D., who has been confined in a Chicago hospital for several months with a severe attack of arthritis, was able to be removed to his home a few days since.

Duluth is to erect a twelve-story building for the exclusive use of physicians and dentists at a cost of over \$1,000,000. It is to be completed early in 1933 and will be named Medical Arts Building.

The spring meeting of the Yankton District Medical Society was held at Vermilion, S. D., on April 28th with Dr. Harry L. Smith, Rochester, Minn., and Dr. George A. Skinner, Omaha, Neb., as guest speakers.

At the annual meeting of the Southwestern Montana Medical Society, held at Miles City last month, Dr. J. A. Evert, Glendive, was elected president, Dr. G. T. Haywood, Forsyth, vice-president, and Dr. H. J. Hall, Glendive, secretary.

Dr. A. C. Pohlman, professor of anatomy at St. Louis, Mo., University, has been named to succeed the late Dr. G. R. Albertson as dean of the school of medicine and professor of anatomy at the University of South Dakota at Vermilion.

"Personal Hygiene, the Care of the Body," will be the topic of the first May radio address by Dr. William A. O'Brien, professor in the medical school at the University of Minnesota. Dr. O'Brien broadcasts over WCCO at 11:15 a. m. every Wednesday.

Dr. M. B. Benjamin, Jasper, Minn., well known local physician, was seriously injured when his auto was struck by a Great Northern engine. The doctor was badly cut in many places, but if nothing new develops, it is hoped that he will soon be able to resume practice.

The Watertown District Medical Society held a meeting April 12th with Dr. B. A. Bobb, of Mitchell, presenting a paper on "Treatment of Ruptured Appendixes." Dr. A. Einar Johnson, of Watertown, was elected Delegate to the State Convention for 1932.

Dr. E. L. Hall, Princeton, Minn., died last month at the Veterans Hospital, Fort Snelling, where he had been confined during the past few months. Dr. Hall was a graduate of the University of Minnesota in 1902 and enjoyed a very large practice in that part of the state.

Drs. W. J. and C. H. Mayo, Rochester, were hosts to a large number of surgeons from the states of Tennessee, Virginia, Maryland, Alabama, Oklahoma, Texas and Kentucky, who rep-

resented the members of the Southern Society of Clinical Surgeons. The meeting occupied three days.

New treatments and new diagnostic methods are to be exhibited at the annual meeting of the Minnesota State Medical Association May 23 to 25 in St. Paul. It is planned to bring to the Minnesota meeting a large number of the exhibits shown at the American Medical Association convention in New Orleans.

The Aberdeen District Medical Society held their quarterly meeting at Aberdeen last month. Papers were read by: Dr. E. S. Watson, Aberdeen, "Intracranial Birth Injuries;" Dr. C. E. Lowe, Mobridge, "The Undescended Testicle;" and Dr. Frank I. Darrow, Fargo, N. D., "Some of the Latest Advances in Medicine."

The Sioux Falls District Medical Society held their April meeting at Sioux Falls, with the following interesting program being presented: Drs. Goeffrey Cottom, "The Management of Thyrotoxicosis;" Dr. A. E. Bostrom, "Public Health Matters;" Dr. W. C. Forsberg, "The Economic Waste of Medical Care," illustrated with lantern slides.

The Red River Valley Medical Society held their April meeting at Crookston, with the largest attendance of the season. Two technical discussions were given, one by Dr. H. O. Ruud, Grand Forks, on "Diagnosis and Treatment of Lateral Sinus Thrombosis" and one by Dr. Russell Gates, Minot, on "Case Histories and X-ray Diagnosis."

The eighth annual meeting of the North Dakota Health Officers Association was held at Bismarck on April 26th and 27th. A large number was present and a splendid program was presented for both of the two-day sessions. Dr. W. H. Moore, Valley City, is president, Dr. H. L. Halverson, Minot, vice-president, and D. A. A. Whittemore, Bismarck, secretary.

The Iowa State Medical Society will hold their eighty-first annual meeting at Sioux City on May 4, 5 and 6. A splendid program has been arranged for the three-day sessions and any information desired can be obtained by writing the secretary, Dr. R. L. Parker, Des Moines, Iowa. A cordial invitation is extended to members of the North and South Dakota State Medical Associations to attend this meeting.

Dr. E. C. Hartly, director of the bureau of child hygiene of the Minnesota state board of health, has been appointed Minnesota chair-

man of National Child Health day, which comes on May day this year. Dr. Hartley was appointed by a special committee of the State and Provincial Health Authorities of North America. Through the work of the health authorities in cooperation with the American Child Health Association the day will be observed by special educational programs on child health in all parts of the country.

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters). Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month of May will be as follows: May 4th, Personal Hygiene—Care of the Body; May 11th, Boils and Carbuncles; May 18th, Mucous Colitis; and May 25th, Fibroid Tumors of the Uterus.

The meeting of the Sixth District Medical Society was held at Bismarck, April 12, 1932. There were thirty-four members and nine guests present, including Dr. H. M. Waldren, Drayton, N. D., President of the North Dakota State Medical Association, Dr. P. H. Burton, Fargo, President-Elect of the North Dakota State Medical Association, Dr. H. E. Winchester, Dun Edin, Fla., Dr. C. J. Meredith and Dr. Wm. Campbell, Valley City, Dr. A. E. Hetzler, Richardton, Dr. L. B. Greene, Edgeley, and Dr. Brazda of Mandan. After a splendid dinner had been served, a short business meeting was held. The following program was then presented by Dr. V. J. LaRose of Bismarck, Chairman of the Program Committee: "Backache"—Dr. P. H. Burton, Fargo. Discussion by Dr. W. H. Bodenstab and Dr. V. J. LaRose. "Fractures of the Humerus"—Dr. R. H. Waldschmidt, Bismarck. Discussion by Dr. V. J. LaRose. "The Physiology of the Kidney"—Dr. R. W. Henderson, Bismarck. Discussion of the relation of the American Medical Association to the U. S. Veterans' Bureau and the American Legion—Dr. H. M. Waldren, Drayton, N. D. Dr. L. B. Greene, Edgeley, N. D., also discussed this subject.

The annual meeting of the Whetstone Valley Medical Society was entertained by Dr. and Mrs. A. P. Hawkins at their home in Waubay, S. D., April 11th, 1932. After dinner President, Dr. F. N. Cliff, called the meeting to order. The following officers were elected: President, Dr. T. A. Hedemark, Revillo; Vice-President, Dr.

A. E. Brown, Webster; Secretary-Treasurer, Dr. D. A. Gregory, Milbank; Censors, Dr. A. P. Hawkins, Wanbay, Dr. J. A. Jacotel, Milbank; Dr. Chas. Flett, Milbank; Delegate, Dr. A. P. Hawkins, Wanbay; Alternate, Dr. F. N. Cliff, Milbank. Drs. Walter Judge, of Milbank and Oliver M. Porter, Sisseton, were elected to membership. Dr. A. E. Bostron, Epidemiologist State Board of Health, DeSmet, and Dr. J. F. D. Cook, Secretary of the State Medical Association of Langford, were guests of the Society. The guest speaker, Dr. J. C. Ohlmacher, Professor of Pathology, School of Medicine, University of South Dakota, and Director of the State Health Laboratory, Vermilion, gave a lecture, "Certain Fundamentals of Cardio-Vascular Disease." Lantern slides were presented demonstrating pathology in Vascular Diseases. A vote of thanks was given Dr. Ohlmacher for his presentation of the subject. Also to Dr. and Mrs. Hawkins for their hospitality and entertainment.

Robert McGraw, negro quack of itinerant fame, has discovered, much to his sorrow, that he could not violate the terms of a suspended sentence given him last June at Glencoe, Minn. On June 12, 1931, McGraw entered pleas of guilty to two charges of practicing healing without a Basic Science Certificate and was fined \$225 and costs on the first charge and given a suspended sentence of one year in the county jail on the second charge. McGraw at that time expressed an ardent desire to return to his native state of Illinois. One of the conditions of the suspension of sentence required McGraw to refrain from the practice of healing in the state of Minnesota until properly licensed. The State Board of Medical Examiners discovered that in the fall of 1931, McGraw came into Lyon County and extracted the sum of \$250 in cash to cure an alleged case of cancer. At that time McGraw was located in Sioux City, Iowa. About the 1st of March, 1932, McGraw moved back into Todd County, and located on a farm some four miles northeast of Bertha. Following an investigation by the Medical Board, the court revoked the suspension of sentence and ordered McGraw committed to serve his one-year sentence. On April 5th, McGraw was arrested and returned to the McLeod County jail where he is now confined according to law. This is the first time since the enactment of the Basic Science Law in Minnesota that a quack has been ordered to serve the maximum sentence provided for a violation of the law.

## CLASSIFIED ADVERTISEMENTS

### X-RAY AND PHYSIO-THERAPY TECHNICIAN

Would like position in Hospital or Doctor's office. Six years' experience in physician's office. Also do bookkeeping and stenographic work. Address Box 905, care of this office.

### TECHNICIAN

Young lady technician would like position in Hospital, Clinic or Doctor's office. Experienced in X-ray, physiotherapy and all clinical laboratory procedures. Outside of Twin Cities preferred. Good references. Address Box 900, care of this office.

### CHOICE OFFICE SPACE FOR RENT

Choice office space for M. D. in Medical Arts Building in Minneapolis. Rent with office girl and telephone, \$75.00 a month. Address Box 906, care of this office.

### EXPERIENCED TECHNICIAN

Experienced X-ray and clinical laboratory technician desires position in Hospital or Clinic. Will combine with anesthetics. Also experienced bookkeeper. Excellent references. Address Box 908, care of this office.

### FOR SALE

Medical Practice and Drug Store, either single or together, splendid opportunity for young or middle aged practitioner. Good fishing and hunting. Address Box 911, care of this office.

### FOR RENT

Doctor's office in new medical building located in best business intersection of good residential district. Office is exceptionally well equipped. Individual treatment rooms, laboratory, free gas, free compressed air and large reception room. Take advantage of this opportunity. Address Box 907, care of this office.

### LABORATORY TECHNICIAN

Reliable and capable young lady technician desires position in Clinic, Hospital or Doctor's office. Experienced in X-ray, physiotherapy and all clinical laboratory procedures, basal metabolism, nursing and bookkeeping. Can furnish A-1 references. Address Box 909 care of this office.

### TECHNICIAN

An experienced X-ray, laboratory and physio-therapy technician would like position in Doctor's office, Clinic or Hospital. Can do typing, Basal metabolism and can give ether anesthesia. Good references. Address Box 904, care of this office.

### PHYSICIAN'S OFFICE EQUIPMENT FOR SALE

Office equipment of the late Dr. M. C. Johnson includes surgical instruments, microscope, diathermy, etc., all in splendid condition. Will sell at a sacrifice. Also finest hospital in the Northwest, located at Aberdeen, S. D. This is an opportunity worth looking into. Address Mrs. M. C. Johnson, 104 Twelfth Ave. N. E., Aberdeen, S. D.

LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD  
OF MEDICAL EXAMINERS, MARCH 1, 1932

BY EXAMINATION  
(January)

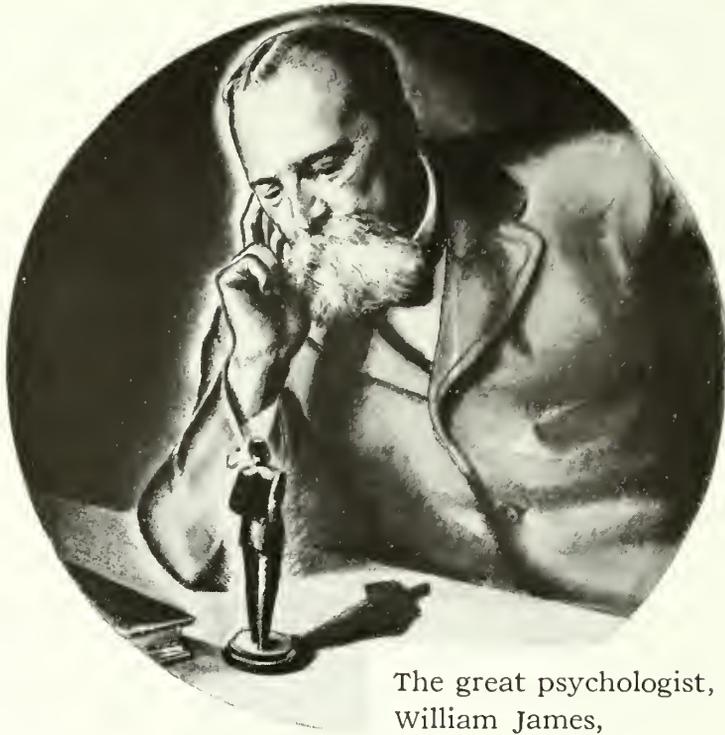
Name	School and Date of Graduation	Address
Albers, Edward Charles.....	U. of Pa., M. D., 1930.....	Mayo Clinic, Rochester, Minn.
Austin, Villairs Thomas.....	U. of Ore., M. D., 1929.....	Mayo Clinic, Rochester, Minn.
Andre, Hugo Carl.....	U. of Minn., M. B., 1931.....	3019 37th Ave. S., Minneapolis, Minn.
Baker, Abe Bert.....	U. of Minn., M. B., 1930; M. D., 1931.....	621 Oliver Ave. N., Minneapolis, Minn.
Beckman, Wallace Gerald.....	U. of Minn., M. B., 1931.....	Swedish Hospital, Minneapolis, Minn.
Biederman, Albert Alfred.....	U. of Minn., M. B., 1931.....	Mpls. Gen. Hosp., Minneapolis, Minn.
Blumstein, Alex.....	U. of Minn., M. B., 1930; M. D., 1931.....	335 St. Anthony Ave., St. Paul, Minn.
Cook, Norman Corrigan.....	U. of Man., Canada, M. D., 1930.....	Mayo Clinic, Rochester, Minn.
Danielson, Julia Hanson.....	Rush Med. Col., M. D., 1931.....	Litchfield, Minn.
Danielson, Lennox.....	Rush Med. Col., M. D., 1931.....	Litchfield, Minn.
Doroshov, George David.....	U. of Minn., M. B., 1931.....	1352 Goodrich Ave., St. Paul, Minn.
Faue, Clarence George.....	U. of Minn., M. B., 1931.....	1515 Charles St., St. Paul, Minn.
Freeman, Leonard, Jr.....	U. of Colo., M. D., 1929.....	412 4th St. S. W., Rochester, Minn.
Garvin, Robert Odell.....	U. of Pittsburgh, M. D., 1929.....	Mayo Clinic, Rochester, Minn.
Ghiselin, Alex. Dickinson, Jr.....	Columbia Univ., M. D., 1929.....	Mayo Clinic, Rochester, Minn.
Goodwin, Thomas Wright.....	U. of Georgia, M. D., 1930.....	Mayo Clinic, Rochester, Minn.
Hottinger, Raymond Creighton.....	Creighton Univ., M. D., 1930.....	Janesville, Minn.
Kettlewell, Ralph Burnsell.....	U. of Minn., M. B., 1931.....	Elysian, Minn.
Keyes, Howard Craig.....	U. of Buffalo, M. D., 1928.....	Mayo Clinic, Rochester, Minn.
Kirch, Walter.....	Royal Univ. of Florence, Italy, Diploma of Doctorate, 1925.....	Mayo Clinic, Rochester, Minn.
Kugler, Alex A.....	U. of Minn., M. B., 1931.....	Mpls. Gen. Hosp., Minneapolis, Minn.
Lansbury, John.....	Queen's Univ., Canada, M. D., 1926.....	Mayo Clinic, Rochester, Minn.
Martin, Melvin Sylvester.....	U. of Minn., M. B., 1930; M. D., 1931.....	Sedan, Minn.
McDonald, Angus Morris, Jr.....	U. of Pa., M. D., 1928.....	Mayo Clinic, Rochester, Minn.
Mork, Byron O., Jr.....	U. of Minn., M. B., 1930; M. D., 1931.....	Worthington, Minn.
Ouellette, Alfred Joseph.....	Loyola Univ., M. D., 1931.....	707 Fullerton Pkwy., Chicago, Ill.
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## Prognosis in Cardiac Diseases\*

WALTER W. HAMBURGER, M.D.

*Chicago*

**P**ROGNOSIS not only in heart disease, but prognosis in diseases in general was known to the ancients. Probably one of the oldest disciplines in medicine is prognosis. Many of you may know the classical book of Hippocrates called "The Prognostics," and if you don't I am sure it would be well worth your glancing through, because it is as applicable to present-day medicine as it was at the time of Hippocrates.

Rather naively, Hippocrates makes these points: He recommends to the physician the cultivating of prognosis for the three following reasons: first, to attract the confidence of one's patients; second, to free the physician from blame, by enabling him to announce beforehand the issue of the disorder about which he is consulted, and, third, to give him a decided advantage in conducting his treatment and preparing him for remarkable changes in the disease before they occur. It seems to me these three admonitions of Hippocrates are as applicable today as they were in his time.

Prognosis in heart disease, or prognosis in medicine in general, cannot be called a science; it is much more an art, and it is perhaps as unscientific or inaccurate a science as any part of the disciplines of medicine. But, to some extent, there is an accuracy in prognosis, and that accuracy depends almost entirely on the accuracy of the diagnosis. The more accurate and the more complete the diagnosis, particularly in ref-

erence to heart disease, the more accurate the prognosis.

Accuracy in diagnosis, to my mind, depends upon a number of quite definite points. First of all is the very careful taking of the patient's history. As the late Dr. Sippy taught many of us in his clinics at Rush for many years, careful analysis of the history of a patient with a gastrointestinal disease and the history itself are most important. Often his presentation lasted two or three clinic periods demonstrating one patient in the analysis of that patient's history. The same thing applies, almost to the same degree, to the history of a heart patient. A very considerable amount of information can be elicited from an intelligent patient by pertinent questions, not only as to the present complaint, but also the past history and everything that is included in the history of a heart patient.

Second, is the physical examination, in which accuracy of your observations is of greatest importance. Percussion; auscultation; the limits and position of the heart; the auscultatory findings of the heart tones, not only of murmurs; the appreciation of the rhythm of the heart; the appreciation of the color of the patient; how he comports himself; how he sits or lies in bed; how he walks; his manner of breathing, and his response to exercise and effort are all parts of a carefully conducted physical examination which contribute very materially to the accuracy of the prognosis.

\*Read before the Jubilee session of the North and South Dakota State Medical Associations, Aberdeen, South Dakota, June 2, 3, 4, 1931.

Third, are certain rather fundamental laboratory findings or examinations, which are perhaps of less importance than these three different types of examinations, but nevertheless, valuable. The blood pressure comes first perhaps which has a great prognostic significance, as all of us know: then, at least a single examination of urine and blood, temperature, and lastly, the electrocardiogram, the newest addition to our armamentarium for examination, which is to be taken only as a part of the general complete examination, and not to be taken by itself. Then possibly, even more recently, a basal metabolic rate determination in certain cardiac patients is important.

In the same way that the diagnosis of a heart patient means an evaluation and an integration of all this data gleaned from the history and physical examination and these laboratory tests, the same considerations apply to the prognosis. The prognosis which may be thought of as one step higher, means the evaluation and the integration of all the diagnostic findings. Prognosis takes perhaps the highest wisdom, the greatest and widest experience, and the keenest insight into both the pathology, as Dr. Boyd pointed out, and the physiology of the heart.

I might mention in quite a categorical fashion a few things which seem to me may be helpful in arriving at a prognosis in general terms. I have listed these in three categories: First, symptoms or findings which indicate a good prognosis, findings which are of themselves of slight importance, of slight significance from the standpoint of recovery of the patient or of continuation of life; Second, those findings which are of greater significance and in which the outlook is more serious; and, finally, those in which the outlook is grave.

In the first group, these findings which are of slight importance, I mention first the so-called sinus arrhythmia. By sinus arrhythmia we mean the simplest type of arrhythmia which we all can demonstrate, which is particularly present in childhood, which on inspiration allows the heart to beat more rapidly and on expiration more slowly. It is often called juvenile arrhythmia or respiratory arrhythmia, but it is of practical importance because frequently we see, (I certainly have seen a number), children who have been kept in bed and treated for organic heart disease simply because some one has demonstrated a perfectly physiological sinus arrhythmia. It can be demonstrated to be that, very easily, by simply having the child or patient inhale slowly, watching the pulse rate, listening to the heart, and not-

ing the accompanying bradycardia on slow expiration. It is a perfectly physiological finding, with no pathological significance. Its absence is of more importance than its presence.

The common complaints of palpitation and tachycardia which patients complain of to us are, for the most part, of no importance or of relatively slight importance. They are often of nervous origin, and many patients who complain of a rapid pulse have a slow pulse in fact, and patients who complain of palpitation have a slow pulse and a normal rhythm. Of course, palpitation and tachycardia associated with other findings and complaints may have a greater significance.

A very common complaint on the part of patients, and one which is usually of little significance, is extrasystoles. The patient complains of a sudden, unexpected unique sensation in the region of his heart, variously described as a "twist," a "thump," or "bump" of the heart; "the heart feels like it is turning over," "has missed" or "dropped" a beat, as he calls it. It occurs at any time; it often interferes with sleep, and the patient is very much alarmed. In women it often occurs during pregnancy. In men it often occurs following a bout of alcoholism, excessive use of coffee or tobacco, fatigue, and so on.

You all know extrasystoles! They are premature beats arising from any part of the heart. They of themselves are usually of little pathological significance. They can be controlled to some extent by quinidine, sometimes by bromides, by hydrobromide or quinine, or they may continue indefinitely for years, uninterruptedly, and cause no serious consequences. But they, like palpitation and tachycardia, associated with other findings, may have a much greater significance.

Continuing the discussion of symptoms and signs associated with a good prognosis, patients complain of a sudden rapid beating of the heart and a sudden cessation—the auricular paroxysmal tachycardias. Such episodes have usually a favorable prognosis.

The heart symptoms following influenza are likewise usually transient, they clear up and are of little permanent organic significance.

Then there is the general group of cardiac neuroses, the so-called irritable heart, or neuro-circulatory asthenia, all synonyms of the same clinical picture, the anxiety neuroses. They are of no importance pathologically. They are of great importance to the patient, and can, as a rule, be helped or cleared up by treatment directed

to the underlying psychology or psychiatry of the patient.

The second group, of greater significance than these I have listed are, the rheumatic, the hypertensive, the congenital, syphilitic, thyrotoxic, heart disease, all organic involvements of the heart. Valvular heart disease, however slight, mitral or aortic, is an organic involvement of the heart and has potential possibilities of future trouble. Auricular fibrillation and auricular flutter, while often controllable, are of much greater significance, than extrasystoles.

Angina pectoris, usually occurring in old age, but occurring frequently at younger age, may have a very grave prognosis, but under good management, and without a progression of the disease, the patient may go on from five to ten, fifteen, twenty-five, and even thirty years leading a fairly active life.

Findings of real gravity, outspoken gravity, in which the outlook for life is a question of months or years, are: first, the disease that Dr. Boyd so beautifully showed this afternoon, bacterial endocarditis, subacute or acute. It has, so far as we know, always a fatal look. I was interested to hear him say that he believes the cure of this disease will certainly be found. While the frequency of bacterial endocarditis is fortunately not very great, the man who finds the cure will rank with Pasteur and Koch and other great names in medicine, because in spite of many methods of treatment, none is effective.

I was asked at lunch today if there is anything new in bacterial endocarditis. There is nothing new; there is nothing which in the least modifies the steady, progressive, downhill course of bacterial endocarditis, be that course rapid or slow. The prognosis is 100 per cent fatal, at least in my experience. There have been men, particularly Libman in New York, perhaps Capps in Chicago, competent observers, who say they have seen recoveries. It just happens to be my misfortune never to have seen that happen in any patient of mine.

Coronary thrombosis, occlusion of the coronary circulation, has a grave outlook always. The patient may survive a year, three years, five years, or even ten years, but nevertheless occlusion of the coronary is to be taken exceedingly seriously, and of course death may be instantaneous or within a few hours.

The finding of so-called gallop rhythm, instead of two tones at the apex, there are three, as in the gallop of a horse; whether that is a pre-systolic, diastolic, or proto-diastolic gallop or canter,

is of ominous significance. It is often found in hypertensive hearts and failing hypertensive hearts, and, in my experience and I think in the experience of most men, has a serious outlook.

The alternating pulse, *pulsus alternans*, which, as Dr. Herrick first pointed out, can be identified easily by the sphygmomanometer, is always grave. I was interested in hearing Dr. Williamson speak of practicing in small communities. While I have never practiced in such communities, such practice has always interested me and has my greatest sympathy. I think the refinements of hospital and metropolitan practice should be such that the results can be used by all practitioners in country or in rural communities. This knowledge should be at our finger-tips, to be used at the time of emergency. This is particularly true of *pulsus alternans*. With a simple blood pressure cuff you can identify beautifully the alternation of the radial pulse in which alternating beats come through at different levels. An alternating pulse is of greatest gravity. The patient can survive at most only a year or two, usually a much shorter period.

Heart block, with complete auricular-ventricular dissociation, or block of one of the branches of the bundle of His, associated or not associated with the syncopal attacks of the Adams-Stokes syndrome, is always of grave significance.

Then, finally, a rapid beating of the heart not due to auricular flutter and not due to auricular tachycardia, but a nodal or ventricular tachycardia, is usually of grave omen.

#### DISCUSSION

DR. WILLIAM C. NICHOLS (Fargo, N. D.): Mr. Chairman and Members of the Society: I am awfully sorry that Dr. Hamburger could not have finished his systematic presentation. He was just getting down to the tail end of it to show you some graphic explanations of some of the things that he had mentioned.

Dr. Hamburger is one of the outstanding heart men in Chicago and his contributions to heart work have been excellent. He has done a considerable amount of experimental work. Some of his work in coronary disease is outstanding. He was one of the pioneers to work on coronary occlusion.

In preparing to discuss Dr. Hamburger's paper I was aware that I could add nothing to it, so I jotted down a few personal experiences that I thought might be of interest, if not instructive.

Some years ago Willius, of Rochester, did some pioneer work, the most comprehensive work done up to that time, on the significance of T-

wave inversions in cardiograms. I think all of us who work with laboratory facilities finally become more dependent on them than we should. We substitute the mechanical for the art of medicine, but the work of Willius laid down some pretty definite laws as regards the prognostic significance of T-wave inversions, what he called significant T inversions in the electrocardiogram. The significant T-wave inversions are the inversions with T down in I, T down in II and III, T down in I, II and III, T down in Leads II and III. The inversion in Lead III is not significant as it occurs in normal cardiograms; it is not significant unless it be associated with notching of the Q. R. S., complexes, or other abnormalities.

We have 2,925 cardiograms. We have been in the habit, in hospital cases, of running serials on the coronary thrombotics if they will stand it, and are in condition to tolerate it. We run them every day, or as often as we can. On the fibrillations and many of the decompensations we run them frequently. We will cut that 2,900 down by 1,771 for duplications, leaving us 1,154 individual, separate cardiograms. Of this number, that is 239, or about 20 per cent of all cardiograms run (and we run a lot of them that are not indicated, as we run cardiograms in making complete heart examinations on all thyroids and all old people, particularly operative), have significant T-wave inversions: T I, 96; T I and II, 47; T inversion in I, II and III, 29; T inversions in II and III, 67. Those run over about five years.

We have not classified this entirely accurately, but I can safely say that the majority of those cases that are more than two years old, except in Leads I, II and III, which for some reason or another don't comply with the theoretic rule, are dead after two years.

We have followed some of these, and I am just going to report a few cases to show how interesting some of these T-wave inversions may be on follow-ups.

We have had thirteen coronary infarctions, thirteen separate ones. Of these, one died at once, six died after we had been aware of a T-wave inversion, one lived for three and a half years, all in Lead I, one for one year, one for one and a half years, one for two years, and one for one and a half years. We had one that lived four years after the first T-wave inversion and then died from a coronary infarction. That one also typified what Dr. Hamburger said this morning—occasionally in a real angina pectoris the

electrocardiogram is of no significance because it may be normal.

We had one woman, I think it was close to five years after diagnosis was made of a clear-cut definite angina, an effort syndrome, a Heberden syndrome, who died with a classical coronary infarction, and during that period her cardiograms had been normal three or four times during three or four or five years.

We have one living one and a half years, one five years, and we have two in the hospital at the present time on whom diagnosis was made in the last month. So you see the significance of these T-wave inversions, not only as a matter of prognosis as regards life, in the ordinarily accepted terminations of congestive type and anginal type failure, but it helps with these dramatic coronary infarctions, and coronary infarctions are certainly dramatic.

He had the etiological classification, and finally he got down to what he called the physiologic. I have had a hoodoo as far as some of those things are concerned. I have got to the point that any time a fibrillator comes in, regardless of etiology or present condition, I immediately lay plans to tell the family that this person is sitting on a volcano and something may happen.

We had five femoral emboli in fibrillators. One woman had an embolotomy without result. They all died, all five of them. Strange to say, fibrillators in the degenerative types are not supposed to be nearly so prone to this reaction as are the rheumatic type, particularly the fibrillators in mitral stenosis where the appendages fill up.

It is often said that the emboli usually come after a period of quiescence after treatment. In one of these it didn't, but in the others, who had quieted down, and apparently had recompensated, and were still fibrillating, the rate had dropped considerable, and yet they had these emboli. The woman who had the embolotomy finally died with a cerebran embolus.

As an illustration of what might be called extra-cardiac accidents or death, those cases call attention, I hope, to the possibility of trouble.

We had another femoral thrombosis, fortunately in a subacute bacterial endocarditis who was all through anyway. She was about dead, and it is the only subacute bacterial endocarditis I ever saw fibrillate. That was the terminal shock that finished her off.

The same thing maintains in a pure mitral stenosis without fibrillation. A mitral stenotic, regardless of rate, regardless of compensation, is subject to this sort of accident.

I remember one case that I had who had what was apparently a kidney infarction. We tried to make a subacute bacterial out of her and failed. One of my colleagues finally got her, and she was posted with another embolus cerebrally. She only had fibrillation in poraxysms.

Those are some of the extra-cardiac things that one must bear in mind.

When we start in with an etiologic classification of these hearts, I think that is the most important way to consider it; to consider the prognosis on age and sex and environment, financial condition; all those things which really resolve themselves into the etiology. We make a rapid orientating classification that gets away a little bit from the classification of the American Heart Association. In going over hearts rapidly, we classify them thus: Are they congenital? Are they inflammatory? Are they rheumatic? Are they the bacterial type? And then we take the degenerative type. I am in the habit of putting into the degenerative types, the hypertensive types with or without sclerosis, and the primary sclerotics which are scleroses which never have high blood pressure and which really are an evidence of senility.

Strange to say, the sclerosis in these may be confined pretty thoroughly to the heart without much evidence of peripheral sclerosis or the retinal sclerosis or the cerebral sclerosis so commonly associated with the hypertensive types. In fact, I am inclined to think that we overlook a lot of sclerotics in younger people, and I think that accounts for the fact that so many people are prone to describe decompensations on the basis of rheumatic mitral insufficiency.

I question very much whether a pure mitral insufficiency without myocardial damage ever decompensates. If they decompensate, they have something else. I am sure the mitral murmurs that we often hear in hearts that are not enlarged, but have a little blow at the apex suggestive of mitral disease, are hearts in which there is beginning an early, sometimes as early as in the twenties, arteriosclerotic change that give these findings. Ultimately they decompensate, but I don't believe many of them are primary mitral insufficiencies on a rheumatic basis.

As Dr. Hamburger said, the prognosis in the subacute bacterials is notoriously bad. The minute you make the diagnosis you can almost offer a prognosis. Sometimes, however, it is difficult to discriminate between the cases of pancarditis with profound anemia and a little kidney involvement, and these subacute bacterials in the bacteria free

stage. It doesn't make much difference, because those cases that have had recurrent rheumatic attacks, with pancarditis, are bad anyway.

We think we have, out of about ten subacute bacterials, one in which we got a pure culture of the influenza bacillus. We think he was a subacute bacterial living for four years. We got cultures. He had evidence of embolic phenomena—spleen, hematuria, and he even had some petechiae, and tender toes and fingers. The diagnosis may have been a mistake. The culture may have been contaminated.

So much for the inflammatory type. Now we get down to the degenerative type. I think the vast majority of the ones that I see are hypertensive in type, excluding the rheumatic type. I don't see many of the rheumatic types. I think we are fortunate here that we don't have many children with inflammatory rheumatism.

In those hypertensives we sometimes can make a prognosis without any rhyme or reason simply on a cardiogram. It is surprising, sometimes, how a fellow comes in with tremendous pressure, is referred for operation, and has an inverted T-wave. We have watched some of those over several years, without any complaint. Of course, when you get those hypertensives, you have a lot of other factors to consider. Your blood chemistry determines whether they already have kidney involvement. Your retinal vessels determine whether they have the malignant type of hypertension so well described by Keith and his colleagues at Rochester. They, by the way, have correlated their retinal findings with their prognosis in myocardial damage, and there is quite a strict parallel in those cases with those in the malignant type of change.

If they have strict evidence of malignant type hypertension, they are almost through anyway, and they probably will die a combination death between heart, vascular, and kidney, without any one being outstanding. It may be thought that they are cerebral deaths because the arterial change cerebrally may indicate they have had a rupture or something of the sort.

The small hearts are a little different. Willis and Barnes have done some excellent work on that, and they find that that particular type of heart, in which anginal attacks are very obvious and recognized clinically, is very apt to show a cardiogram that is quite normal, strange to say, and post mortem will show a tremendous amount of arterial narrowing.

The exact explanation of that—why the deviation or the change in the line of the hyperten-

sives and of the primary sclerotics should be so different—nobody has ever explained. In fact, I think there is a good deal of explanation lacking in figuring out any of these coronary things. Someone is going to come along soon with a more adequate explanation.

Barnes has shown lately what he calls predominant left or right strain, a predominant left strain being with a T-wave inversion in I and II, and a predominant right strain in Leads II and III. Some of these hearts with II and III are hard to explain because obviously they are hypertensive, but possibly there is some obstruction in the right circuit which gives them that thing; they have proved to be predominantly that sort of strain in the majority of instances.

I have been in the habit of putting syphilis prognostically under the degenerative types. Syphilis, cardiologically speaking, is an aortitis; it is not a heart disease primarily. The pathology starts in the mediastinum, enters through the vasa vasorum into the aorta, and soon it is an aortitis. An aortitis sometimes can be recognized before there is any change.

When the cases go along to the stage where there is valve distortion, they are pretty far advanced. A specific aortitis is prognostically bad, particularly when a syphilitic heart with an aortic insufficiency is once decompensated. It may be a year or two, or it may be more, but they are about through.

On the other hand, a diagnosis may be made

by exclusion at the time they get the first aortitis. Dr. Willius does it commonly. That is the time, if they are not treated too intensively, that they go along.

So far as we are concerned, we probably have missed a lot of specific hearts. We have of record only six in which we have made a positive diagnosis, and they were all dead within two years except one. We saw one in January in which we made a provisional diagnosis of beginning aortitis and he is still alive.

The thyroid heart is quite a different proposition. That is mostly a surgical or medical problem, for the medical men in charge of thyroids, and for the surgeons to prepare the cases for operation. It is astonishing what a thyroid heart will do. I recall one old fellow of seventy years who had been decompensated chronically for about four years, as near as we could get from his history. We started in the time-accepted method to recompensate him on the basis that he was a primary arteriosclerotic, because he didn't have much enlargement, his blood chemistry was all right, his kidney function was fine. But we didn't get far with him. It is fortunate we didn't do him a lot of harm, because in those cases digitalis is certainly contraindicated. I came to after four or five days or more of puttering around and had a basal on him. He was a plus 30, and as soon as he had a little thyroid management and was operated, he went out under his own power.

## Thoracoplasty and Childbirth

J. P. HIEBERT, M.D., and D. R. HASTINGS, M.D.

*Minneapolis*

**F**RIEDRICH MOSLER, who performed a thoracoplasty in 1907, is the pioneer in this development of medical science. Sauerbruch, Brauer, Jacobaeus, Alexander, and others made marked advances in the field of lung surgery, particularly in thoracoplasty in tuberculosis, but this type of operation gained little favor until the World War.

Although thoracoplasty has been done for more than twenty years, we find in reviewing the literature on this subject that childbirth is rare in women who have previously had a thoracoplasty. There are but a few cases reported. One was reported by Saye in 1926, another by Jessen in 1929, and two by Busch in 1930. The authors add one more to the list.

The patient, a white female, was sixteen years and nine months of age when she was admitted to Glen Lake Sanatorium on December 10, 1924. She gave a history of malaise beginning in February, 1924, and of pneumonia in November, 1924. It was while she was under treatment for the pneumonia that a sputum examination was made and tubercle bacilli were found.

The symptoms present on admission to Glen Lake were slight cough and expectoration, occasional temperature of 101°, pulse 72 to 100. The diagnosis of moderately advanced (b) pulmonary tuberculosis was made. The X-ray read by Dr. R. Gates was: "Dense fibroid pulmonary tuberculosis right upper lobe with a small area of infiltration extending out to the right hilus

and slight but definite fibroid tuberculosis, atypical, to third and fourth interspaces on left side." The sputum was positive for tubercle bacilli.

In March, 1925, patient had an attack of pleurisy, and a month later she had a pulmonary hemorrhage of two ounces. She streaked heavily in May, and in July she had another attack of pleurisy with a rise in temperature to 103°. This fever lapsed in about a week, and the temperature remained normal with only a very occasional rise to 100°.

The treatment from admission to July, 1925, was bed rest with alpine lamp treatment for gastro-intestinal disturbance. X-ray plates of the chest made on June 19, 1925, showed "a cavity breakdown in the infiltration in the right upper lobe. No change in the condition of the remainder of the right lung. The mottled fibroid lesion in the third and fourth interspaces on the left side has entirely cleared up but there is still a slight increase in the lineal markings over this area."

Artificial pneumothorax was instituted on the right side on June 30, 1925, because of the progressive lesion on the right with cavity formation and pulmonary hemorrhage. A satisfactory collapse was obtained. Sputum became very scant and negative, then absent. However, in September, 1925, pleural fluid developed on the pneumothorax side. This was first aspirated in December, 1925, and was found to be seropurulent. The cell count ranged from 1,800 to 42,000. A guinea pig inoculated with the pleural exudate developed tuberculosis. At intervals of four to fourteen days from the time of first aspiration until August 27, 1927, fluid was extracted, the chest irrigated with normal saline solution, and glycerin in formalin (2%) injected into the pleural cavity.

In an effort to obliterate the empyema cavity and collapse the apical cavity in the right lung, a posterior upper stage thoracoplasty was done on June 23, 1927. Segments of the first six ribs were removed, beginning with the sixth. This gave considerable collapse of the apex of the right lung. A second stage posterior operation with removal of the seventh to eleventh ribs, beginning with the eleventh, was completed on July 27, 1927. The patient had an uneventful post-operative course.

X-ray plates taken on October 10, 1927, showed "the left lung unchanged and most of the fluid in the right pleural cavity disappeared." Plates made on January 24, 1928, showed "no change in

parenchyma of either lung but some regeneration of ribs on the right side."

The patient was worked up on graduated exercise in routine manner and left the hospital as "Improved" on May 12, 1928, with one hour and fifteen minutes exercise. Her general condition was excellent. All chest symptoms were well controlled by her collapse. The X-ray showed no change in the parenchyma of either lung. It was felt that she should continue to work up gradually on exercise, and that under supervision her prognosis was entirely favorable.

A few weeks after her discharge we increased her exercise to that of a normal person thereby permitting her to do housework and participate in other activities. Patient subsequently married and continued to live a normal life. When she became a maternity patient on January 30, 1931, she presented a very healthful appearance. Her L. M. P. was November 15, 1930, and her only disturbance since then was slight nausea with occasional vomiting in the morning. She was 5' 4½" in height and weighed 126 pounds. (Her lowest recorded weight during her active tuberculosis when she was last able to walk to the scale was 72 pounds.) The blood pressure was 115 over 70, pulse 78, temperature 98°, hemoglobin 72%, urine normal. The pelvic examination showed the following: External—Diameters Interspinous 25, Intercristal 26½, Intertrochanteric 32, Baudelocque 19½, no bony irregularities. Internal—Uterus in normal anterior position, freely movable, symmetrically enlarged, soft in inconsistency, in size and conformity suggesting a ten weeks' gestation. The Cervix was soft, smooth, nulliparous. Adnexae were normal.

The patient was very co-operative and willing to carry out every suggestion to maintain her health during her pregnancy. She presented herself at regular and frequent intervals for observation. Her gain in weight from January 30, 1931, to within a few days before Parturition was 28 pounds—the final recorded weight being 154 pounds. She developed no complications of pregnancy, urine and blood pressure remaining normal throughout. The usual anemia of pregnancy was noted, the hemoglobin going to a low of 60%. This was combated with hygienic and dietetic measures reinforced by the administration of iron and liver preparations.

On September 1, 1931, at 8 A. M. patient first noted the onset of Labor with definite Uterine pains at regular intervals. The first examination at the hospital at 11:20 A. M. showed the fol-

(Concluded on Page 331)

## Bilateral Spontaneous Pneumothorax\*—A Case Report

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University of Minnesota  
Minneapolis*

L. B., a white male—aged twenty-eight years, was admitted to the medical service of the Students' Health Service at the University of Minnesota on November 11, 1931, with the chief complaint of a pain in the chest over the precordium. This pain was of two days' duration, knife-like in character, and synchronous with respiratory motion.

The patient had been treated for maxillary sinusitis at the Health Service dispensary since February, 1931, and had undergone a window operation of the right antrum on October 29, 1931. Convalescence following this operation was uneventful up to the fifth night, when the patient awoke at three o'clock in the morning complaining of pain over the heart. Physical examination of the chest at that time was negative, except for scattered, coarse, moist rales which had been noted prior to operation. Subsequent fluoroscopic examination revealed no abnormal findings. This pain seemed transitory, and the patient was discharged from the hospital on November 4, 1931. Returning to the out-patient dispensary for observation, the patient again complained of the occurrence of precordial pain as has been noted as his chief complaint upon re-admission to the hospital on November 11, 1931.

*Physical Examination*—Upon admission, the patient was apparently not very ill. There was no cyanosis nor any dyspnea while at rest. The

\*Read before the Medical Staff, Lymanhurst School for Tuberculous Children at Minneapolis, Minn., December 22, 1931.

temperature was 98.2, respiration 16, and pulse 82.

The general examination was negative except the chest. Upon inspection, the right side of the chest was found to be expanded. There was widening and bulging of the intercostal spaces and decreased respiratory motion on that side. Tactile fremitus was diminished over the right side but no such change was noted on the left. On percussion, the right side was found slightly hyper-resonant as compared to the left. The position of the heart was apparently normal. Auscultation revealed a marked decrease of breath sounds over the entire right side except laterally near the base. Bell tympani and decreased vocal resonance were noted over the right side.

*Fluoroscopic, X-ray Findings, and Laboratory Reports*—Fluoroscopic examination revealed almost complete pneumothorax on the right, with only slight respiratory motion remaining in the middle lobe. Diaphragmatic excursion was extremely limited on the right. There was only very slight displacement of the mediastinum to the left.

The stereographic plates taken on November 11, 1931 (Fig. 1) showed an extreme pneumothorax on the right side with a small amount of the middle lobe of the lung visible. The mediastinum was displaced slightly to the left. A small

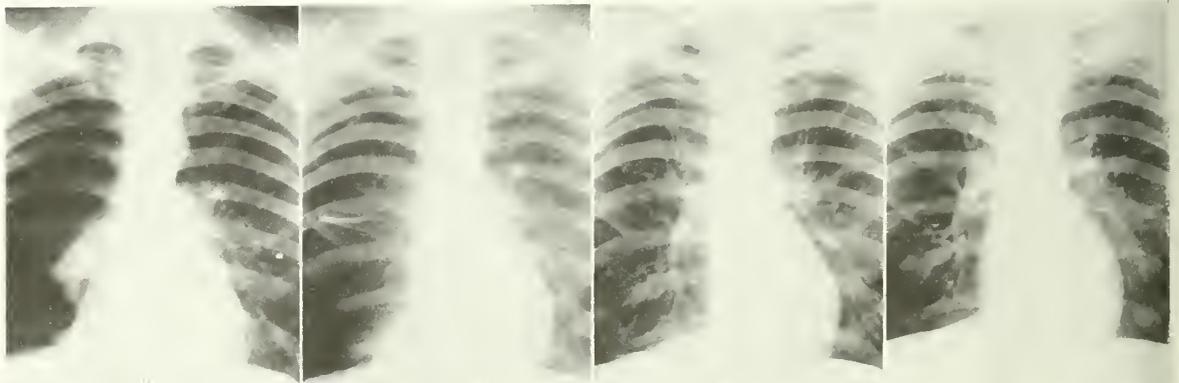


Fig. 1

Fig. 2

Fig. 3

Fig. 4

pneumothorax was also shown at the apex on the left side of the chest.

Urinalysis—negative	Tuberculin Tests (Mantoux)
Blood	.01 mg. negative
Hemoglobin . . . . .82	1.00 mg. negative
White Blood Cells . . . . .16,650	
Differential Count	
Polymorphonuclears . . . . .69	
Lymphocytes . . . . .26	
Eosinophiles . . . . .3	
Mononuclears . . . . .2	

*Diagnosis*—Upon this evidence, a diagnosis of bilateral spontaneous pneumothorax was made. There was some evidence to suggest a probable lower respiratory infection but no demonstrable proof of tuberculosis.

*Treatment and Progress*—No specific treatment was attempted. With bed rest, the patient was free of symptoms. The progress was noted by means of repeated fluoroscopic and X-ray examinations as well as physical examinations. An X-ray on November 18, 1931 (Fig. 2) showed the pneumothorax on the right side. There had been considerable expansion of the lung. Four lobes on the right side were clearly shown, there being an accessory medial lobe at the base. The upper and middle lobes were closely adherent with a thickening of the pleura. The pneumothorax on the left was almost completely absorbed. There was marked obliteration of the costophrenic angles on both sides.

The patient was discharged at this time with instructions to rest at home and return for regular observations. X-ray examination on December 8, 1931 (Fig. 3) revealed no pneumothorax on the left side. The obliteration of the left costo-phrenic angle had cleared up. There was a moderate pneumothorax still present on the right side, with some collapse of the upper lobe. The lower lobe was almost completely expanded. Adhesions were evident at the right base, and there was a suggestion of a small amount of fluid still remaining there. On January 4, 1932, an X-ray (Fig. 4) showed no evidence of pneumothorax on either side. There was a suggestion of the anomalous lobe at the right base. There was no evidence of any parenchymal pathology in either lung. The only remaining symptom that the patient complains of is sharp pain over the right side with very deep breathing, probably due to diaphragmatic adhesions which the fluoroscope reveals.

This case is reported because of the comparative rarity of bilateral conditions of this type, because of its more or less classical onset and

course, and because there was no evidence of a tubercular process. The anomalous lobe of the right lung as demonstrated by X-ray was another interesting, though incidental, finding.

## THORACOPLASTY AND CHILDBIRTH

(Continued from Page 329)

lowing: Uterine contractions fairly strong at eight-minute intervals. Rectal examination showed the Cervix soft, fairly thin with 3 cm. dilation. Vertex presenting in O. L. A. position. Membranes intact. At 1:40 P. M. patient was given 1/6 gr. Morphine Sulphate with 2cc. 50% MgSo<sub>4</sub> Sol and at 2:30 P. M. 20 gr. of Chloral Hydrate and 20 gr. Sodium Bromide was administered per rectum. Pain relief was very satisfactory and patient rested nicely with short naps between contractions. At 5:30 P. M. examination showed complete effacement of Cervix with full dilations and the Vertex well below the spines. Contractions very effective. G. O. E. with a minimum of Ether was now given, to the analgesic degree, from 5:50 to 6:25 P. M. at which time a spontaneous delivery occurred following a deep left oblique episiotomy. The baby was normal, weighing 7 pounds and 14 ounces. The Puerperium was entirely uneventful, the highest recorded temperature being 99<sup>+</sup>. Patient's weight on discharge from the hospital was 132 pounds and the baby's 8 pounds and 2½ ounces. A recent examination of the chest reveals as far as can be seen that no change has taken place in the chest findings or in the patient's physical condition. Her present weight is 136 pounds, and she is in splendid health.

In conclusion, we should like to emphasize the points we consider important in thoracoplasty in childbirth. (1) At least five years should elapse after the operation before childbirth should take place. (2) Extreme care, hygienic living, and plenty of rest should be advised during pregnancy. (3) The method of delivery should be one that is easiest on the mother. (4) Children should be at least five years apart, and no matter how good the mother's condition may be we believe that there should never be more than two children.

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## Social Insurance

EDWARD H. OCHSNER, M.D.

*Chicago*

WE come now to what is probably the weakest spot in the government—the judicial interpretation of the laws and their legal administration. Some of the worst features in the administration of criminal justice in particular, in most of the states and sometimes even in the federal courts, result from countless postponements, hair-splitting technicalities, innumerable appeals, and numerous reversals with its resultant delays and miscarriage of justice. Volumes could be written on this subject alone but one illustration of each method of delaying justice will have to suffice.

A known gunman has been indicted six times in the last eighteen months. Every time he has been released on bonds he has been involved in new crimes. In spite of all this he was given thirty continuances on the first indictment. Commenting on this and many similar cases, Henry Barrett Chamberlin, Operating Director of the Chicago Crime Commission, recently made the following statement:

"Repeated postponements in the trial of a criminal case is the most serious obstacle in obtaining a just verdict."

The following is an illustration of how intense legalism and the glorification of technicalities only too often defeats justice. The case is taken from the decision of the Illinois Supreme Court Volume 258. This decision was handed down many years ago but it still stands. An eleven-year old girl was dragged into a basement apartment and mistreated by a fifty-year old man. He was found guilty and sentenced to the penitentiary for five years. The Supreme Court reversed the sentence not because of any doubt concerning the defendant's guilt but because the child's first name had been set forth as Rosetta instead of Rosalia in the indictment.

In most major criminal cases in nearly all of the states of the union the convicted person has three and sometimes even more chances of appeal and one or two chances of executive clemency. Each time he has a chance to find a loop-hole and to make his escape while society is denied an equal chance to protect itself.

Our laws have been so emasculated by mollycoddle reformers that it is almost impossible to convict a criminal and keep him convicted or to convict one or a group of men who maladminister

government departments. A case in point. Between the years 1915 and 1919, four real estate experts were paid \$2,736,868, out of the city treasury. It was common knowledge that the payments were grossly excessive and that a good deal of this money ultimately found its way into the political fund of the administration and yet the Supreme Court reversed the verdict of the Circuit Court which had found the defendants guilty because it claimed that the prosecution had not proven that any member of the administrative body had personally received any of the money. To the laymen the language of the Supreme Court seems to say that if the administrative officer chooses to look in the other direction when the money is being stolen he cannot be held responsible. I do not presume to criticise the courts in these decisions, the fault may be in the laws, but no one will claim that all this spells governmental efficiency, and that is the point under discussion here. In this connection I wish to quote a jurist who was known for his outstanding fearlessness and integrity and his profound knowledge of the law. He characterized the Municipal and Circuit Courts as the Courts of Original Error, the Appellate Courts as the Courts of Intermediate Speculation and the Supreme Court as the Court of Ultimate Conjecture.

We have devoted this much space to the discussion of governmental inefficiency because it is fundamental. If we have demonstrated that most governments are inefficient or corrupt and that some are both and that there is no likelihood of marked improvement in the immediate future, then we have proven that it would be unwise and unsafe to entrust so vital a function as the almost universal control of medical practice to governmental supervision and control. If one were to record all the evidence of inefficiency and corruption which occur in all the governmental units of this country in one year alone it would require volumes instead of a few short articles.

The purpose of these articles, however, is not so much to give detailed information as to arouse the allied professions of medicine and dentistry and through them the general public to the impending danger.

(The next two articles will show how the quality of medical services deteriorate under Compulsory Health Insurance.)

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CONQUEST OF PNEUMONIA

It is especially interesting to this section of the country, where pneumonia heads the list of acute diseases in mortality statistics, to learn of an "arbeits" along the lines of its amelioration by highly reputable research workers, the results of which, up to the present writing, sound very promising indeed.

It is reported that an enzyme has been discovered which dissolves the capsule of type III pneumococcus, transforming it into type I, thus changing a disease from the most, to the least virulent form.

This announcement was made at the San Francisco meeting of the American College of Physicians in April and we eagerly await its appearance in print. The story of the search alone, would make good reading. It was logically conceivable that if such a solvent were available, it would turn the trick, and so sleuthing began. Eventually, in an eastern school of agriculture, a suggestion was found that led to these developments, and now it is predicted that pneumonia mortalities are due for a decided tumble. This is a fine example of deductive and inductive reasoning. It has been known before that the pneumococci were soluble in bile and that the types changed back and forth, dependent, according to some observers, upon the carbohydrate radical. We hope that this new enzyme will stand up in every practical test so that we may add hosanna to this eureka!

A. E. H.

MEDICAL MEETINGS

This might be called, very fittingly, the season for medical meetings in this part of the country. The Iowa State Medical Society has just held its annual meeting, May 4th to 6th, at which time a most interesting and instructive program was presented. Three other states, Minnesota at St. Paul, May 23rd to 25th, North Dakota at Grand Forks, June 1st and 2nd, and South Dakota at Watertown, June 20th to 22nd, will be holding their annual state meetings at early dates.

Minnesota, whose program is practically completed, will offer an unusually attractive program this year which is both instructive and interesting. It is varied and so arranged it will keep one busy to get to all the things he may wish to see and hear. The Dakota meetings will no doubt be on a par with the excellent meetings they have had in the past. Physicians who attend any of these meetings will be well repaid for the time taken and for the cost it will entail. They should not only attend the meeting of their own state but, if possible, one in a neighboring state.

The programs are good and much can be learned of a scientific nature which will make one a better physician. While this alone would make it worth while it is not all one gets when he attends meetings of this nature. One comes in contact with his fellow physicians who have the same problems he has and by meeting and discussing them obtains much of value. Some may be a little blue at the present time on account of depressed conditions and feel that his lot is rather hard. After he has talked with others who have found conditions likewise bad (and he will find them) he will return home feeling better and look forward hopefully and cheerfully to the time when these will improve.

The chance to get away from the grind of practice for a few days, get into different surroundings, mingle with others, and talk over puzzling problems will be well worth while. It is

something of which every physician should avail himself more frequently than he does. One may feel that it is impossible to get away from his work, but unless he does so rather frequently, he will not be able to keep up with the rapid advancement continually being made in medicine, and when this is the case both the patient and the physician suffer. Endeavor to attend these meetings if possible. To do so one will not only be benefited personally, but will also lend encouragement to those who prepared the programs, papers and discussions. He will return to his work prepared to render better service to his patients and the profession he represents.

S. A. S.

### HOBBIES

"A hobby is a favorite subject of discourse, thought or effort."

During the earlier part of a physician's life the professional studies are so interesting that while he has the strength of youth he often works fifteen or eighteen hours a day, forgetting everything but the one theme. This however, cannot continue indefinitely. The curse of routine work is that it makes one old and the blessing of a hobby is that it keeps one young and it prevents narrow-mindedness.

When we consider that the life of a physician is one of constant study and fight against those things which destroy life, it is not surprising that over-application to this work should be more conducive to depression than work in other fields.

There should be in every life two hobbies; one which exercises the physical as golf, tennis, horse-back riding and curling, the perusal of which tends to keep the physical side fit. Somewhat later in life one should add a hobby which does not require physical exercise so it may become useful if one lives beyond the time when physical exercise can be indulged in.

These hobbies are numerous. Painting, writing, study of bird and plant life and the collection of things are only a few samples.

A large percentage of men who have lived beyond the ordinary term of life have been noted for hobbies. Again, most hobbies lead one into a circle of congenial friends and nothing is more conducive to happiness in any stage of life than congenial friends.

It is a deplorable condition to find oneself unable to continue one's daily work and nothing to take its place. If one has a hobby this never occurs.

Now, a hobby is not acquired at command; therefore, it must be cultivated along through life before it is absolutely demanded to replace other activities.

Frequently one meets people who complain they have nothing to do. They are always unhappy and will remain so until they find something interesting to do.

The lack of hobbies keeps one working long after the economic reasons for a daily occupation is past. Hobbies may or may not be of value intrinsically.

Hobbies may be divided into the following groups: the acquiring of things; the creation of things; and the acquiring of knowledge. It is not the amount of money spent that makes a hobby beneficial but the spirit which goes into it. The creation of things lead one to suggest the work shop which is a very inexpensive way of lending charm to one's fancy. This hobby often demands a good deal of manual labor which is beneficial.

Work; also annex and cultivate carefully a couple of hobbies.

C. D'A. W.

### FEE COLLECTION IN ACCIDENT CASES

We frequently hear of accident cases where large settlements were obtained but the attending physician received nothing for his services. Many of these are automobile mishaps that occur away from home where the parties are not known, and where evasion, or tricky shifting of responsibility by the individual or insurance company, is more easily practiced, upon an unsuspecting attendant.

Our hearts are full of sympathy for those who have misfortunes, but when a judgment is obtained, largely based upon the size of the doctor bill that must be paid, there should be some legal provision making escape from such obligation, more difficult.

The Montana legislature passed a bill, giving physicians who care for or treat persons injured in accidents, liens on any judgments, settlements or insurance, obtained by the injured persons by reason of such injuries. We believe this is eminently fair, and a move in the right direction.

Who can suggest what's to be done with the many birds of passage who receive first aid and then stealthily wing their way without the formality of making leave-taking settlements?

A. E. H.

## Proceedings of the Minneapolis Clinical Club

Meeting of February 11, 1932

**T**HE regular monthly meeting of the Minneapolis Clinical Club was held in the Lounge of the Medical Arts Building on Thursday evening, February 11, 1932. After dinner, the meeting was called to order by the President, Dr. F. F. K. Schaaf, at 7:00 P. M.

After a short business meeting, during which officers were elected for the year 1932-1933, the following scientific program was given.

Dr. Stanley R. Maxeiner reported a case of "Cirrhosis of the Liver with Extensive Ascites Successfully Treated by the Talma-Morrison Operation." (Exhibition of the Patient.)

*History*—J. S., age 42; male; white; married; occupation, barber. Family history is negative. The use of drugs is denied; he admits using alcoholics excessively and smokes cigarettes heavily. There is no surgical history but patient admits having had gonorrhoea some years ago and denies lues. None of the usual childhood diseases were experienced nor any illness or injury prior to the following history:

In May, 1931, both ankles became swollen, lasting about two weeks. (Patient states he bought arch supports which fixed up his feet and swelling disappeared because of them.) There was no recurrence of edema in the feet or ankles until three weeks prior to hospitalization on August 21, 1931, when he developed pain in the lower abdomen and edema which started in the feet and advanced to the ankles and legs up to the knees, followed by edema in the abdomen. A few days later an acute pain in the mid-back was felt and since then he has been conscious of a sense of stiffness, though pain has diminished.

*Present Complaint*—Crampy pains in the lower abdomen which radiate up into the back on both sides; edematous feet, ankles, legs up to the knees, and abdomen. These symptoms have been present for approximately three weeks. There has been no vomiting and appetite has always been good. Symptoms are not influenced by intake of food of any kind. Shortness of breath is also complained of. Very careful check-up, however, reveals that the patient has had a gradually increasing abdominal girth for at least two or three years, that he has increased in weight approximately fifty pounds with this increase in girth, but this history of such gradual onset, in

the mind of the patient, is associated only with increase in weight.

*Physical Examination*—Temperature 99.4° at 11:00 A. M.; pulse 120. General appearance: Well built and developed, overnourished, overweight with obese and ascitic abdomen. Height, 68½" barefooted. Weight, 253 pounds stripped; maximum in last year, 253 with clothes; minimum 250; best average weight, 205.

Skin: Negative.

Eyes: Pupils react to light but appear slightly slowed. Vessels: There are two veins, right angle crossings with compression. This may be due to arteriosclerosis; however, there are not sufficient findings to warrant diagnosis.

Ears: Negative.

Nose: Negative.

Throat: Tonsils are enlarged and dusky red in color. Crypts contain infection.

Dental Examination: Seven teeth missing; a number of the remaining teeth show foci of infection.

Thyroid: Negative.

Chest: Normal contour; obese appearance.

Lungs: Negative.

Heart Examination: Inspection negative. Palpation: No thrills. Auscultation: Tones normal at apex and base. Pulse: Rate 90; rhythm regular. Blood pressure: Systolic 140; diastolic 90. Pulse pressure: 50. Arteries normal. Electrocardiograph study: Diagnosis: Tachycardia, deep Q wave in DIII.

Abdomen: Enormously enlarged because of fluid and adipose tissue. The veins on the upper part are quite prominent. Inguinal rings are competent. The liver cannot be definitely outlined because of the amount of fluid in abdomen.

Genitalia: Normal.

Rectal Examination: No hemorrhoids present. The anus shows no enlarged veins and no fissures.

*Orthopaedic Examination*—Negative.

### LABORATORY FINDINGS

Blood Count: Total erythrocyte count: 5,000,000. Total leukocyte count: 18,800. Polymorphonuclears: 85. Small mononuclears: 11. Transitionals: 1. Eosinophiles: 3. Polymorphonuclears all show many toxic granules. Hemoglobin: 90%. Coagulation time: 6 minutes.

Blood Wassermann: Negative.

Blood Chemistry: Nonprotein nitrogen: 30.0.  
Urea Nitrogen: 12.0. Creatinin: 1.5. Sugar: 75.

Liver Function Test: Icterus Index: 18.0.  
Vanden Bergh—direct—trace. Indirect—3 milligrams.

Urine, single: (Microscopic). Acid reaction:  
Specific gravity, 1012. Albumin and sugar: 0.  
Mucus: Few threads. WBC: Rare cells. RBC  
and casts: 0. Epithelia: Occasional squamous  
cells.

#### X-RAY FINDINGS

Six-foot Plate of Heart: Aortic measurement:  
7.0 centimeters. Measurement of the right heart:  
4.0 centimeters. Measurement of left heart: 13.0  
centimeters. Transverse measurement of the  
entire heart: 17.0 centimeters. Transverse meas-  
urement of chest: 32.0 centimeters. Relative  
ratio of the heart in chest capacity: 53%.

Lumbar Spine: Films unsatisfactory on ac-  
count of enormous abdomen. However, the lat-  
eral view is fair and shows no evidence of pa-  
thology. In fact, the lateral is quite dependable  
for diagnostic purposes. It would probably be  
impossible to get a satisfactory anteroposterior  
view of the patient's lumbar vertebrae.

#### GENERAL DIAGNOSIS

1. Cirrhosis of Liver.
2. Back strain, probable (secondary to lordotic  
position due to abdominal distention).
3. Weak Feet, first degree.
4. Dental caries and one abscessed tooth.

After admittance to the hospital, the patient  
was aspirated on the average of eight to eleven  
thousand c.c. every seven to nine days. In Sep-  
tember, 1931, with a preoperative diagnosis,  
cirrhosis of the liver, modified Talma-Morrison  
under local anesthesia included scarification of  
the liver and diaphragm, and omentopexy.

*Operation*—The abdomen was opened under  
local anesthesia through midline incision which  
turned to the right of the navel because of pre-  
vious abdominal punctures. The liver was very  
much enlarged; free fluid had largely escaped;  
liver was grayish-white and extremely firm with  
rounded edge. A portion of the liver was re-  
moved for microscopic diagnosis. On the sur-  
face of the liver were enlarged veins and sever-  
al hemangiomas. The spleen was likewise  
enlarged. The surface of the liver was scraped  
with gauze as far up as we could possibly  
reach; the diaphragm was scraped and scratched  
with a scalpel, and where possible, the liver was  
also scraped and scarified. An attempt was made

to scrape the surface of the spleen with a piece  
of gauze. The omentum was then anchored to  
the abdominal wall with interrupted linen sutures  
extending from the left kidney pouch clear across  
to the right kidney pouch. At the level of the  
liver the rectus muscle was displaced from its  
posterior sheath and a hole made in the posterior  
sheath through which a strip of omentum, prob-  
ably four or five inches long containing a very  
large dilated blood vessel group, was drawn and  
this was lodged between the muscle and the pos-  
terior sheath in such a manner as to promote anas-  
tomosis between it and the epigastric vessels.  
The abdomen was then closed with interrupted  
Finny sutures, being first reinforced with dermal  
and final running sutures to approximate the  
anterior sheath very carefully. The incision was  
closed without drainage, dermal in the skin.

The patient left the operating room in very  
excellent condition, stating that he did not know  
that he had been operated on, having had mor-  
phine and scopolamin preliminary.

*Microscopic Examination of the Piece of Liver  
Removed*—The section measuring 1x1 centimeter  
reveals an increase of fibrous tissue in the por-  
tal canal and also a fine fibrosis extending through  
the nodule to the central vein. The liver cores  
are tortorous and somewhat compressed. The  
individual cells show an increased content of fat  
droplets and beginning hydropic degeneration.  
There is rather marked exudative inflammation  
throughout the liver section. The portal canals  
are infiltrated by large foci of polymorphonu-  
clear neutrophilic leukocytes, lymphangites and  
plasma cells. Eosinophiles are scattered diffusely  
through the nodules in the connected tissue and  
spaces between the liver cells.

#### DIAGNOSIS

1. Portal Cirrhosis.
2. Acute Hepatitis.

This patient is particularly interesting from  
the following point. He has undoubtedly had  
a cirrhosis of the liver for the past two years  
with gradually increasing weight and a greatly  
increased abdominal girth. The acute abdominal  
pain of three weeks ago was undoubtedly asso-  
ciated with the acute hepatitis as shown in the  
specimen removed from him. Following the  
operation, the patient was at first tapped weekly  
of amounts varying from 5,000 to 7,000 c.c. The  
amount of each tapping gradually decreased and  
the interval between tapping was increased until  
at the present time the patient has very little  
free fluid. The circumference of the abdomen

has decreased about 15" and he has not been tapped for about two months.

## DISCUSSION

DR. F. H. K. SCHAAF: Were there any liver function tests on this case?

DR. STANLEY R. MAXEINER: Liver function tests were: Icterus index: 18:0; Vanden Bergh—direct—trace. Indirect—3 milligrams.

DR. ARCHIE H. BEARD: How low was his blood sugar?

DR. MAXEINER: His blood sugar was 75. The immediate mortality of these operations as reported by Moynihan is approximately 20 per cent and the postoperative mortality is also about 20 per cent, the postoperative mortality undoubtedly being due to the fact that these people do not furnish a very good surgical risk and in many instances are not able to survive long enough to obtain the effect of a collateral circulation.

DR. O. J. CAMPBELL: I should like to ask Dr. Maxeiner how large the spleen was in his case and whether or not he considered doing a splenectomy. We had a case at the University Hospital three or four years ago in which we combined splenectomy with the Talma operation. Two years later he was known to be perfectly well. I wondered whether Dr. Maxeiner considered doing this or whether he did not advise such a procedure for fear of adding to the risk.

DR. MAXEINER: In reply to Dr. Campbell, I considered splenectomy at the time of the operation. The spleen was probably twice its normal size and quite firm. Of course, in doing a splenectomy, one automatically does a Talma-Morrison, according to Moynihan. This is undoubtedly the result of adhesions between the omentum and the splenic bed, and the omentum and the abdominal wall.

DR. CAMPBELL: It all depends on whether there are adhesions to begin with. This case had practically no adhesions so that splenectomy was easily accomplished. What we wished to do was to take the load off of the portal circulation by ligating the splenic artery.

DR. MAXEINER: My personal experience has been limited to the Talma-Morrison operation and I felt it better to stick to the method with which I was more familiar. There are probably eight or ten different procedures done for surgical relief of this condition such as ligating the veins of the portal system, as example, an inferior mesenteric vein and the superior hemorrhoidal, splenectomy, splenectomy with omentopexy, the formation of an Eck's fistula, etc.

DR. F. H. K. SCHAAF: There are so many things we simply cannot explain at the present time. I saw a case a very short time ago where the patient presented a characteristic picture of cirrhosis of the liver. We did the liver function tests and he showed a retention of 45 per cent of the dye in an hour. After a little while he improved somewhat and during this time he went to Rochester where they told him he didn't have any cirrhosis, but an ascites of unknown origin. He came back and within four weeks developed again fluid in the abdomen. After giving Novaserol he got rid of it com-

pletely, improved very steadily and is doing very nicely today.

DR. JAMES HAYES: I want to congratulate Dr. Maxeiner on this nice piece of work.

The case just mentioned by Dr. Schaaf reminds me of a somewhat similar case I had.

He had been treated a week or two before for "flu." He then came into the hospital with a marked ascites. He was so distended that it interfered with his respiration. We couldn't palpate anything in the abdomen until aspirating the fluid, then a mass in the area of the transverse colon or stomach could be palpated, which appeared malignant. X-ray by Dr. Ude showed no pathology in the colon or stomach, but he did make a diagnosis of extra gastric pressure. The liver was large and extended below the costal margin one and one-half or two inches. The patient was losing weight and strength rapidly and gave all symptoms of a rapidly developing malignancy. We thought the mass we felt was a metastatic carcinoma of the omentum. He remained in the hospital about one month during which time he was aspirated once or twice a week, to relieve distress. After one month he went home. He was still bed-ridden and apparently losing ground. I went to the house to aspirate whenever his distress became unbearable.

One day while the aspirating needle was inserted in the abdomen he suddenly lunged forward and drove the needle into the intestine. Intestinal contents drained out through the needle and continued to drain for some time after the needle was withdrawn. He developed a peritonitis which we thought would result fatally. To our surprise the peritonitis cleared up, no more fluid accumulated in the peritoneal cavity and the patient gradually improved.

It was about one year ago this condition first appeared. He was in the office last week. He appeared to be well. No masses could be palpated in the abdomen, nor could any other pathology be made out. What the original condition was I am not certain, but apparently the development of a peritonitis stopped the accumulation of fluid in the peritoneal cavity.

DR. SCHAAF: That of course would be pretty difficult to say. Ordinarily with a hepatitis they certainly do not develop that degree of ascites. Seems to be a more chronic type you are dealing with.

DR. J. S. MCCARTNEY: Some three to five years ago someone reported before this Club a patient whom he had tapped some 200 times and had removed several hundred liters of fluid. I think that such a case is exceptional, and that Dr. Maxeiner's also is exceptional. As far as I can gather from reading the literature on cirrhosis, ordinarily when a patient gets ascites his days are numbered. There are patients, however, who cease to have fluid accumulate in the cavity following tapping, and some apparently spontaneously. For no good reason they seem to pass out of, temporarily at least, the ascitic stage. Some of them have been in good health for a number of years between tapings. Why they are free from ascites for long periods of time is absolutely unknown. I think there is some experimental evi-

dence to show that by changing diet in cirrhotic animals ascites can be produced more or less at will and also caused to disappear. Of course the cirrhotic process is a thing that is ordinarily of very slow evolution. It probably takes a good many years to reach the stage at which it produces symptoms. There are tremendous variations in the livers of patients who have cirrhosis, and some have big livers with extreme symptoms; many have minor degrees of fibrosis and destruction of liver parenchyma, and at other times there is a very high grade cirrhotic process with a very small liver and yet so far as can be determined there are no symptoms, no ascites, jaundice, gastro-intestinal disturbances or anything of that sort. Why some of these patients have no clinical signs of disease is again unknown, because if one compares them from the standpoint of the degree of involvement of the liver one would think that all of these more advanced ones should have symptoms. It is perfectly true that you only occasionally find a patient who has an extreme cirrhosis and who does not have symptoms, but they are not so infrequent that you can disregard them. The microscopic description that Dr. Maxeiner read in this particular case is a composite view of the change that you see in the series of cirrhoses. There are apparently more polynuclear cells in this particular liver than are usually seen. You generally always find some. Usually you have leukocytes, mononuclears and a few eosinophiles, and only occasionally polynuclears. In the cases we have on record in the Department—there are somewhere in the neighborhood of 300—some of them have started very suddenly to have their symptoms. The first symptom may be hemorrhage, or the first symptom may have been a sudden onset of accumulation of fluid, or by the development of edema of the extremities. What you attempt to do in the Talma-Morrison is help nature with her treatment, when there isn't adequate collateral circulation. Did this particular patient have abdominal varices visible from the outside?

DR. MAXEINER: No, not particularly.

DR. McCARTNEY: Drs. Webb and Wynne had a case recently of the splenic anemia type where there were no varices on the external surface, and clinically no evidence of fluid. As they went into the abdominal cavity they found varicose veins as large as a finger, or perhaps larger.

DR. R. C. WEBB: The case which Dr. McCartney mentioned was one in which we removed a very large spleen for splenic anemia in an eleven year old boy. When the abdomen was opened the liver was obviously very much diseased and presented a very irregular surface with a very large amount of scar tissue. After removing the spleen the omentum was fastened between the rectus muscle and its sheath as advised by Talma with the hope that we might prolong his life with this additional procedure although we felt that the condition of this liver would more than likely cause his death before many months. The boy got along very nicely, his abdomen being soft and bowels moving, and from a surgical standpoint he was doing very well when at the end of three and one-half days he began to have

bloody stools and died after a few hours and the autopsy showed dark blood in the colon and bright blood in the stomach indicating hemorrhage into the stomach and Dr. McCartney was able to demonstrate oesophageal varices.

I think that Dr. Maxeiner should be congratulated on the good result which he obtained in his patient and his result should give us courage to perform this operation more often. He has undoubtedly prolonged his patient's life and increased his comfort and he may have tided him over an acute exacerbation which may now greatly prolong his life. It would be very interesting to have him present his case at some time in the future, as I am sure that the members of the society would be interested in the future progress of this very interesting case.

DR. MAXEINER: Mann of Rochester, in his experimental work, has shown that if 70 per cent of the liver is removed from a dog, regeneration takes place so quickly that in twelve weeks the liver is reformed. Regeneration of the liver cells, according to Moynihan, is hindered in the conditions of cirrhosis and he believes that by deflecting some of the portal blood into other channels, relief is given to the liver and the liver cells will proliferate and regenerate. Undoubtedly regeneration must take place inasmuch as there are numerous reported cases in the literature who have lived comfortably from twelve to fifteen years without recurrence following this operation. In this instance, the patient has been changed from a veritably bed-ridden invalid to a man who is now able to return to his regular occupation as a barber.

Dr. James Kerr Anderson read a dissertation entitled "Anal Anatomy with Particular Reference to the Ano-Rectal Junction," which will appear in a later issue of the Journal Lancet.

Dr. Edward Dyer Anderson and Dr. John F. Pohl (By Invitation) presented case reports on "Prenatal Pulmonary Infection," with lantern slides.

#### DISCUSSION

DR. EDWARD DYER ANDERSON: I am going to ask Dr. Dornblaser to tell us if there was anything significant in the history of the mother and the labor, and Dr. Rea something about the pathology.

DR. H. BRIGHT DORNBLASER: This woman went through a very normal pregnancy. Her physical examination was negative. She had no signs of any infection anywhere and when she came to labor, the labor was perfectly normal. It was not unduly long, and not a rapid one. It was spontaneous. When the baby was born there was no sign of any trouble, and to all appearances was a normal child. It wasn't until about twelve hours later that it began to show any sign of trouble, and then I looked for help. There was nothing of any significance in the pregnancy or the labor.

DR. REA: This case is particularly interesting because of the rarity of the condition. The body was that of a well nourished, normally developed white female infant,

measuring 45 cm. crown-heel and weighing about 4,000 grams. The chief thing of interest in the autopsy was the condition of the lungs.

The right lung weighed 25 grams, the left 12.5 grams. The right lung felt solid throughout, more marked in the two upper lobes. Throughout the posterior portions of both lungs there was definite lumpy sensation. The surface of the pleura appeared normal. Both lungs cut with increased resistance and the cut surface varied from a dull red color, seen especially in the right lung, to deep red hemorrhagic areas, noted especially in the lower and posterior portions of both lungs. There were multiple small abscesses throughout both lungs, varying from pinhead size to 3 mm. in diameter. Pressure on the cut surface of both lungs expressed a thin greenish yellow pus from the abscess areas. The right upper and middle lobes had a firm, fibrous texture. Both lungs floated in water.

The microscopic picture shows evidence of an "acute" interstitial pneumonia with a marked increase of connective tissue, giving a solid appearance in many areas; within this connective tissue infiltration the pulmonary alveoli are compressed; there is marked thickening of the alveolar septa with the extensive polymorphonuclear invasion; there are multiple areas of focal necrosis; bronchi and bronchioles show many desquamated epithelial cells in their lumens; in the portion of lung not compressed by connective tissue the alveoli are filled with exudate, red blood cells, and polymorphonuclear cells; in some areas there is definite atelectasis surrounded by lymphocytic infiltration; the blood vessels are engorged.

The liver and spleen were normal and no treponema could be found in these organs or in the lungs.

The diagnoses were acute interstitial pneumonia, pulmonary atelectasis, multiple abscesses of both lungs, and bronchopneumonia.

DR. E. S. PLATAU: Although abnormalities in the pulmonary tissue and pleurae are not common in the newborn, yet we see them occasionally and in a surprising variety. I have just recently seen a case of pneumonia in the newborn in which there was an apparently more or less chronic empyema with a thick abscess wall. There were several small pulmonary abscesses on the same side and pneumonic atelectasis in the lower lobe of the opposite side. Fluid from this empyema cavity was seropurulent and contained many pneumococci. In another case there was a low grade upper respiratory infection with a shifting mucous plug, causing typical X-ray pictures of foreign body, first in the lower portion of the right lung and after tracheal aspiration in the left upper lobe. The microscopic sections in this case showed very poorly developed elastic tissue in the bronchi.

Fibrosis occurring in non-luetic newborns is much less frequent, although some cases have been reported. They have been termed bronchitis obliterans, desquamative pneumonia obliterans and interstitial pneumonia. Lange reported a case which lived for five months with widespread fibrosis throughout both lungs, and Klop-

stock reported a girl who died at the age of ten with a similar condition. It has been suggested that the proliferative changes begin in the stroma of the bronchial walls arising from the stimulus of an infective agent which is most likely blood borne. The interesting thing in these cases, it seems to me, is the widespread proliferative changes that can occur with very few evidences of inflammatory reaction.

DR. DORNBLASER: A few years ago I presented before this Club a case of a child delivered after a long labor in which the membranes had ruptured prematurely. This woman was in labor for ten or twelve hours after the membranes had ruptured. At autopsy the child showed a full-blown bronchopneumonia. The child was born about three in the afternoon and died about six. We felt that this must have been an antenatal infection in this case, although probably it could have occurred through the rupture of the membranes, the infection going up in the amniotic fluid.

DR. ARCHIE BEARD: There has been some work done recently on the relationship of atelectasis to bronchiectasis. This case reported tonight may be the early stages of the same condition. It has been shown that a great number of cases of bronchiectasis are due to the bacillus mucosus-capsulatus. Skin tests will show a definite allergic reaction to this organism. The pathological picture as presented in this child would probably have gone over to an atelectasis if this child had lived many months. It would have been of interest to have known what organism was the cause of pneumonia found in this case. Pneumococcus will very likely not give us such a picture. It is probably some organism as bacillus mucosus-capsulatus that is responsible for all three stages, namely pneumonia in utero, followed by atelectasis in early life, and bronchiectasis in the adult.

DR. McCARTNEY: I wonder if the patient Dr. Dornblaser just referred to was the one I was thinking of, eight or nine years ago before we were doing as many baby posts as we have been in recent years. I think as I recall it we had a hard time convincing him and ourselves that we had a pneumonia. I may have seen these sections, but just from looking at these lantern slides I wonder why this is called an interstitial pneumonia. It appears from the lantern slides very similar to the process we see in the adult with organized pneumonia, with extensive fibrosis and with or without abscess pockets, and I am wondering if it is actually an interstitial pneumonia or simply a pneumonia of long standing which has undergone organization.

DR. REA: One can see in the microscopic sections better than in the lantern projection of them that the process is distinctly interstitial and is not a diffuse carnification as seen in unresolved pneumonia. As to etiology, there is an acute interstitial peribronchial pneumonia following measles and influenza in older children, in which MacCallum has found hemolytic streptococcus. A number of organisms may cause this same condition, however.

H. BRIGHT DORNBLASER, M.D., Secretary.

## Proceedings of the Minnesota Academy of Medicine

Meeting of February 10, 1932

**T**HE regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, February 10, 1932. Dinner was served at 7 o'clock and the meeting was called to order at 8:15 by the President, Dr. J. C. Litzenberg. There were 55 members present.

Minutes of the January meeting were read by Dr. C. B. Drake, in the absence of the secretary.

The President then called on Dr. William Davis, of St. Paul, to read the minutes of the first meeting of the Academy which was held on October 13, 1887, with Dr. Edward C. Spencer as secretary. Dr. Davis presented the original copy of these minutes to the Academy and a motion was carried that they be placed in the permanent records of the Academy with this meeting of February 10th.

The President announced the death of Dr. John Fulton, one of the oldest and best loved members of the Academy, and appointed a committee consisting of Dr. John Brown, Chairman, and Drs. S. M. White and J. S. Gilfillan, to draft resolutions on Dr. Fulton's death.

The following scientific program was given:

DR. KENNETH BULKLEY (Minneapolis) read his inaugural Thesis entitled "The Role of Oxyuris and Trichocephalus in the Etiology of Appendicitis." This was illustrated with numerous lantern slides showing serial sections of appendices. (Published later in Minn. Med.)

### DISCUSSION

DR. W. R. RAMSEY (St. Paul) : During the war I was in France for a year and a half with Dr. Park and our work was among the child refugees. Dr. Park came to the conclusion that these parasites were normal, at least in French children during the war; he found practically none of the children of that class that did not have pin worms. The very fact that it is so difficult to rid these children of these worms suggests in all probability that the appendix is involved and this may explain the recurrences of the worms. You think you have gotten rid of them and then so frequently they later recur. This may be the explanation.

DR. A. SCHWYZER (St. Paul) : I think nearly all of us are a little stunned to see that the oxyuris on close examination should be so frequently found. I recall one little girl of 7 years. On opening her appendix, these oxyuris were so thick that they looked just like fur on the inside of the appendix. Still, the percentage in Dr. Bulkley's cases seems to me to be rather large. From

now on we shall examine the removed appendices still more carefully than before. We always examine the appendix and make sections; but, of course, to make serial sections of the whole appendix is to ask too much of the laboratory man. It may be that we have not encountered oxyuris more often because we were not impressed with the necessity of looking very exactly for even young ones. *Trichocephalus dispar* I have not seen. I should not have said anything on this subject but for one thing which I recently read in the *Zentralblatt für Chirurgie*, where it was urged to section the appendices longitudinally. The appendix is rolled up tightly and is then sectioned longitudinally. In this way the microscopic examination is greatly simplified and overlooking areas of localized trouble is much more easily avoided.

DR. A. E. BENJAMIN (Minneapolis) : I want to mention a case similar to the corollary by Dr. Bulkley in his paper. I recall one patient about eight years ago who had worms and who had had various treatments, but with no results. Her appendix was always tender and I thought perhaps a good way to get rid of the worms was to take out the appendix. She has had no further trouble since the operation. We found numerous worms in the appendix. I believe this is of more common occurrence than we think; the trouble is not cured by the usual treatment because the worms are in the appendix.

DR. J. C. LITZENBERG (Minneapolis) : It would not have been necessary to go back to the *Zentralblatt* for that method, for in the *American Journal of Obstetrics and Gynecology*; June, 1920, that method was given in the making of sections of the whole Fallopian tube, which is comparable to the appendix.

I had a very unusual case where there was tuberculosis of the uterus, vagina and tubes. I coiled them all up together and found the lesions in the coiled specimen clear from the vulva to the end of the tube. It is a good method.

DR. A. E. WILCOX (Minneapolis) reported the following case of Extraperitoneal Cyst:

The patient, Mrs. C. M., age 39, was admitted to Eitel Hospital at 2 A. M. August 20, 1931. The present illness commenced on August 16, 1931, with uterine bleeding at first slight in amount. The following day the bleeding ceased, and then continued irregularly, being bright red and, at times, dark clots only. The patient felt weak, with pain low in the back on both sides. The day of admission she experienced quite severe pain in the left lower quadrant of the abdomen. The pain was intermittent and was referred down the inside of the left thigh.

She had been operated for ectopic pregnancy.

right side, in 1927. Her last menstrual period was May 25, 1931.

Examination showed a well-nourished woman of about the age given, complaining of severe pain on the left side. Pelvic examination showed marked tenderness and resistance in the left side, but no definite outline of any tumor could be made out, and mobility of the uterus was questionable on account of the pain. The cervix was negative.

Diagnosis was acute abdomen—(1) ectopic pregnancy; (2) ovarian cyst, possible torsion of pedicle.

Operation: On August 20, 1931, at 10:50 A. M., under spinal anesthesia (200 mgm.  $N_2O$ ) a midline incision was made. There was no free fluid in the abdomen, but there were dense adhesions of the large and small bowel to the right cornu of the uterus and right broad ligament. A cyst about the size of a large lemon was found on the left side with its pedicle and the left tube twisted. This was located deep in the pelvis. A cyst about the same size was found on the right side. Adhesions of the large bowel were relieved and the serous covering of the bowel stitched with dulox sutures. Both cysts were removed without disturbing the other appendages. The right side had been operated (previous history). The wound was closed with plain for the peritoneum, chromic for the fascia, single layer reinforced with three or four interrupted sutures. Silkworm was used for the skin. The postoperative period was quite uncomfortable for four or five days, more so than usual, the patient having considerable distention, nausea, and repeated emesis; but from the fifth day post-operative until discharged her record shows nothing unusual and her temperature was normal. She was discharged September 1, 1931, apparently well.

On September 8, 1931, she reported that since leaving the hospital backache and insomnia had been marked and recently she had pain in the left lower quadrant. In reviewing the case, I found she had complained some of pain in this area while in the hospital.

Examination showed the abdominal wound healed. On palpation a feeling of resistance was noted low in the left lower quadrant, and on vaginal examination not only a resistance to the left, but a palpable mass occupying a position to the left and downward from the uterus, which was smooth, slightly movable, and in size comparable to a four-months pregnant uterus. There had been no menstrual bleeding, but she reported

some vaginal discharge. After the patient had urinated, the vaginal examination was repeated and the same findings were present, namely, a mass in the position of the uterus extending to the left and downward. Other examinations were negative.

On October 26, 1931, she reported that she had had one normal menstrual period. The same physical findings were present in regard to the mass. The leucocyte count was 12,000. No definite diagnosis was made, and exploratory operation advised. A scout X-ray film of the pelvis and mass was made, with negative deductions.

In November 6, 1931, under spinal anesthesia, a midline incision was made, dissecting out the previous operative scar. Upon opening the peritoneum above the mass, the omentum was found adherent to the parietal peritoneum. There was no free fluid in the abdomen. The left ovary appeared normal (evidently the cyst removed at the previous operation was of para-ovarian origin). The tube on the left side was distended with fluid (hydrosalpinx). This tube was removed. After a few adhesions to the surrounding structures were separated, the uterus could be brought up and inspected and it appeared to be normal although there were some adhesions on the right side.

The bladder was pushed over to the right side and backward, and the mass which had been felt previous to operation proved to be extraperitoneal and occupied a position to the left side of the bladder, in front of the uterus, and reached down to the symphysis pubis. The peritoneum was then closed above the mass, the abdominal muscles separated from the peritoneum, and the upper part of the mass came into view which was somewhat regular, giving an impression of fluctuation. A line of cleavage was found and enucleation started. On the outer and anterior and also on the mesial side of this mass enucleation was more difficult as the adhesions were more dense. At one time the question of this mass being an obstructing diverticulum of the bladder was considered, but, inasmuch as it was extraperitoneal, this theory was discarded. A moderate sized needle was used to aspirate the mass and hemorrhagic fluid was obtained (a small amount for culture). Enucleation was then continued and eventually the mass was removed. It was about the size of a normal kidney and much the same shape. A small rupture occurred on its outer side during the process of enucleation, but this was clamped, no serious hemorrhage was en-

countered, and no definite connection of this mass to the other structures was found, it being enucleated en masse. The peritoneum was then closed with plain and a penrose tube placed into the extraperitoneal bed from which the mass had been enucleated. The wound was closed with tier sutures, silkworm stay sutures, and clips for the skin. The postoperative recovery was progressive. The patient left the hospital November 19, 1931, and has remained well since.

Pathological report on specimen: Several sections were made of the wall and all show a rather uniform structure. The outer portion is composed of rather dense connective tissue with diffuse and focal infiltration of lymphocytes, plasma cells and an occasional neutrophile. The inner lining is covered with a membrane composed of red blood cells in various stages of disintegration. Just beneath this there is a band of cells showing marked phagocytosis of hemosiderin. No evidence of malignancy is seen. There are no structures resembling endometrial glands present. The sections have the appearance of a fibrous reaction to an escape of free blood into the tissues. Diagnosis: encysted hematoma. (Wm. A. O'Brien, Pathologist.)

#### DISCUSSION

DR. J. L. ROTHROCK (St. Paul): It was my privilege to operate on a retroperitoneal cyst a little more than a year ago. These tumors of various kinds are not at all uncommon. In my case the tumor lay behind the cecum. At first I thought it might be a renal tumor but after further investigation we decided it probably was not. I thought of hypernephroma but it did not extend up as far as the kidney. I then thought it might be a cyst of the ovary with adhesions.

At operation we found this tumor was intraperitoneal, and lay behind the cecum. I divided the peritoneum over the cyst and then, to my surprise and satisfaction, it was the simplest thing in the world to enucleate it. It was attached by no blood vessels and had no pedicle. There was very little bleeding except where we divided the peritoneum over the cyst. It measured 15cm. and 12 by 9 cm., or a flattened oval in shape. It seemed to have a fluid which was dark in color and which was described as greyish brown. When it was opened, we found there were low papillary growths 1 cm. in diameter in one area of the cyst wall. The cyst wall was rather thin and showed nothing in particular. On microscopic examination this was found to be adenocarcinoma. This woman was 31 years old and the only symptom of which she complained was this tumor. A year after the operation there was no recurrence. I have not recently heard about her, but have written to inquire how she is.

One thing which makes me think the prognosis may not be so bad was that at no place had these papillary growths penetrated through the capsule. There were

not many lymphatics leading from it. The chances for permanent cure were perhaps not so bad in that case.

DR. A. E. BENJAMIN reported a case in connection with the paper on "Nasal Suction Treatment of Postoperative Vomiting, Pain and Dehydration." (Paper to be published in Minnesota Medicine soon.)

This patient is a young single man 22 years of age, five feet six and one-fourth inches tall, weight 138 pound, and is employed as an electrician. His health has been fairly good in the past with the exception of having had children's diseases; infection of the left hand and wrist in 1927, which required lancing and drainage; pneumonia in 1928; and in November, 1931, he had another slight infection of the left wrist. He has had a few attacks of tonsillitis. His general habits are good. He smokes about half a package of cigarettes a day. His family history is essentially negative.

In November 15, 1931, at about 8 A. M., while out hunting, he carelessly put his No. 22 (long) cocked revolver back into the holster on his right side. The revolver went off and the bullet diagonally entered the lower right quadrant of the abdomen. He at once drove his car a mile and a half to a farm house for help. He was taken to Dr. Arey at Excelsior who gave him a hypodermic of morphin and first aid treatment, and he was then rushed to the Northwestern Hospital.

X-rays of the abdomen, taken on the day of admittance, show a somewhat diffuse haziness over the entire abdomen. There is one area of density at the level of the crest of the right ileum which simulated a metallic foreign body. Conclusions: Definite evidence of fluid in the abdomen. Determination of the presence of a metallic foreign body is not definite due to movement and slow exposure of the portable machine.

The patient seemed in fair condition, pulse 80, temperature 97.4°. Although there was a rigid abdomen, especially on the lower right, he complained of little pain or discomfort. There was dullness in the lower abdomen. Upon evacuation of the bladder, the urine contained no blood. He was not in distinct shock so an operation was determined upon and performed three hours after the accident.

Under local, gas and ether anesthesia a right rectus incision was made just inside and above the anterior superior spine. The omentum was protruding through the muscle bullet wound. The abdomen contained much blood and clots, and the contents of the bowel had escaped and mixed with

SYMPTOM CHART  
 (Dr. Benjamin's Case Report)

Date	Pain and Distress	Hypo.	Gas	Emesis	Hypodermoclysis	Kidney Function	Bowel Function	Dehydration
11 15	Abdomen	3	Belches	None	2000 cc.	Good	None	Thirsty
11 16	Abdomen Restless	5	Belches Moderate Distention	None	2000 cc.	Frequent	None	Dry
11 17	Backache and Cramps	5	Stomach and Intestine	Suction Begun	1000 cc.	Concentrated Urine	None	Thirsty
11 18	Less with Perfect Suction	4	About 900 cc.	Food Backs Into Tube	800 cc.	Fair	Slight	Less
11 19	Less Backache	3	1100 cc. Thru Tube	None	Discontinued	Normal (N)	3	Much Less
11 20	In Legs	1	950 cc.		WOUND Slight Discharge	(N)	1 Some Flatus	Less
11 21	Very Little	1	875 cc. Less Distention		Less Discharge	(N)	2 and Flatus	None
11 22	Sleepless	1	700 cc.		Slight Purulent	(N)	1 Much Flatus	None
11 23	Slight Backache	1	600 cc.		Moderate Discharge		2 Some Flatus	
11 24	None	0	Less		1 Drain Out	(N)	2 Cons. Flatus	None
11 25	Little	0	Less		Healing	(N)	1 and Flatus	
11 26	Restless	1	Some		Satisfactory	(N)	1 and Flatus	
11 27	Moderate in Back	1	Less by Tube				0	
11 28	Less	0	Suction Alternate Off 2 Hrs. On 1 Hr.				2 and Flatus	
11 29	Satisfactory	0	Suction Closed $\frac{3}{4}$ of Time				1	
11 30	None	0	Closed $\frac{1}{2}$ of Time				1	
12 1			Closed $\frac{3}{4}$ of Time				Normal	
12 2			Suction Tube Removed		All Drains Removed		Normal	

12/3 to 12/13 Convalescence perfect. Diet limited. Bowel action normal. Wound healed.

this. Saline solution with a suction was used to wash out the fecal matter from the abdominal cavity. The ileum was injured and punctured in nine places. The punctures and rents occurred in various places for about three feet along this part of the bowel. One area consisted of an injury to the mesentery for about 2 inches, causing considerable hemorrhage in the abdomen. At this point the bowel wall was not punctured. At a second area 2 inches in extent the bowel wall was ripped open on the side opposite from the mesentery and near the end of this area three small punctures existed near each other, two of them within  $\frac{3}{4}$  of an inch, about the size of a slate pencil. The bowel was punctured by the bullet in other areas about the same size. The

cecum was injured about 4 inches upward along the ascending colon but the wall was not completely severed. The rest of the intestine was examined up to about the middle of the jejunum, as well as the sigmoid, rectum, and ascending colon, but no injury was found. The iliac vessels seemed to be intact and apparently there was no bleeding from that source. The bullet was not found. It may have entered the bowel and later evacuated.

All the raw and lacerated areas were carefully stitched with Dulox, turning the raw edges in. The circulation in one area where the bowel had been greatly lacerated was somewhat impaired, but this area was stitched in such a way that the remaining portion seemed to be well supplied with

functioning blood vessels. All the areas involved were brought within a small space just below the incision, the omentum covering these areas, and four penrose drains extended into the pelvis below these injured coils. The abdomen was closed with chromic No. 1 with the muscle and peritoneum included. Four dermal stay sutures tied over a roll of gauze were put in the inner side of the incision. The skin was closed with chromic No. 0.

The patient stood the operation very well. There seemed to be very little shock. On the second day after the operation the patient's abdomen became distended and he complained of distress and pain in the back, and he had eructation of gas. A Levin catheter was then passed through the nasal cavity into the stomach and this was attached to a tube connected with an inverted suspended bottle filled with water. This bottle was connected to a bottle on the floor to permit continuous suction to remove the gas from the stomach. I have used a similar plan on cases in the past but was not able by that method to measure the gas removed or the fluids absorbed. Dr. Wangenstein, of the Surgical Department of the University Hospital, has employed a more elaborate method whereby the gas removed and the fluids absorbed can be measured. His plan I adopted in this case, with marked success as will be noted on the symptom chart herewith. (The use of this continued suction apparatus was shown on the screen, as well as other charts with symptoms and progress.)

The urine was negative upon admittance to the hospital, but on the third day there was a slight trace of albumin, indican, many mucus threads, occasional epithelial cells, and two to six pus cells. On the fifth day albumin was still present and a rare hyaline cast, with ten to fifteen pus cells. On the twenty-first day there was again a slight trace of albumin.

The day after his operation his temperature went up to 102.8°, pulse 110, and respiration 28. For the next five days the temperature fluctuated between 100° and 102°, after which time it gradually declined so that on the 10th day it was normal and remained about normal until he left the hospital. Up to the tenth day his pulse was between 85 and 100, but after that day it remained practically normal. There were no respiratory complications.

This case demonstrated the benefits derived from the continuous suction apparatus, which has the following advantages: (1) relieves pain; (2) necessitates fewer hypodermics; (3) is a distinct psychological benefit; (4) prevents

vomiting; (5) permits the patient to drink freely; (6) increases the comfort of the patient; (7) permits more rest and sleep; (8) reduces the temperature; (9) lessens intra-abdominal tension; (10) decreases the possibility of spreading peritonitis; (11) occasions earlier bowel function; and (12) hastens recovery and reduces mortality.

#### DISCUSSION

DR. ROTHROCK: Did I understand Dr. Benjamin correctly, that he did not pass the tube into the duodenum?

DR. BENJAMIN: It was put just into the stomach. I have some x-ray slides which may show that, although possibly not very clearly.

The meeting adjourned.

R. T. LA VAKE, M.D., Secretary.

## SOCIETIES

### Yankton District Medical Society

The spring meeting of the Yankton District Medical Society was held at Vermilion, April 28, 1932. This was one of the most successful meetings of the society, the Ladies' Auxiliary attending at the dinner hour.

The dinner was served by members of the Ladies' Auxiliary at Vermilion, to whom the society is greatly indebted for one of the very best dinners ever served. The society is also indebted to the ladies of Vermilion for the splendid entertainment during the dinner hour, consisting of a cello solo by Miss Albertson, daughter of the recent Doctor Albertson, and a vocal solo by Miss Ohlmacher, both high school students at Vermilion. These musical numbers were followed by a series of interpretative dancing by high school students. There were fifty-four present at the dinner, which included several visitors.

Doctor Herman G. James, President of the University, was our special guest. At the conclusion of the dinner, Doctor James delivered a short talk upon the subject of The Medical School of the University and more especially upon the problem of securing a new teacher of anatomy for the school. The new teacher comes to Vermilion this next June.

The scientific program was held in the Chemistry Building, as scheduled. The first number was "The Cause of Sudden Death," illustrated with lantern slides, by Doctor Harry L. Smith of Rochester, Minn. The doctor's conclusions on the causes of sudden deaths were well authenticated upon the post-mortem findings personally conducted by himself of several thousand cases. The next numbers were by Doctor George A. Skinner, Colonel of the Medical Corps, Omaha, Nebraska. The first number was a paper entitled "The Great Importance of the Medical Profession in the Scheme of National Defense." This was a highly instructive as well as entertaining address. He held the attention of his audience throughout his rather long paper. The next was a moving picture entitled

"The Medical Department with Infantry in Combat." These were pictures taken of the movements of the Medical Corps, ambulances and so forth, upon the field of battle in France. They were very interesting. He had another series of reels entitled "The Defense Against Gas," but, owing to the lateness of the hour, it was omitted.

J. A. HOHF, M.D., Secretary.

## NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Dr. E. D. Augspurger, was honored by being elected mayor of his home city, Menno, S. D.

Dr. S. P. McDaniel, Mountain Iron, Minn., was recently married to Miss Fern Gavin, of that city.

Dr. B. S. Bundle will not remove to Denton, but will continue in general practice at Circle, Mont.

Dr. L. B. Casmey, Crookston, has moved to Moorhead, Minn., and opened offices for general practice.

Dr. R. J. Bartrom, Watertown, S. D., was honored by being elected president of the Rotary Club of that city.

Dr. E. O. Church, who has been in active practice at Menno, for several years, has moved to Vienna, S. D.

Dr. J. F. Adams, Aberdeen, S. D., has been named City Health officer, to succeed the late Dr. M. C. Johnson.

Dr. R. B. Kettlewell, a graduate of the University of Minnesota, has opened offices for general practice at Elysian, Minn.

Dr. L. H. Fligman, Helena, Mont., has been spending several weeks in New York, where he attended a course of medical clinics.

Dr. R. A. Crawford, chief surgeon at the Chamberlain Sanitarium, Chamberlain, S. D., died last month at the age of 44 years.

Plans are under way for the building of a modern hospital at Badger, Minn. It is expected to be completed for use in the early fall months.

Dr. O. J. Hagen, physician and surgeon, Moorhead, Minn., is one of the active members of the Board of Regents of the University of Minnesota.

Dr. W. H. McKenna, one of the oldest practicing physicians in Minnesota, died recently at his residence in Austin, at the advanced age of 89 years.

The Rosebud Medical Society held their April meeting at Winner, S. D., with the largest attendance of the season. A fine program was presented.

Mrs. James Blake, Hopkins, Minn., was one of the guest speakers at the annual meeting of the Iowa State Medical Society, held at Sioux City this month.

James C. Otis, a prominent St. Paul attorney, is the new president of the Ramsey County Public Health Association, succeeding the late Dr. H. Longstreet Taylor.

Dr. Charles H. James, one of the leading physicians of Broadus, Montana, died last month after a brief illness. Dr. James had been in active practice for over 20 years.

Sixty-one nurses were graduated from St. Mary's and St. Luke's hospitals this month. Dr. T. L. Chapman, chief of staff of St. Mary's hospital, presented the diplomas.

Dr. M. S. Henderson, president of the Minnesota State Medical Society, was the honored guest at the May meeting of the Southwestern Medical Society, held at Worthington.

Members of the Yellowstone Valley Medical Society held their monthly meeting at Billings on May 6th, Dr. A. R. Barnes, of the Mayo Clinic, being the principal speaker.

Dr. J. H. Hoskins, who has been associated with the Roan & Strauss Clinic at Bismarck for the past five years, has moved to Wahpeton, and opened offices for general practice.

Dr. Frank H. Allen, the oldest resident physician of Staples, Minn., died recently after a long illness. He had been connected with the Northern Pacific Railway for many years.

A 60 pound cake was presented to Miss Sophie Yoerg, superintendent of the Children's Hospital, St. Paul. The cake was two feet high and built to correspond with the new city hall.

The regular monthly meeting of the Stutsman County Medical Society, was held at Jamestown, N. D., on May 3rd, with Dr. Harry J. Fortin, Fargo, giving an interesting talk on "Arthritis."

The Southwest District Medical Society held their regular meeting last month at New England, N. D., with Dr. A. E. Spear, Dickinson, pres-

enting a paper on "The Most Common Eye Troubles."

Officers of the Minnesota State Medical Society extend a most cordial invitation to the members of North and South Dakota State Societies to attend the annual meeting at St. Paul on June 23-25.

Dr. Justus Ohage, 83 years old, veteran St. Paul physician, was honored recently at a luncheon, sponsored by the Pioneer Civic league of St. Paul, at Harriet island, which Dr. Ohage gave to the city.

Minneapolis has first place ranking among cities of from 250,000 to 500,000 population with regard to health work, the United States Chamber of Commerce and American Public Health association recently announced.

Dr. Henry L. Halvorson, Minot, was elected president of the North Dakota Health Officers Association; Dr. B. K. Killbourn, Fargo, vice president, and Dr. R. E. Whittmore, Bismarck, secretary, at the recent annual meeting held at Bismarck.

Dr. E. Starr Judd of Rochester, Minn., will retire as president of the American Medical association, during the organization's annual convention, which opened Monday May 9th in New Orleans. Dr. Edward H. Carey of Dallas, Texas, is the president-elect.

Governor Green, of South Dakota, has called a conference for May 26 and 27, at Huron, to be devoted to the problems of child health, education and care of handicapped children. Some thirty leading speakers have been invited to take part in the two-day sessions.

Examination of some 400 nurses from Minnesota, applying for registration by the state board of examiners of nurses was completed recently. The examinations were held in the capitol; St. Mary's hospital, Rochester; St. Mary's hospital, Duluth, and St. Vincent's hospital, Crookston.

Dr. Charles Singer, professor of the history of medicine at the University of London, recently presented two lectures at the University of Minnesota. Dr. Singer, author of many works on medical history, is at present visiting professor of history of science at the University of California.

Members of the Cass County Medical Society, at their April meeting, heard two papers by Fargo physicians. Dr. Carl E. Elofson discussed "More Common Complications in Pneumonia." Dr.

Ralph E. Pray, of the Dakota clinic, spoke on "Incidents of Childhood Tuberculosis in our Community."

Officers of the Women's Auxiliary of the Minnesota State Medical association are completing plans for the annual meeting to be held in St. Paul, Monday, May 23, in conjunction with the 79th conclave of the physicians of the state. Mrs. James Blake of Hopkins, president of the auxiliary, is directing plans for the program.

At the annual meeting of the South Dakota State Nurses Association, held at Yankton last month, officers for the coming year were elected as follows: Miss Mabel O. Wood, Mitchell, president; Miss Elvira Nelson, Rapid City, vice president, and Miss Vera Halver, Sioux Falls, secretary. The 1933 meeting will be held at Aberdeen.

The government should use private hospitals to care for disabled war veterans rather than build additional hospital units, Paul H. Fesler, superintendent of University hospital, Minneapolis, declared in an address before the Illinois, Indiana and Wisconsin Hospital association at Chicago. Over 30,000 beds now are available in the nation's private hospitals.

Medical men of national importance will participate in the annual meeting of the Minnesota State Medical association in the St. Paul auditorium May 23, 24 and 25. Leading speakers at the sessions will be Dr. Willis C. Campbell, Memphis, Tenn., orthopedic surgeon; Dr. Theodore M. Davis, Greenville, S. C., internist, and Dr. Ralph Major, heart specialist of Kansas City. At the annual banquet at Hotel Lowry, on the evening of May 24, Dr. W. J. Mayo will be toastmaster, while speakers will include Dean R. E. Scammon of the University of Minnesota medical school, and Rev. W. R. Sainsbury, Fargo, N. D., and others.

Dr. A. G. Pohlman, professor of anatomy in St. Louis University, has been named to succeed Dr. G. R. Albertson, who died Nov. 3, 1931, as dean of the school of medicine and professor of anatomy at the University of South Dakota. Dr. Pohlman has been professor of anatomy at St. Louis University since 1913. He received his M.D. degree from the University of Buffalo in 1900; was assistant in anatomy, 1900-01; instructor, 1901-03, at Cornell university; assistant in anatomy at Johns Hopkins university in 1903-04; assistant professor, 1904-06; associate professor, 1906-07; junior professor, 1907-08, and professor of anatomy in Indiana university from 1908 to

1913. The new dean of the medical school is a fellow in the American Association for the advancement of science, and in the Indiana Academy of Science. Dr. Pohlman is a member of the Collegium ete-rhinolaruygologicium, an international research organization with membership limited to ten men from each country. He is also a member of the Association of American Anatomists, Sigma Xi, honorary scientific society, Nu Sigma Nu, and Alpha Omega Alpha, honorary medical fraternities. Dr. Pohlman has contributed to the medical literature on the embryology of the nrogenital system, the circulatory system, and the hearing mechanism of invertebrates. He will assume his new duties at the university on June 1.

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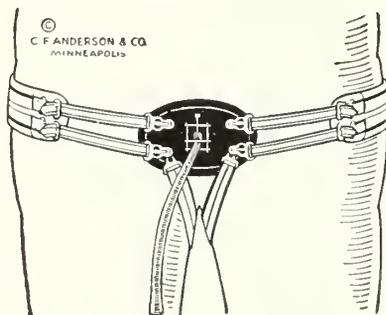
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## Tuberculosis Centuries Ago and Today with San Haven Problems\*

CHAS. MACLACHLAN, M.D.

*San Haven, N. D.*

THE year 1932 is noteworthy as chronicling the semi-centennial anniversary of a great discovery in the advancement of the science and practice of medicine and the scientific world rejoices in paying homage to the discoverer.

The incident giving birth to this memorial, marks the revelation of a scientific truth that has materially lengthened the span of human life. For centuries, through lack of knowledge of the direct cause of Tuberculosis and its tendency to spread, insidiously seeking other victims with no known means of control, it treacherously waylaid humanity and gathered in its gruesome product until it became referred to internationally as "The White Plague." Men, women, and children in all countries, irrespective of age or sex, from crowned head to peasant, became its victims. Entire families succumbing to its ravages, it was generally regarded as hereditary in its nature. Medical science assiduously yet vainly seeking its cause and control, stood mute and helpless in the presence of its onward sweep and its toll of human life steadily increased.

Contemporarily meantime, year upon year and century upon century of scientific study of its nature had step by step empirically demonstrated the facts severally that fresh air, sunlight, rest, wholesome food, and residence at

certain elevations above sea level halted its course.

However, it was not until the last century when the germ theory had been established as the origin of certain diseases and not until Robert Koch had, in 1882, successfully demonstrated that a bacillus, a microscopic entity, was the direct cause of Tuberculosis, and that its transmission to others would, under favorable conditions, reproduce its symptoms in them, thereby proving it contagious.

To Koch, therefore, and to all other scientific investigators who sought diligently along scientific lines to reveal this truth we solemnly and proudly pay homage.

Armed with this knowledge, its agencies of transmission to others were studied and revealed to science and thus became known to all civilized nations as science's greatest triumph over disease.

Since that time its victims have decreased in numbers as the transmission of this knowledge became more widespread, and in proportion to the consideration given by the afflicted to their individual responsibility in preventing others from acquiring the disease direct from them and further in proportion to the recognition and aid given by the public to those who are menaced through exposure to its contagion and to their further responsibility in financing early relief for those who are afflicted. Insofar

\*Presented before the North Dakota State Health Association's banquet meeting, Bismarck, April 27, 1932.

only do we increase our control and may we hope for its eventual demolition.

The desideratum in the control of Tuberculosis is an enlightened public, aware of its menace to life, and alive to the necessity of agencies for its control.

Only so far as the public is impressed with the importance of its control and to the extent to which enlightened men and women will co-operate therein will the percentage of the mortality of Tuberculosis continue to diminish.

The well recognized agencies in this effort are national, state, county, and social service organizations, backed up by generalized public opinion, the press, and co-operative effort in speeding the offensive.

Publicity of information covering the nature of the disease, the avenues of attack chosen by the bacillus, and of nature's methods of offering a successful defensive is the basis upon which organized effort may reach out into its strongholds and accomplish its ultimate defeat.

The patient attacked must first be sufficiently impressed with the conviction that he is afflicted with a serious disease, which, through criminal carelessness on his part may be transmitted to others. Aroused thus to a sense of his personal responsibility toward his family and his fellow man he will diligently employ every known means of preventing others from acquiring the disease from him. In so doing he should apply the precepts of The Golden Rule in fairness to his fellow man. He must realize that he is a unit of a vast throng of humans who have been attacked by an enemy laying siege to life, liberty, and happiness. He should also realize that there is interposed between him and the enemy a trained human intelligence, the public, a valiant host, fully equipped and offering a defense that with his aid is almost impregnable, and that this army is devoted to the cause, and determinedly bent upon its overthrow and destruction. He should place himself unreservedly in their hands, and co-operate in carrying out the disciplinary measures necessary to restore him to health, his family, and society.

The organized agencies mentioned have marshalled themselves into a mighty army behind whose lines they have constructed retreats or Sanatoria for those who have been wounded by the enemy. The injured one who responds early to the call, is admitted to a Sanatorium, and if amenable to discipline, does not long remain a burden to others, and is ere

long restored to the fighting line, but the injured one who delays in the acceptance of this aid, and by his presence in the home contaminates others, is a menace to the cause, and consciously or unconsciously is aiding the common enemy.

Our experience at San Haven in receiving and caring for these victims, varied and interesting, is for the most part encouraging, and rarely disheartening.

The individual who personally maintains himself while under treatment is almost invariably co-operative, gratefully appreciative, and very rarely criticizes, and if he does, it is a helpful criticism.

On the other hand it is a sad commentary upon human nature that we not infrequently find that the patient for whom the taxpayer sacrifices his earnings to restore him to health is carpingly critical, and for the most part unappreciative of the favor shown him, lacks in co-operation, and is prone to overstep privileges, even though he fares equally in every respect with the one who personally pays for his care.

With reference to broadcasting knowledge of the State Sanatorium at San Haven, we have been and are continuing to receive every courtesy from the press of the State.

Over a year ago we prepared a story of San Haven, including such information as we felt the public would want, and particularly the Tuberculous individual seeking admittance. This story embraces a description of its beautiful location on the southern crest of Turtle Mountains near Dunseith, and in the vicinity of the established International Peace Garden on the Canadian boundary north, its buildings, stac, and equipment, and the steps necessarily taken for admittance as a patient.

The newspaper article with pictured illustrations covering about two-thirds of a page of the ordinary county paper has already been published gratis by the official county papers in some twenty-five counties; first appearing in those furthest from the institution, where knowledge of its services were most meager.

We welcome the advent of visitors and their inspection of the Sanatorium, and will be particularly grateful for helpful criticism. We wish to thank the public, and particularly those in authority with whom we come in official contact, for their prompt and courteous co-operation. We are justly proud of our State

*(Concluded on Page 352)*

## Post-operative Care

H. H. HEALY, M.D., F.A.C.S.

*Grand Forks, N. D.*

FOR many years I have been convinced that of the three phases of surgical treatment, the last is the most often slighted or neglected. Many surgeons work their cases up beautifully, and make as near an exact pre-operative diagnosis as lies within their power. Then the operation is performed in a most painstaking and skillful manner, but at this point their concern seems to rest. From this point on they act as though their work is done, or, at least, that further treatment is so unimportant that an interne or any assistant is qualified to be left in charge of the routine care.

I consider the after attention and treatment is of vital importance to the comfort and safety of the patient. If a patient consents to have a serious operation performed, and all operations are serious in the eyes of the patient, be he lay or professional, he desires nothing more, and is entitled to nothing less, than personal attention by the surgeon until he is well on the road to recovery. Otherwise, he feels slighted and neglected, and probably a little apprehensive that he is not receiving proper treatment. If the surgeon personally dresses the wounds, examines and prescribes for the patient, he establishes a degree of confidence that induces a powerful ally—tranquility. He goes a long way in preventing nervous upsets that do actual harm—perhaps in a critical situation just enough to be the deciding factor in turning what should have been a recovery into a fatal ending.

Besides the good that personal attention of the surgeon does the patient in keeping up his morale, there is no one so competent as he to sense and fore-stall an impending complication. There is no one more competent than he to perform a stomach lavage, do a blood transfusion, or even give dextrose intra-venously, at least in the eyes of the patient. These routine measures of treatment seem quite commonplace to the surgeon, but to a very uncomfortable and apprehensive patient, they are of the greatest importance, and may be dreaded even more than the operation itself. The attentive surgeon, more than any one else, will note the first signs of a dry tongue, distended

intestines or stomach, phlebitis, pneumonia, etc., and give the patient the benefit of early treatment. As an illustration, let me cite a case I once observed in the hands of a very conscientious young surgeon.

The patient was a young woman with clear cut symptoms of exophthalmic goiter. Otherwise she seemed to be in excellent general physical condition. It was before the days of metabolism tests and iodine preparation. He did, however, put her to bed for a week and kept her quiet. At the end of that time she seemed ready for a relatively safe operation, which was done early one morning. The technique of the operation was good, for he was well trained. She left the table in excellent condition, and continued so until late in the afternoon, when she became a little restless, and her pulse became rather rapid. By evening she was a raving manic, and would have worn herself out before morning but for the fact that this young surgeon remained at her bedside all night, soothing her by his firm reassuring presence, and giving each dose of hypnotic, gradually increasing the amount and diminishing the time between doses, until towards morning she fell into a more or less quiet sleep, and the battle was won.

The above is an extreme case, but it serves to illustrate the value of personal attention of the surgeon, for I am sure we will all agree that this young woman would not have survived if he had left her in the care of an assistant and nurse.

Carrying out the idea of personal attention to the patient, even during the necessary absence of the surgeon, we have his written directions fully, carefully and precisely written in a legible hand by himself. It is not only slovenly to mutter a few general directions to the nurse as he walks out of the patient's room, but such practice is fraught with much danger. Even written directions, leaving too much to the discretion of the nurse, such as morphine P. R. N., or the usual diet, enementa P. R. N., are, to my mind, not to the best interest of the patient.

A much more orderly, exact and efficient

*(Continued on Page 354)*

## Xiphoiditis

J. E. ENGSTAD, M.D.  
Grand Forks, N. D.

**A** CHRONIC or sub-acute inflammation in the articulation between the xiphoid cartilage and the gladitorium of the sternum is not a rare disease. But it often escapes the attention of the clinician as he is apt to attribute the discomfort and sensitiveness due to pressure of clothing on the underlying structures; or more especially to ulcers of the lesser curvatures of the stomach, and at times even as a reflex disturbance from an inflamed and contracted gall bladder or an ulcer of the duodenal cap. Occasionally we have found this little cartilage intensely painful to the touch, and if manipulated it would cause excruciating pains to such a degree that any further examinations had to be discontinued. In a few of these cases I have observed that the pain seemed to be of a neuralgic nature, the pains radiating in a large area around the insertion into the breast bone of this offending little cartilage. In some cases that have come under my observation the pain was entirely limited to the articulation, and pressure at this point caused discomfort and pain.

*Treatment*—Enucleation may be performed under local infiltration. However, a general anesthesia is generally indicated, especially in

obese individuals. In a few of my patients who have submitted to operative procedure, I escaped entering the abdominal cavity. The operator should employ a technique that would assure him the peritoneum would be intact during the enucleation of the cartilage. Entering the abdominal cavity would not be a serious complication, but a technical blunder.

*TYPICAL CASE:* A.A. A rather stout woman, age forty, had for years suffered from pain and distress of the pit of the stomach and up to the xiphoid cartilage. She had been examined by a number of physicians who had palpated the region and invariably elicited a sharp and at times excruciating pain on pressure over the breast bone. Diagnosis had been repeatedly made of gall stones, ulcer of the stomach or duodenum, and of adhesions. She obtained considerable ease by wearing a corset, which was an armorial protection against pressure or disturbance of the little cartilage. At times the pain had been of such a character that she was verging on invalidism. Under local this offending cartilage was speedily removed, and with its removal all the distressing acute and chronic pain and general nervousness disappeared.

## TUBERCULOSIS CENTURIES AGO AND TODAY WITH SAN HAVEN PROBLEMS

(Continued from Page 350)

institution, and take pride and interest in giving our patients and the public adequate service.

Much overtime service is necessarily spent to make up for an attenuated medical staff. Our staff remains the same in number as three years ago, since which time our population and responsibilities have increased more than fifty per cent, while the total of the salaries received are today less than at that time.

We fully realize the strenuousness of the taxpayer in his efforts to provide hospitalization for the afflicted under the general financial depression. However, the economic necessity of instituting a department of orthopedics here and the further necessity for re-establishing

occupational therapy for cottage patients is pressing.

To the State Health Association our grateful thanks for this appearance and for their official co-operation.

To the State Tuberculosis Association, to the American Legion and Auxiliary, to the Lions and other service clubs, to the State Press, to the pastors who serve us, to the churches, Sunday Schools, bands, and other organizations for entertainment, and to individuals, who have severally, through various means at their disposal, contributed gratuities to the patients and to the institution, our heartfelt thanks, while to KFVY and our listeners-in, the aerial audience, we wish to extend our grateful appreciation of your courtesy.

We have the knowledge and the weapons to combat and annihilate our enemy, Tuberculosis. Shall we meet our obligation to humanity?

# The Justification of Collapse Therapy for Pulmonary Tuberculosis\*

EVERETT K. GEER, M.D.

*St. Paul*

SO MUCH has been written and said concerning the various measures used to insure more complete lung rest in treating pulmonary tuberculosis, that it may seem presumptuous to inject anything more into the literature on that subject. The virtue of any therapeutic measure must, however, stand or fall by the results noted over a period of time by reliable observers, and I therefore feel it worthwhile to report my results after using collapse therapy for pulmonary tuberculosis over a period of twelve years. These results, I am satisfied, constitute a sufficient justification for the enthusiastic continuation of the measures dealt with here.

No attempt will be made in this paper to review the literature on the subject nor to consider the dangers and complications of artificial pneumothorax phrenicectomy and extrapleural thoracoplasty. My experience with oleothorax is too limited to report on as yet, and I have not had occasion to resort to multiple intercostal neurectomy.

Before going into the question of results, I want to present briefly the indications which I am using for the respective measures. In Table No. 1 are found the indications for artificial pneumothorax for pulmonary tuberculosis. A few additional words of explanation may be helpful. The phrase "one good lung" does not imply one lung completely free from any and all evidence of tuberculous disease. It does imply a lung which, in the clinician's judgment, will be good enough to carry on when its partner has been thrown out of commission. In handling massive pleural effusions, it is unwise to aspirate more than 700 or 800 c.c. of fluid without injecting some air,

TABLE NO. 1

## INDICATIONS FOR ARTIFICIAL PNEUMOTHORAX FOR PULMONARY TUBERCULOSIS

1. One good lung.
2. Progressive disease (irrespective of stage).
3. Far advanced disease, especially with cavitation.
4. Recurrent and ungovernable hemorrhage.
5. Tuberculous pneumonia (lobar or broncho).
6. Massive pleural effusions.
7. Imperative necessity for shortening cure.

because too rapid expansion of a lung may induce pulmonary edema and very frequently causes annoying cough and pain and respiratory difficulty. The last indication may be laid to the "depression." It is a valid one in many instances.

In Table No. 2 are listed the indications I have followed in advising phrenicectomy for pulmonary tuberculosis. In using this procedure one can be less mindful of the condition of the contralateral lung because at most a good diaphragmatic rise throws not more than 25 to 35 per cent of the lung out of commission. The burden on the better lung consequently is much less than with pneumothorax or thoracoplasty.

TABLE NO. 2

## INDICATIONS FOR PHRENIC NEURECTOMY FOR PULMONARY TUBERCULOSIS

1. One good lung desirable—not absolutely necessary.
2. Unilateral basal disease (if fulminating, use pneumothorax first).
3. Cavitation (upper or lower lobe), if pneumothorax has failed.
4. Preliminary to every thoracoplasty.
5. Adjunct to pneumothorax (adhesions).
6. Preliminary to, or co-existent with, expansion after satisfactory pneumothorax period.
7. Early indolent unilateral case (Alexander).

Table No. 3 gives the indications for extrapleural thoracoplasty in treating pulmonary tuberculosis. It is well to emphasize the second indication as listed. Extrapleural thoracoplasty is truly major surgery, involving one to four (and even more) operations. It is a procedure notorious for the degree of surgical shock induced. It has an operative mortality varying from 10 to 20 per cent. All this knowledge must lead to a most critical selection of cases to be subjected to this form of collapse therapy. Pneumothorax and phrenic neurectomy can be used on acutely ill persons; to use thoracoplasty here is most unwise.

TABLE NO. 3

## INDICATIONS FOR EXTRA-PLEURAL THORACOPLASTY FOR PULMONARY TUBERCULOSIS

1. One good lung imperative (permanent collapse).
2. General condition satisfactory (able to stand major surgery).
3. All cases under No. 2 suitable for pneumothorax or phrenicectomy where these have been unsuccessful—preferably good chronic unilateral case.
4. Tuberculous empyema.

Tuberculous empyema does not warrant immediate thoracoplasty. Repeated aspiration, or formalin in glycerine or gomenol in mineral

\*Read before the Jubilee meeting of the North and South Dakota State Medical Societies at Aberdeen, S. D., June 2, 3, 4, 1931.

oil should be tried thoroughly before advising radical surgery. As a last resort thoracoplasty must be tried at times, and frequently achieves a cure. Thoracotomy for uncomplicated tuberculous empyema should never be done.

The tables showing results include patients on whom the various procedures were used up to the end of 1930. In using pneumothorax it has been my policy to keep the lung collapsed for five years, if possible. This is still the procedure of choice, and the patient is fortunate indeed who, needing collapse therapy, attains an effective collapse with air. The figures in the tables speak for themselves.

TABLE NO. 4

PNEUMOTHORAX RESULTS	
200 CASES	
Dead—73 (26 of these had incomplete collapse).	
Living—127.	
Of Living	
1. Expanded	45
Well	36
Poor condition	9
2. Still collapsed	82
Well and not in sanatorium	71
Doing well and still in sanatorium	9
Not good	2
3. Percentage in good condition either working or at home	53.5

TABLE NO. 5

PHRENICECTOMY RESULTS	
1. Basal lesions	13
A. Needed further collapse	2
B. Died	3
C. Unimproved	1
D. Well	7
2. Adjunct to pneumothorax	30
A. With expansion	7
B. Cavities held open by adhesions	23
C. Of these, number closed	9
3. Upper lobe cavities	71
A. Unclosed—further collapse	14
B. Died—no further treatment	11
C. Unimproved	24
D. Cavities closed	22

TABLE NO. 6

THORACOPLASTY RESULTS	
1. Number patients operated	75
2. Dead (progressive tbc.)	18
3. Operative deaths (60 days or less)	9—16%
4. Not doing well	18
5. Well	30—40%

Table No. 7 is included in answer to the many who have asked me whether patients who have been subjected to thoracoplasty ever return to work, and just what occupations they are able to pursue.

TABLE NO. 7

OCCUPATIONS OF "WELL" THORACOPLASTY PATIENTS	
Housewife	9
Stenographer	4
Nursing	2
Teaching	1
Publisher	1
Waitress	1
Clerk	2
Elevator operator	1
Bootlegger	1
Technician	1
Life of leisure	7

The percentage of favorable results when compared with usual figures dealing with easily cured conditions may not seem striking. In a previous paper<sup>1</sup> I made the following

statement: "Before passing judgment on these figures, it is well to reflect that no mild or transient malady has been under consideration. Progressive tuberculosis of the lungs is a deadly disease; it kills people, not quickly, as a rule, but with awful certainty. And if we have a measure or a combination of measures which, when advisedly used, will take a selected number of otherwise fatally ill persons, and put back to work from one-third to one-half of them, there can be no doubt that the achievement is nothing short of brilliant. Better results could have been, and certainly will be, accomplished with improvement in technique and a wider appreciation of suitable indications. For the present, however, let us be content with the firm conviction that the virtue of these procedures to accomplish more efficient lung immobility is definitely proved beyond any discussion." This opinion I still hold. Collapse therapy for pulmonary tuberculosis is here to stay until the specific cure is found. It is saving lives which otherwise would be lost. It is shortening the necessary period of institutional care. It is making patients safer as they return to a productive capacity. It has been justified beyond any and all cavil.

REFERENCES

1. Geer, Everett K.: Minnesota Medicine, Vol. 11, p. 21-24 (Jan.), 1928.  
The phrenic nerve operations reported above have been done by Drs. A. R. Colvin, L. E. Daugherty, E. M. Jones and D. G. Gardiner of St. Paul. The thoracoplasties by Drs. L. E. Daugherty, D. G. Gardiner, A. Schwyzer and H. B. Zimmerman. Their co-operation is acknowledged with gratitude.

POST-OPERATIVE CARE

(Continued from Page 351)

routine would be to order morphine sulph. 1/6 gr. hypo., 9 p. m., if in pain or restless, and repeat the dose four hours later if still restless. The ordinary night nurse is apt to put off an enema to the last minute, unless there are definite instructions as to when and how often it must be given. So much depends upon what goes into the stomach during the first few post-operative days that nothing should be left to chance. At first every ounce of water, gingerale, tea, etc., should be specifically ordered as to amount and time. After the digestive system is in condition to absorb nourishment the same care should be taken as to kind of food, amount and frequency.

Not only is this exactness good for the patient; it is good for the surgeon, as it tends to develop an orderly, scientific mind and create in him a deep personal interest in the patient.

## Viability of *B. Diphtheriae* and *Staphylococcus Aureus* on a Knife Blade

A. W. ECKLUND, M.S.

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**D**URING an altercation on the night of November 11, 1930, a Deputy Sheriff was stabbed in the epigastrium with a large skinning knife, by the village blacksmith. The blade penetrated the abdominal wall, and left thoracic cavity. While attempting to escape, the blacksmith suffered a bullet wound through the leg, and both injured men were brought to a local hospital the next day.

The bullet wound healed rapidly, and caused no further concern. The stab wound in the Deputy Sheriff progressed nicely from November 12th to November 17th. On this date, five days after the original wound, severe toxic symptoms developed, a grayish membrane became visible on the wound, a direct smear was taken, and examined microscopically by the hospital pathologist, who reported the results as follows:

"Smear shows the presence of staphylococcus, streptococcus, a spore bearing rod and *B. diphtheriae*, the latter in large numbers." Fifty thousand units of diphtheria antitoxin was immediately given the patient. The hospital pathologist brought the smear to me for confirmation. I examined the smear and found large numbers of *B. diphtheriae*, the morphology being the small granular type of Westbrook. Since the granular type predominates in clinical diphtheria, I confirmed the pathologists' observation and gave my opinion that the wound was infected with diphtheria bacilli, and as the wound was five days old, the time would correspond to the correct incubation period of *B. diphtheriae*. The next day, November 18, the hospital pathologist inoculated a guinea pig with material directly from the wound, the time interval being insufficient for a virulence test. The pig died next day. We were then practically certain that we were dealing with a diphtheretic infection. On November 19, the patient died, cause of death given as pneumoemothorax, peritonitis, and septicemia. The wheels of justice moved, and on November 21 the Coroner submitted to me

for medico-legal examination the sheath and knife that was alleged to have been used in the stabbing affair.

I examined this knife with a hand lens, and found on the blade a trace of a reddish yellow substance, which I scraped off with a sterile knife and placed in a bottle. I then cultured the entire blade with a moist swab, and inoculated two tubes of Loefflers blood serum. The leather case of the knife was next examined, both inside and outside, with no indication of blood on or in the case. I then cultured the inside of the knife case on Loefflers blood serum. The results of these cultures indicated that on the knife blade *Staphylococcus pyogenes aureus* and two organisms belonging to the *B. subtilis* group, intensely proteolytic, were present in considerable numbers. The presence of these organisms on the knife blade indicated that it was in an unsterile, infectious condition. The same organisms were recovered from the inside of the leather knife case. The diphtheria bacillus was not found.

The Benzidine test on the yellowish substance scraped from the knife blade proved it to be blood, but there was insufficient blood for the precipitin reaction to determine if human blood.

In attempting to account for the presence of *B. diphtheriae* in the wound of the Deputy, among other possibilities, I suspected that the blacksmith might be a diphtheria carrier, and had transferred this organism to the wound, by the knife. Upon culturing the throat, I found this assumption correct. The *B. diphtheriae* isolated from the throat had the same morphology as the *B. diphtheriae* in the wound of the Deputy. In spite of two attempts to prove these organisms virulent, both guinea pig inoculations were negative, and I was forced to the conclusion that the diphtheriae in the throat were avirulent.

Even though the diphtheria bacillus isolated from the throat proved avirulent, I, as an expert witness for the state, anticipated ques-

tions relative to the viability of *B. diphtheriae* or staphylococcus on a knife blade under adverse biological conditions of food requirements, moisture, heat and dissipation. I, therefore, performed the following experiment to determine the possibilities.

A pure culture of *B. diphtheriae* was secured from a clinical case of diphtheria and subjected to the virulence test, the organism proving highly virulent to guinea pigs, causing death in thirty-six hours. A pure culture of *Staphylococcus aureus* was likewise secured from a case of acute tonsilitis. Two large kitchen knives were secured but no attempt was made to clean them thoroughly, the object being to duplicate the conditions of an "ordinary knife." The knives were sterilized by dipping in alcohol and flaming. The blades of the knives were then marked with a wax pencil into areas about one-half inch square. A light broth suspension, turbidity 1,000, was prepared from the culture of *B. diphtheriae* and the *Staphylococcus aureus* culture. With the

of the areas on each knife, and tubes of Loeffler's blood serum medium were inoculated, incubated over night, and the tubes examined for colonies, a slide prepared for same, stained by Alberts method, and examined microscopically. At longer intervals a virulence test was performed on the *B. diphtheriae* organisms. The following table illustrates the time intervals, dates of culturing, virulence tests, length of viability of the organisms and remarks:

From the above table it will be seen that the *B. diphtheriae* maintained its viability, morphology and virulence for a period of twelve weeks and two days. The *Staphylococcus aureus* showed no signs of diminution of its viability. The *B. diphtheriae* is considered a true parasite and it is rather remarkable that it is able to maintain its viability on a piece of metal under adverse conditions of temperature, lack of moisture and food requirements for the above length of time. Sternberg<sup>1</sup> proved that the *B. diphtheriae* could live in pieces of dried membrane after fourteen weeks, but this is

TABLE I

Date of Culturing	Results of <i>B. Diph.</i> Culturing	Results of <i>Staph.</i> Culturing	Virulence Test <i>B. Diph.</i>	Remarks
Jan. 14	Inoculated Knife Blade	Inoculated Knife Blade	Positive	Dried and placed in envelope in laboratory drawer.
Jan. 15	+	+	None Performed	<i>B. diph.</i> growth luxuriant. <i>Staph.</i> growth luxuriant.
Jan. 16	+	+	None Performed	<i>B. diph.</i> growth luxuriant. <i>Staph.</i> growth luxuriant.
Jan. 17	+	+	None Performed	<i>B. diph.</i> growth luxuriant. <i>Staph.</i> growth luxuriant.
Jan. 19	+	+	None Performed	<i>B. diph.</i> growth luxuriant. <i>Staph.</i> growth luxuriant.
Jan. 21	+	+	None Performed	<i>B. diph.</i> involution forms. <i>Staph.</i> growth luxuriant.
Jan. 22	+	+	None Performed	<i>B. diph.</i> involution forms. <i>Staph.</i> growth luxuriant.
Jan. 24	+	+	Positive	Typical diphtheritic lesions. Pig died in 35 hours. <i>S.</i> growth luxuriant.
Jan. 27	+	+	None Performed	<i>B. diph.</i> moderate growth. <i>Staph.</i> growth luxuriant.
Jan. 29	+	+	None Performed	<i>B. diph.</i> moderate growth. <i>Staph.</i> growth luxuriant.
Feb. 2	+	+	None Performed	<i>B. diph.</i> moderate growth. <i>Staph.</i> growth luxuriant.
Feb. 7	+	+	None Performed	<i>B. diph.</i> moderate growth. <i>Staph.</i> growth luxuriant.
Feb. 8	+	+	None Performed	<i>B. diph.</i> moderate growth. <i>Staph.</i> growth luxuriant.
Feb. 16	+	+	None Performed	<i>B. diph.</i> moderate growth. <i>Staph.</i> growth luxuriant.
Feb. 28	+	+	None Performed	<i>B. diph.</i> moderate growth. <i>Staph.</i> growth luxuriant.
Mar. 11	+	+	Questionable	Severe adenitis, but pig recovered. <i>Staph.</i> growth luxuriant.
Mar. 26	+	+	None Performed	<i>Diph.</i> scanty growth. <i>Staph.</i> luxuriant growth.
Mar. 29	+	+	Positive	<i>Diph.</i> scanty growth. Pig died in 36 hours.
Apr. 10	+	+	Positive	Only 10 colonies <i>B. diph.</i> Pig died in 36 hours. <i>Staph.</i> luxuriant growth.
Apr. 12	+	+	None Performed	<i>B. diph.</i> negative. <i>Staph.</i> luxuriant growth.

aid of a sterile swab, one knife blade was lightly swabbed with the *B. diphtheriae* suspension and the other blade with the *Staphylococcus aureus* suspension. The knives were allowed to dry at room temperature, placed in ordinary brown paper envelopes, marked for identification and placed in a laboratory table drawer. A control tube of each organism using Loeffler's blood serum medium was inoculated and placed in a laboratory table drawer. The temperature of the room varied from 60°F. to 80°F., and at no time reached incubation temperature, namely 98.8°F. At various intervals, usually three or four days, a sterile moistened swab was touched on one

hardly comparable to the fact that it could maintain itself for a period almost as long on a metal knife blade.

The *Staphylococcus*, being the most resistant of the purely vegetative forms of organisms, remained unchanged under the above adverse conditions for the entire period of twelve weeks and two days with no diminution in its viability. The controls of both organisms remained unchanged.

## SUMMARY

1. *B. diphtheriae* which proved non-virulent upon further examination were isolated from the throat of the murderer and from the stab wound of the victim,

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### OUR FRIENDS AND CO-WORKERS

At the Editorial listening post, we were pleased to note the response to President Hoover's Hospital Day proclamation.

Beautiful recognition of the great strides that have been made in attendance upon the injured and ailing was voiced by both urban and rural press of Montana, North and South Dakota and Minnesota.

Such tributes do much to create a better understanding of our profession by the laity. And in this connection, we are thinking of our many scientifically trained co-workers in institutions everywhere; nurses, pharmacists and dentists, both in and out of hospitals, who have a tremendous influence in disseminating information and moulding public opinion. They are our friends and helpful associates, they know and understand us and we are pleased to have our aims and purposes shared and interpreted by such as these.

A. E. H.

### MEDICAL PROGRESS IN THE LAST TEN YEARS

It is well from time to time to take stock of what we have and of what is going on around us. It is sometimes difficult for one close to the changes that are taking place from day to day to realize the extent of the movement in a year or in ten years. It is sometimes difficult, since Pasteur's discoveries have lead to so much progress, to realize that we owe anything to the

past, but this is another story. In the same way we are so close to much of the research and the studies that are reported every week that it is impossible to evaluate them; for example the recent developments in the chemistry of body fluids and tissues, the experimental work still going on with bacteriophage, and Dr. Kendall's making formerly invisible germs visible may well lead to important changes to be recorded later; but again this is another story.

To think then of a few of the changes in the last ten years that may be listed as representing progress, perhaps the use of liver and of stomach in the treatment of anemia would come to mind first. In many respects the use of these substances is quite parallel to the development of a little over a decade ago of insulin in the treatment of diabetes. Neither is a cure, but as with insulin in diabetes, the physician can now approach the case of pernicious anemia with confidence in being able to bring and to hold the condition under control.

The idea of the vitamins is not quite new, but goes back to about 1911; the last decade, however, has seen much study in the field, and the literature, and with it our understanding and even the terminology and the classifications, has become very different. Probably the outstanding recent achievements have been the demonstration that pellagra is a vitamin deficiency condition and the preparation of Vitamin D chemically or synthetically.

In the field of the infectious diseases, Undulant Fever, formerly called Malta Fever and supposed to be confined to the "Mediterranean shores with a few foci in the tropics and goat raising districts," has come to be recognized as occurring not infrequently in the United States; its nature and its prevention have become pretty well understood. Tularemia, fortunately not very common, would be thought of by any doctor in making an examination and a diagnosis. Rocky

Mountain spotted fever has become better understood, and particularly does it seem that certain conditions formerly confused with typhus fever are related to if not identical with the spotted fever. Diphtheria antitoxin is of course not new, but immunization against diphtheria has had extensive trial in the last ten years and has stood the test well. New York City within the last three years through the aid of Milbank Foundation has staged an extensive toxin-antitoxin campaign or demonstration with striking and gratifying results.

H. E. F.

#### IMPORTANCE OF CURRENT MEDICAL LITERATURE

Nearly 30 years ago at Carney Hospital, Boston, Dr. John Munro said "medical books are old five years after their publication."

Subsequently Dr. W. J. Mayo, in his clinic, stated that when the book in which he had described his operation for gastro-intestinal anastomosis came off the press, he was no longer using that method, having changed from the long to the short loop.

Medicine makes such rapid progress that some books are actually out of date when they come off the press. We do not mean by this to discourage the purchase of medical books. We do, however, wish to emphasize the importance and necessity of keeping abreast with the advances made in medical science from day to day and month by month, through the perusal of the literature which may be found first in current medical journals.

Many are prone to lay journals aside when they are delivered, for more leisurely moments. This is a mistake. Every journal should be glanced through on the day of its arrival. Subjects of special interest should be blue penciled and turned over to the office attendant for card cataloging; a small card, giving the subject and salient points or concluding summary, as well as the date and periodical in which it was published is all that is necessary. In this way it may later be referred to, should occasion arise. This is a habit that may easily be acquired and is the surest way of keeping up to date.

We recommend it most heartily to our readers.

A. E. H.

## Proceedings of the Minneapolis Clinical Club

Meeting of March 10, 1932.

**T**HE regular monthly meeting of the Minneapolis Clinical Club was held in the Lounge of the Medical Arts Building on Thursday evening, March 10, 1932. After dinner the meeting was called to order at 7:00 p. m., Dr. Archie Beard presiding.

After a short business meeting, the following scientific program was presented:

Inaugural Dissertation—"Practical Considerations of Prostatic Pathology," by Dr. William P. Herbst.

Before taking up many phases of prostatic pathology which are of practical everyday importance, it is well worth while to consider the relation of the activity of the bladder wall to conditions in the bladder neck. Too much stress has been put upon the size of the prostate to the palpating finger per rectum and not enough upon the dynamic musculature of the bladder itself. It is a fact that actual mechanical intra-urethral prostatic obstruction may be extreme, and yet the patient having this obstruction may be perfectly capable of completely emptying his bladder. The reason he

is able to accomplish this is because he happens to be one of those fortunate individuals who has a very strongly-acting bladder musculature.

In all considerations of bladder neck obstruction, the bladder wall status is every bit as important as the actual condition of the bladder neck itself. It is very embarrassing to the surgeon to remove a very large, definitely obstructing prostate gland and find that the patient is still unable to empty his bladder, and upon investigation find that this inability to empty the bladder is due to some neurogenic disturbance which has rendered the bladder wall incapable of proper functioning.

The status of this bladder wall can be recognized in several different ways. First of all, upon simple catheterization the urine is seen to flow from the catheter rapidly, or hardly any flow at all, or any gradation between these two extremes. This observation alone is of considerable value in making a rough estimate of the integrity of the muscle.

Secondly, upon cystoscopy, we find a lax

appearing bladder, with relaxation of the internal sphincter to variable degrees.

Thirdly, cystography renders a cystogram which usually clearly indicates the condition of the bladder musculature.

The pathology of the prostate of most importance comprises inflammatory conditions, adenomatous hypertrophy, malignancy, and calculi. Prostatitis is present in some degree in about one-third of all adult males, as evidenced by the finding of pus and bacteria in the expressed prostatic secretion. In most instances this infection is symptomless, and therefore almost universally unrecognized. The types of organisms most frequently found in the prostatic secretion are the staphylococcus, streptococcus, and colon bacillus, and after these, most any one of many other types of infection. The manner of infection of the prostate gland is usually hematogenous. However, there may be infection of the prostate from the vagina of the female and from sources of infection in the genitourinary tract itself, which may be carried either by direct continuity of tissues or through the lymph or blood stream. A most frequent group of infecting foci consist of devitalized and grossly infected teeth, infected tonsils, and accessory nasal sinuses.

The symptomatology of acute prostatic infection is most frequently the picture of acute pain in the region of the prostate itself, and, usually, extreme frequency and dysuria. However, some acute infections fail to carry these urinary symptoms to any extent, but in their place have pictures which simulate various types of abdominal pain, lower extremity pain, and even the picture of acute appendicitis, diverticulitis, intestinal obstruction, or other obscure abdominal complaints.

The differentiation between acute prostatic infection and these various other types of complaints is usually accomplished by rectal palpation of the prostate gland and thorough physical examination of the abdomen itself. Upon rectal palpation we find the exquisitely tender prostate which may be objectively negative as far as the consistency and contour of the gland is concerned at the first examination, and upon abdominal palpation we note the absence of localized tenderness that would direct our attention to any of the various viscera that might be the object of referred pain from the prostate. The prostatic secretion would contain pus, and the white blood cell count would

reveal usually a moderate leucocytosis, and, in some instances, a degree of leucocytosis up to 20,000 or more.

The handling of these acute cases should consist, in most instances, of watchful waiting, along with sedatives, urethral catheterization if unable to accomplish bladder emptying when necessary, and alkalization of the urine, along with a bland diet. Surgical drainage by way of the perineum should be resorted to only when fluctuation is present and the symptoms are very acute and the probability of rupture into the urethra with drainage seems to be unlikely.

Acute infections of the prostate may produce just as serious a picture as most any other condition that we have to deal with.

Diagnosis in the chronic infections is accomplished by rectal findings and examination of the prostatic secretion. In examining the prostatic secretion, the best method happens to be very simple and rapid. The prostate is massaged immediately following the emptying of the bladder, so that the secretion may be obtained free from urine mixture and contamination. The secretion should be caught on a slide and examined wet under the microscope. This procedure can be done about as rapidly as it takes to tell about it. One frequent error is to massage a prostate, obtain no secretion, and advise the patient that his prostate is perfectly all right, and that there was nothing coming from it. In most instances the failure to obtain secretion is due to inflammatory occlusion of the prostatic ducts. The other rare possibility is that the secretion may have found its way into the bladder instead of coming out through the urethra where it can be collected.

Staining of prostatic secretion for microorganisms is generally very unsatisfactorily done. A stain of a prostatic secretion that has any amount of normal constituents present results in either a complete washing off of the smear, or in large colloidal gobs of stain which make it practically impossible to identify microorganisms that may be present. In order to overcome this difficulty, the prostatic secretion obtained on the slide may be diluted with four or five drops of distilled water, allowed to dry and stain, or the secretion may be collected in a centrifuge tube which has in it three or four cubic centimeters of distilled water, thoroughly mixed, and then the centrifuged portion stained. In this way, satisfactory staining can always be accomplished.

From the standpoint of symptomatology, the chronic infections may be divided into those which are symptomless and those which produce symptoms. By far the greater proportion of chronic prostatic infections are symptomless, even to the extent of failing to result in the finding of pus in the average urinalysis.

Chronic infections may result in a sense of general fatigue, indefinite mild lumbar or lumbosacral discomfort, an inability to concentrate mentally, and a general sensation of being below par physically. It is this type of patient that goes without a diagnosis, because of the fact that the prostate is one of the last things that is thought of in complaints of this nature.

There is another group of individuals who have a definite sense of discomfort in the region of the prostate, usually exaggerated at the time of stool and immediately following, and frequently for a 24-hour period after sexual intercourse.

Frequency is another rather common symptom occurring not only during the day but during the night as well. Radiation of mild pain down the legs, out through the penis, and upward through the inguinal regions or abdomen may occur. In addition to these pictures there may be associated chronic inflammatory lesions involving any tissue of the body from this prostatic infection acting as a focus.

The late results of prostatic infection existing over a period of years may become manifest by an infected adenomatous hypertrophy, producing variable degrees of obstruction, and the small hard cicatricial prostate, which becomes obstructive because of the process of cicatrization secondary to the inflammation. How frequently do you recall seeing a man with a large adenomatous prostate who overnight changes from the status of a comfortable individual, able to empty his bladder, to one who is unable to empty his bladder, with a resultant acute retention? These individuals have not suddenly become unable to empty their bladder because of the adenoma alone, but because of just a little lighting-up of the chronic infection which is sufficient to increase the obstruction to a point where bladder emptying becomes impossible. The small cicatricial type of prostate usually manifests itself by a gradually increasing difficulty in emptying the bladder, and a gradually diminishing stream with, usually, frequency and dysuria of long standing.

The treatment of chronic infections of the prostate depends entirely upon the individual case. In the group of patients who have no symptoms, and the presence of prostatic infection is an accidental finding during the course of a general examination, the patient should be advised of the situation, and told that treatment should be followed out. However, I do not feel that treatment in these cases should be too strongly urged, because patients who have no complaint may fail to see where they are deriving any benefit therefrom.

In the group of patients whose complaint consists mostly of a general below-par feeling, and some indefinite lumbosacral pain, and fatigue, these should be advised to have treatment. It is in this group of patients that we nearly always find an immediate response to treatment in that they have a definitely improved sense of bodily well-being, their appetite is usually improved, they lose the back discomfort, and are able to concentrate, and do things which they were unable to do before.

In the group of patients who have definite pain in the region of the prostate, along with various other manifestations, there is no question about the advisability of treatment.

In the group of patients who have large adenomatous prostates and suddenly develop retention, they unquestionably should be treated, and most certainly should not be sent into the hospital with immediate prostatectomy in mind.

In the group of patients with chronic cicatricial prostates with obstruction, these should by all means be treated. This group is one of the most unsatisfactory groups to attempt prostatectomy on. In the first place prostatectomy is technically difficult and usually consists of whittling away enough of the gland to do away with the actual obstruction and in addition to this the actual complaints, i.e., dysuria and frequency, are probably going to be just as bad after surgery as they were before, and this should always be kept in mind in advising surgery in this group of patients.

Treatment itself consists not only of one thing, but of many things. First and extremely important, is the elimination or treatment of other foci. Infected and devitalized teeth should be extracted; definitely infected or questionable tonsils should be removed, and infection of the nasal sinuses treated before treatment of the prostate is inaugurated, except in the cases where obstruction demands

bladder emptying. After the foci have been taken care of, treatment should consist of prostatic massage per rectum from one to three times a week depending upon the reaction of the individual to treatment. Unfortunately there are a few patients who will not tolerate any form of prostatic massage or urethral manipulation and in this type of individual local treatment most certainly should not be persisted in.

The one most beneficial form of treatment is prostatic massage. In addition to this, the other measures which are used are hot sitz baths, hot rectal irrigations, urethral dilation and instillation, tonics of various kinds, stock or autogenous vaccine administration, and shock therapy with mercurochrome, aolan, activan, typhoid vaccine, or any of the general foreign proteins which you may desire.

It is an excellent plan to treat these patients for a period of six weeks and then discontinue all treatment, regardless as to whether or not the amount of pus in the secretion has completely disappeared. A rest period should then be given for from one to two months, and then a recheck of the prostatic secretion made to determine the necessity of further treatment.

Unfortunately there is no criterion which we can use to determine which cases are going to respond with complete clearing up of the infection after treatment and which are not. Many times those which we think are the worst clear up rapidly, and those which we think are very mild fail to clear up. It can safely be said, however, that rarely do they fail to experience definite satisfaction from treatment.

Adenomatous hypertrophy of the prostate is important to the individual only when it prevents him from emptying his bladder completely. When incomplete bladder emptying does occur and infection of the urine develops along with impairment of renal function, measures must be taken to relieve the obstruction. In the last 15 years the handling of this type of obstruction has become safer and safer. The mortality has shrunk from 25 to 50 per cent down to about 5 per cent, and this includes the worst along with the best risks. This reduction in mortality has been accomplished through (1) careful preliminary preparation, (2) improvement in the type of anesthesia, and (3) more intelligent postoperative management. It is of interest to remember that the mortality in prostatectomy in patients over 70

years of age is about four times that in patients under 70 years of age.

The question of complete retention of the urine is now somewhat controversial, in that we are now having advocated complete emptying of these acute retentions rather than the various methods of graduated relief. It still would seem that gradual decompression of the over-distended bladder is the best procedure, although we may have to change our minds about this, if more satisfactory evidence is brought out to substantiate the practice of complete emptying.

The use of urethral catheterization in these obstructive cases as a preliminary preparation for prostatectomy is very important, mainly from the point of knowing when urethral catheterization should be used and when it should not be used. In the patients who have their bladder emptied by urethral catheterization three times a day, who do not respond to this procedure by development of acute urinary tract infection, this is by far the most satisfactory method of preparation. However, in the patients who develop chill and fever with a definite picture of acute urinary infection, this method should immediately be discontinued and suprapubic drainage established, and, when suprapubic drainage is established, it should be adequate. There are many instances where patients have died because suprapubic drainage consisted of a small-calibered catheter instead of a large-sized tube.

The practical value of the blood urea estimation and the phenolsulphonephthalein return is very important. While patients are under preparation for operative procedure, these estimations should be made at about five-day intervals, so that the renal function can be accurately estimated.

In addition to these laboratory procedures we must not forget that such simple things as the patient's appetite and general strength are of equal importance. The appearance of the tongue is one of the best indicators of the status of the patient's general condition, and should be carefully and constantly observed.

As far as the operation of prostatectomy itself is concerned, that is merely an incident in the handling of the case. The postoperative care is very important, and adequate fluid intake, circulatory stimulation where needed, and getting the patient out of bed on the third or fourth day, if possible, are important fea-

tures. The fluid intake should be carefully watched, and, where the circulatory system is not competent, this may be a very vital factor in the outcome. Many patients are killed with circulatory failure, because of the overburdening of the circulatory system with enormous amounts of fluid. Each individual must be treated as a separate entity in this respect, remembering that anything over 3000 cc. in 24 hours will do in most cases.

Those patients who have a stormy convalescence and are unable to take nourishment satisfactorily, duodenal feeding sometimes will make the difference between saving or losing the patient.

A very important advance in the handling of all prostatic obstructions is now fairly well established. The various types of urethral procedures for removal of portions of the prostate gland are very rapidly becoming perfected. At present practically all of the moderate prostatic enlargements, and especially those involving the median lobe alone, lend themselves to the punch or cystoscopy resection method. In the extremely large intra-urethral adenomatous hypertrophy cases, however, prostatectomy is the better procedure.

In comparing urethral procedures and surgical procedures, we must not lose sight of the fact that the urethral procedures carry a very definite mortality, which is probably around 2 or 3 per cent. In order to obtain the best results with urethral procedures, the patients have to have the same careful preliminary preparation as for prostatectomy.

Theoretically, the only objection that can be advanced against the various urethral procedures as compared with surgery, is that, in the cases in which much infection is present, the patient does not derive the benefit from the removal of a large mass of infection with urethral procedures that he would with complete surgical removal. This is a very technical objection, however, and certainly should not in most instances result in the choice of surgery over the urethral procedure.

Malignancy of the prostate is a very uniformly handled condition today. The simplest methods are most likely the best. In the cases in which it is felt that the malignancy does not involve the prostatic capsule, surgery is in most instances indicated, except, of course, in those cases where distant or pelvic metastases are demonstrated.

In cases where the capsule and surrounding

tissues are involved the procedures to be used are radium implantation and deep X-ray therapy. If obstruction occurs, this obstruction can be handled by self catheterization, permanent catheterization, permanent suprapubic drainage, or the use of one of the prostatic punch instruments, where technically feasible. It should not be lost sight of that many malignancies of the prostate are very slow growing, and any type of treatment to relieve the obstruction—whether it be a punch procedure or suprapubic drainage—should not be denied the patient when indicated. Some of these malignant conditions go on for two or three years or more after the initial diagnosis of an inoperable condition is made.

Prostatic calculi may be either single or multiple, and they do not occur very frequently. Nearly always there is an accompanying infection. They are very readily recognized by X-ray pictures, and in many instances appear as though there was a bunch of buckshot in the prostate gland. In some instances, as far as the X-ray pictures are concerned, single prostatic stones may be confused with bladder stones. This, of course, can readily be differentiated by cystoscopy.

From the standpoint of symptomatology, prostatic stones do not cause any symptoms except what may be caused by obstruction that they may produce or infection which accompanies them. In the cases in which the prostate is the seat of one large prostatic stone that lies close to the urethra, it may not even be palpable per rectum. In other instances in which most of the prostate gland has been squeezed to a thin capsule by an enlarged stone, the stone may be suspected by the stony hardness appreciated by rectal palpation.

In the cases with multiple stones, rectal palpation elicits a definite crepitus produced by the grating of one stone upon another, or in some instances even a shotty feel can be made out through the prostatic capsule. The single prostatic stones which produce obstructions have to be removed either through the cystoscope or surgically, depending upon their size and technical difficulties in removal. Multiple prostatic stones should not be disturbed unless the patient is having some serious infection as a result of those stones, and then the only thing to be considered is a prostatectomy, because, in cases of multiple stones, the entire gland is usually involved.

Surgical procedures in these multiple stone

cases should not, in my opinion, be urged strongly nor should the patient be promised that when he has had his prostate removed he will be symptom-free and comfortable, because, as so often happens in the cases of chronic cicatricial prostates that are removed, the symptoms of frequency and dysuria often persist after surgery.

## DISCUSSION

DR. KENNETH PHELPS: What is the value of the recent urinary antiseptics as administered by mouth?

DR. HERBST: In regard to the value of various urinary antiseptics in the treatment of prostatic infection, there is no one antiseptic that is ideal in all patients. The cases in which there is accompanying infection from the upper urinary tract or the bladder will need a urinary antiseptic of some kind. Urotropin, Caprokol, Pyridium, Serenium are all satisfactory. As a general rule in the coccal infections Caprokol, Pyridium and Serenium are usually better. In the colon bacillus infections Urotropin is usually the better.

Massage alone is by far the best treatment for the chronic prostatic infections, and if only one agency is to be used, this would be by far the best. In some cases where there is marked dysuria, simple alkalization alone is the best from the standpoint of the comfort of the patient. The administration of large quantities of water, the interdiction of all condiments, and the use of a bland diet are all helpful measures.

DR. ARCHIE BEARD: I would like to ask what is the prognosis between streptococcus and staphylococcus infection of the prostate.

DR. HERBST: I have not been able to see that there is any particular difference in the response of the infection of the prostate gland as far as the type of infection that is present. There is one factor, however, that is very important in the coccus type of infection, and that is the presence or absence of other foci of infection. Patients who have dental, tonsillar or sinus infection will frequently be very resistant to treatment until these foci are treated or cleared up. Occasionally all that is necessary in order to clear up a chronic prostatic infection is to clear up another focus which was the original site of the infection which was carried by the blood stream to the prostate.

DR. JAMES M. HAYES: I haven't anything to add, but I want to commend Dr. Herbst on this very excellent summary of genito-urinary problems.

In a recent editorial in *Surgery, Gynecology and Obstetrics*, Dr. Bartlett discusses the biological preparation of the patient for surgery. This is well demonstrated in surgery of the prostate. The preliminary treatment is a very important factor.

Dr. Herbst's enthusiasm over the prostate as a focus of infection no doubt is well founded. I have followed some of his cases and am satisfied that massage and other treatment of the infected prostate does give results in certain infectious conditions.

DR. JAMES KERR ANDERSON: I would like to have Dr.

Herbst say a few words about this new method they are using for removal of bars, etc., whereby they use some sort of electrical treatment. I know Caulk is using it. I think that was a very practical discourse, and I enjoyed it very much.

DR. HERBST: Caulk's punch is very similar to the instrument that I have passed around. The cutting blade in the Caulk punch, however, is heated electrically, so that it sears as it cuts, thereby producing satisfactory hemostasis. The technique as Caulk uses it is very nicely timed, and it is upon the proper timing that the results depend in large measure. I do not believe that anyone else can use this instrument quite as well as Caulk himself. He, of course, was one of the pioneers in the use of any type of punch instrument, and now uses it in at least 80 per cent of all of his prostate cases.

I would like to re-emphasize the following facts about various urethral procedures: First, that any one of the various instruments now available will be satisfactory if one will learn to use it; second, the mere fact that more than one sitting is necessary in many cases should not contra-indicate their use; third, it is just as important to have preliminary and postoperative care in these procedures as in prostatectomy; and lastly, one should not forget that even though the mortality in these intra-urethral procedures is lower than surgery, the fact still remains that the mortality will average around 2 per cent or more.

Dr. C. A. McKinlay reported two cases of "Mesenteric Thrombosis." These Case Reports are to be published later.

Dr. James M. Hayes reported an interesting case of Intussusception Anti- and Isoperistaltic, with Case History by Dr. L. F. Richdorf (By Invitation). This Case Report is to be published.

Dr. Hayes: As Dr. Richdorf has said, we have not been able to find a case just like this reported in literature. Many cases of a double intussusception have been reported, but all have been in the same direction.

In this case the ileum and cecum were drawn into the ascending and transverse colon to about the mid-portion of the transverse colon, where there was a definite obstruction caused by a loop of jejunum. In the opposite direction, or antiperistaltic, the descending and transverse colon passed into the transverse colon almost to this point of obstruction.

The vacuum created by the obstructing loop of jejunum may be the cause of the antiperistaltic intussusception.

We made a diagnosis of intussusception before the operation. Practically all the cardinal signs and symptoms were present. We expected the isoperistaltic condition, but had not thought of a double intussusception. The one

felt like a sausage and extended from the direction of the hepatic flexure below the umbilicus almost down to the sigmoid. It was very hard and was drawn tight against the posterior peritoneum. The other was not so long but very firm and fixed, extended from the mid-transverse colon to a point about midway between the umbilicus and the splenic flexure.

The loop of jejunum passing around the transverse colon and obstructing it appeared almost gangrenous before being released. When released it regained normal color rapidly.

An attempt was first made to draw the lower mass up through a small right rectus incision, but it was so thoroughly fixed that the incision had to be enlarged upward. When the incision was extended upward, the loop of jejunum immediately released and this mass was readily brought up and the intussusception reduced.

A second mass was then palpated high up. This was also quite readily brought up into the wound and reduced.

There was considerable swelling and edema present, and the intestines appeared dark in color before reduction, but readily regained normal appearance.

The entire colon was very mobile. The cecum and ascending colon were secured by a few silk sutures to the posterior and lateral parietal peritoneum.

The child made a very satisfactory recovery.

#### DISCUSSION

DR. WILLARD D. WHITE: The only thing that Dr. Hayes did not bring out that I would like to add is that reduction is accomplished most easily by milking the small intestine out from the large rather than by pulling on the small intestine in an ileocecal intussusception. In other words, the intussusceptum is expressed or milked out from the intussusciens. Traction is not made on the invaginated intestine.

By all means some measure should be adopted to prevent recurrence and, as mentioned, the most common way is to plicate the mesentery of the ileum and attach the cecum to the lateral wall so that mobility of the cecum is lessened.

DR. L. F. RICHDORF: It seems to me that surgeons have something to do in regard to the recurrence of

intussusception after operation. In the case that Kato reported the prolapsus intussusciens recurred afterward, with a fatal outcome. Possibly if something had been done to hold the colon in place the recurrence of the condition could have been avoided and the child's life saved.

DR. H. BRIGHT DORNBLASER: Dr. Richdorf mentioned something protruding from the rectum. What did that prove to be?

DR. RICHDORF: The mass referred to was seen on simple inspection. The sphincter was relaxed and the mass was visible and palpable about two inches above the anal opening. Apparently this was the same mass palpated on the right side and protruding into the pelvis. Succeeding events at and after operation presented no other explanation. The finding of the mass of course hastened the decision for surgical interference.

DR. JAMES KERR ANDERSON: I wonder if this was a condition of intussusception protruding from the rectum. Of course we see a lot of rectal prolapses. I don't know whether that might be a prolapse or whether it was this intussusception on the right side.

Just recently we had a little child sent up from down in the southern part of the state by a doctor who thought the child belonged in our service, and when she came up she was very ill and was immediately turned over to a pediatrician, because we realized it was not in the rectum or large bowel. She was operated and had an intussusception, but the thing had existed about four days, and the child died.

The meeting adjourned.

H. BRIGHT DORNBLASER, M. D.,  
Secretary.

## VIABILITY OF *B. DIPHThERIAE* AND *STAPHYLOCOCCUS AUREUS* ON A KNIFE BLADE

(Continued from Page 356)

the deduction being that they were transmitted by the knife, although the blade of the knife did not show this organism on culturing.

2. The maximum viability limit of *B. diphtheriae* on a knife blade under ordinary conditions was established as eighty-six days.

3. The viability of *Staphylococci aureus* under similar conditions was unaffected for eighty-six days.

#### CONCLUSION

1. It may be advisable to consider the bacteriological examination of knife blades used in stabbing affairs.

#### BIBLIOGRAPHY

1. Sternberg, *Manual Bac.*, p. 455.



South Dakota State Medical Association

Watertown, South Dakota

**TENTATIVE PROGRAM**

June 20, 21, 22, 1932

Monday, June 20th

2:00 P. M. House of Delegates. Lincoln Hotel. (Officers, Councilors and Delegates.)

8:00 P. M. Council. Lincoln Hotel.

**SCIENTIFIC PROGRAM**

Old Metropolitan Theatre

Tuesday, June 21st

9:00 A. M. Medical Clinic. W. W. Duke, M.D., Kansas City, Mo.

10:30 A. M. Surgical Clinic. H. M. Richter, M.D. Chicago, Ill.

Noon

2:00 P. M. Papers.

1. "The Dawn of a Specialty in Medicine—Allergy." W. W. Duke, M.D., Kansas City, Mo. Discussion opened by J. L. Calene, M.D., Aberdeen.

2. "The Surgical Treatment of Peptic Ulcer." H. M. Richter, M.D., Chicago, Ill. Discussion opened by Percy D. Peabody, M.D., Webster.

3. "Roentgen Diagnosis in Preventive Medicine." Leo G. Rigler, M.D., Minneapolis, Minn. Discussion opened by A. A. McLaurin, M.D., Pierre.

4. "The Functional Basis of Certain Kidney Diseases with Brief Consideration of the Pathology of the More Common Kidney Lesions." J. C. Ohlmacher, M.D., Vermilion. Discussion opened by R. J. Jackson, M.D., Rapid City.

7:00 P. M. Association Dinner. Lincoln Hotel. Toastmaster, W. G. Magee, M.D., Watertown. Address of Welcome, James H. Lockwood, M.D., Henry, President Watertown District Medical Society.

The State Association. Willard Allen Bates, Aberdeen, President South Dakota State Medical Association.

Your Medical School. Dean A. G. Pohlman, University of South Dakota.

Address. President Herman James, University of South Dakota.

Wednesday, June 22nd

9:00 A. M. Gynecological Clinic. Charles W. Pollard, M.D., Omaha, Neb.

10:30 A. M. Pediatric Clinic. J. E. Gonce, M.D., Madison, Wis.

Noon

2:00 P. M. Papers.

1. Obstetrics. Charles W. Pollard, M.D., Omaha, Neb.

Discussion opened by E. A. Pitteuger, M.D., Aberdeen.

2. Infantile Paralysis Diagnosis and Treatment. J. E. Gonce, M.D., Madison, Wis. Discussion opened by W. E. Donahoe, M.D., Sioux Falls.

3. Mental Deficiency. F. V. Willhite, M.D., Redfield.

Discussion opened by J. C. Shirley, M.D., Huron.

4. Spinal Anesthesia. Owen King, M.D., Aberdeen.

Discussion opened by B. A. Bobb, M.D., Mitchell.

Scientific Exhibits.

X-Ray Films.

Committee: A. A. McLaurin, M.D., Pierre; N. J. Nessa, M.D., Sioux Falls.

No registration fee at this meeting. Your membership card admits you to all meetings.

**TENTATIVE PROGRAM**

of the

**SOUTH DAKOTA ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY**

in

Watertown—June 21st, 1932

at Lincoln Hotel

N. N. Grosvenor, M.D., President, Huron

H. L. Saylor, M.D., Secretary, Huron

10:00 A. M. "Some Experiences in Bronchoscopy." Kenneth A. Phelps, M.D., Minneapolis, Minn.

11:00 A. M. "Local Anesthesia." J. F. Parsons, M.D., Crookston, Minn.

Noon

2:00 P. M. "Incidence of Focal Infection in Acute Sinus Diseases and Treatment." Frederick H. Roost, M.D., Sioux City, Iowa.

3:00 P. M. "Acute Mastoiditis of the Haemolytic Streptococic Type." C. E. Robbins, M.D., Pierre.

**WOMAN'S AUXILIARY**

1910-1932

Watertown, June 21, 22, 1932

Officers

Mrs. T. J. Billion, President.....Sioux Falls

Mrs. N. K. Hopkins, President-Elect.....Arlington

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Mrs. J. C. Ohlmacher, Second Vice-President....

.....Vermilion

Mrs. Geo. H. Gulbrandsen, Secretary-Treasurer...

.....Brookings

## PROGRAM

## Tuesday, June 21st

- 9:30 A. M. Registration. Hotel Lincoln.  
 10:00 A. M. Meeting. Hotel Lincoln.  
 2:30 P. M. Bridge Tea. Watertown Golf Club, Lake  
 Kampeska. (Cars leave Hotel Lincoln at  
 1:30 P. M.)  
 7:30 P. M. Association Dinner. Hotel Lincoln.

## Wednesday, June 22nd

- 10:00 A. M. Meeting.  
 1:00 P. M. Luncheon.

## Local Committee

Auxiliary of the  
Watertown District Medical Society

Mrs. W. G. Magee, General Chairman.....	Watertown
Mrs. H. J. Bartron, Reception.....	Watertown
Mrs. G. H. Richards, Transportation.....	Watertown
Mrs. A. J. Pankow, Transportation.....	Watertown
Mrs. M. J. Hammond, Transportation.....	Watertown
Mrs. R. F. Campbell, Bridge Tea.....	Watertown
Mrs. F. Koren, Bridge Tea.....	Watertown
Mrs. R. H. Brown, Luncheon.....	Watertown
Mrs. A. E. Johnson, Luncheon.....	Watertown
Mrs. William Duncan, Luncheon.....	Watertown

## NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Dr. G. J. Hanley, formerly in practice at Twin Valley, is now located at Truman, Minn.

Dr. and Mrs. Hugh S. Cabot, Rochester, Minn., have recently returned from a six weeks' trip in Europe.

Dr. O. A. Olson, Minneapolis, will spend several months in Europe this summer in study at the leading medical clinics.

Dr. Sidney Storris, who was a practicing physician in Minneapolis for over 57 years, died last month at the age of 88 years.

Dr. C. R. Senescall has purchased the interests of his partner, Dr. F. H. Wiechman, and will continue his general practice at Sleepy Eye, Minn.

Dr. Owen King, Aberdeen, has been named Railroad physician of the Minn. and St. Louis Railway to succeed the late Dr. M. C. Johnson.

Dr. A. R. Barnes of the Mayo Clinic was the guest speaker at the spring meeting of the members of the Yellowstone Medical Society at Billings.

Dr. W. M. Copenhaver, one of the prominent physicians of Helena, was drowned last month while on a fishing trip with a party of personal friends.

Dr. S. A. Slater, Worthington, Minn., was in Richmond, Va., last month, where he attended the celebration of his alma mater at Richmond University.

Dr. Paul G. Bunker, a specialist recently on the staff of the Miller Clinic, St. Paul, is now associated as a partner, with Dr. M. G. Milan, Aberdeen, S. D.

Dr. Glenn Toomey has become an associate of Dr. W. F. Sihler at the General Hospital, Devils Lake, N. D. Dr. Toomey is a recent graduate of the Rush Medical College.

The annual meeting of the Southeastern Minnesota Medical Society will be held at Rochester, on Sept. 12th. Dr. C. C. Allen, Austin, president, and Dr. M. C. Piper, Rochester, secretary.

Dr. A. C. Clark, a prominent physician of Woonsocket, S. D., died on April 26th, the result of an operation for gall bladder trouble. Dr. Clark had been in active practice in that city for nearly 20 years.

The regular meeting of the Northwest District Medical Society was held at Trinity Hospital, Minot, on April 28th. A fine dinner was served, followed by a discussion on topics of interest to all members present.

Dr. Cecil Moriarty, of the University of Minnesota, was the guest speaker at the May meeting of the Sioux Falls District Medical Society. He presented a paper on "Surgical Diagnosis in Infancy and Childhood."

Dr. F. H. Allen died at his home in Staples, Minn., after an illness of many months from heart trouble. Dr. Allen was a graduate of Rush Medical College, and had been in active practice at Staples for the past 30 years.

Dr. James F. Kline, founder of Kline's Sanitarium, died on May 19th, at his home in Anoka, Minn., at the age of 70 years. Dr. Kline graduated at the University of Minnesota in 1893 and had been in active practice in Anoka during these years.

Mrs. James Blake, Hopkins, Minn., was chosen president-elect of the Woman's auxiliary of the American Medical Association at the annual convention held in New Orleans. She is now serving as president of the Wom-

an's auxiliary to the Minnesota State Medical Association.

Dr. John Wesley Andrews, one of Mankato's most prominent physicians, passed away at his home on May 16th at the age of 83 years. Death was caused by a blood disease. Dr. Andrews practiced medicine for 55 years, 47 of them in Mankato, Minn.

The American Medical Association awarded bronze medals to Drs. J. A. Bargen, P. W. Brown and H. M. Weber of the Mayo clinic and the Mayo foundation for investigation of diseases of the colon. Silver medals went to L. G. Rowntree, and C. H. Greane of the Mayo clinic, for research in Addison's disease.

The Minnesota Academy of Medicine held its May meeting at the Town and Country Club on May 18. After dinner was served, the following program was presented: Thesis—"Therapeutic Considerations in the Management of Acute Intestinal Obstruction" by Dr. Owen H. Wangenstein. Case Reports—"Meckel's Diverticulum Causing Bowel Obstruction, by Dr. James A. Johnson. "Meckel's Diverticulum Perforation by Fishbone," by Dr. Arch A. Wilcox.

Dr. Erling W. Hansen was named president of the Hennepin County Medical Society, to take office Oct. 1, at the annual election of officers held at the society's clubrooms in the Medical Arts Building. He will succeed Dr. Moses Barron. Other officers are Dr. P. A. Stewart, first vice president; Dr. R. R. Cramer, second vice president; Dr. A. J. Campbell, secretary and treasurer; and Dr. A. S. Hamilton, librarian. Dr. Olga S. Hansen and Dr. Leo Rigler were elected on the ethics committee, and Dr. A. E. Hedback and Dr. T. A. Peppard to the board of trustees.

The Minnesota State Medical Association Broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters). Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month of June will be as follows: June 1st—Personal Hygiene—Right Thinking. June 8th—Pilonidal cyst. June 15th—Congenital Cataracts. June 22nd—The Nature of Scabies. June 29th—Do Moles ever become Cancerous?

Dr. Leo M. Crafts, Minneapolis, has recently received the formal invitation of the Neurological Society of Paris, to attend the Annual International Neurological Reunion, at Paris in June; and to become a contributor to the scientific material presented and to the discussions of the meetings. This is an international gathering of neurologists, sponsored annually by the Paris Society, including mostly men from the adjoining countries of the continent and Great Britain; with a limited number especially selected from the United States. The reunion was omitted last year in deference to the convening of the International Neurological Congress held at Berne, Switzerland, in September, to which Dr. Crafts was named as a delegate.

The North Dakota State Board of Medical Examiners, of which Dr. G. M. Williamson is administrative officer, reports the work of their organization concerning the status of osteopathic physicians insofar as their registration under the terms of the Harrison Narcotic law, as amended, are concerned. In a letter to Dr. Williamson, from O. A. H. deLa Gardie, District Supervisor of the U. S. Narcotic Service, he says in part: "There are nine osteopaths so registered in the State of North Dakota, each of whom is on this date being directed to surrender his special tax stamp and unused official opium order forms and to make legal disposition of whatever narcotic drugs he may have on hand. In the event any of them fail to comply with our demand in this connection, you will be duly advised, and on the other hand, this office will inform you when the registrations of these persons have been cancelled." The North Dakota State Board of Medical Examiners are to be congratulated on the splendid work they are doing in properly licensing the osteopathic physicians of their state.

On May 9, 1932, George Schuster, 54 years of age, entered a plea of guilty to practicing healing without a Basic Science Certificate in Minneapolis, and was sentenced to pay a fine of \$100.00. After being admonished by the Court to cease practicing healing at once and to refrain from it in the future, the defendant paid the fine. The Court also informed counsel for the defendant that a second violation of the Medical Laws of this State would undoubtedly result in a trip to the Minneapolis Work House for the defendant. Schuster's illegal practice of healing in this state came to light following his making complaint in Chicago. Schuster claims to have been ordained a

German Lutheran Minister in 1909, at Pittsburgh, Pa. He also claims to be a member of the Naturopathic Association, and he appears in a picture of the delegates to the National Naturopathic Convention held in Milwaukee, Wis. Schuster's place of business in Minneapolis was at 4256 Park Ave. Schuster admitted that he had been twice previously convicted of practicing medicine without a license; in 1921 at Youngstown, Ohio, and in 1928, at Chicago.

Some medical advertisements broadcast by WRHM, Twin Cities radio station, have been criticized by Dr. Moses Barron, president of the Hennepin County Medical Society, who is one of twelve persons who have filed depositions to aid the University of Minnesota in its fight to share a channel with WRHM. The Twin Cities station recently petitioned the Federal Radio Commission for exclusive use of the 1,250-kilocycle channel, now shared with WLB, university station. The university was joined by two other educational institutions who use the same channel—Carleton and St. Olaf colleges in Northfield, which operate KFMX and WCAL respectively.

Dr. N. O. Pearce, Minneapolis, was elected president of the Minnesota State Medical Association at the seventy-ninth annual meeting in St. Paul. Dr. Pearce was president of the Hennepin County Medical Society in 1929. Other officers named are Dr. William A. Piper, Mountain Lake, first vice-president; Dr. F. R. Huxley, Faribault, second vice-president; Dr. E. A. Meyerding, St. Paul, re-elected executive secretary, and Dr. W. H. Condit, Minneapolis, re-elected treasurer. Dr. Herman M. Johnson, Dawson, and Dr. William F. Braasch, Rochester, were named delegates to the meeting of the American Medical Association in Milwaukee next May. Councillors elected are Dr. J. M. Hayes, Minneapolis; Dr. L. Sogge, Windom; Dr. William A. Coventry, Duluth, and Dr. Herbert Z. Giffin, Rochester. Dr. Hayes was elected to finish the term of Dr. Pearce.

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## Fall Hay Fever in the Upper Mississippi Valley with Special Reference to Minnesota and the Dakotas

RALPH V. ELLIS, M.D.\* and C. O. ROSENDAHL, Ph.D.†  
*Minneapolis*

**S**UCCESSFUL specific treatment of hay fever is not possible without accurate knowledge concerning the occurrence, the distribution, and the pollinating season of the hay fever causing plants in the environment of the patient to receive the treatment. One of us (\*) confronted with the responsibility of recommending correct specific treatment to hay fever sufferers among the students at the University of Minnesota was at once handicapped by the lack of this knowledge. A search of the literature revealed that no survey of the hay fever plants had been published for this region. Several surveys have been made in various parts of the United States and while the data compiled from a survey of one locality is useful by way of comparison with the data compiled from a survey in another locality, the conclusions drawn concerning one locality cannot be transferred without careful examination to another.

Upon seeking the aid of the Botany Department of the University one of us (\*) learned that the other (†) had for some time been getting together the needed facts. Together we have attempted to arrive at some conclusions concerning the causes of hay fever in this region.

While the present report is only preliminary we believe that our study has produced important

\*From the Dept. of Prev. Med. and Pub. Health and Students' Health Service.

†From the Dept. of Botany, University of Minnesota.

Presented before the Medical Staff of the Lymanhurst School for Tuberculous Children, May 31, 1932.

facts which should, without delay, be brought to the attention of those who are called upon to administer the specific treatment for hay fever.

This report is based upon clinical, herbarium, and field studies. In the herbarium each species involved is represented by many specimens on each of which is noted the time and place of collection. These were studied to note the earliest dates on which well developed anthers were found and the dates after which anthers had failed to ripen. Field studies in the natural habitat showed the time at which anthers ripened and pollen was produced as well as the occurrence and distribution of the plants.

From the clinical standpoint our conclusions are based upon the history and sensitization tests of 100 cases of fall hay fever seen at the Health Service of the University of Minnesota. While the majority of these live in Minnesota, many are residents of adjacent states. In taking the history of these cases we were impressed by the fact that a considerable number had been treated with ragweed pollen extract with no benefit. Furthermore, our records show that of the 100 cases of fall hay fever only 81 were sensitive to ragweed and related species by the scratch test. Those giving negative tests to the Ambrosiaceae (ragweed group) were rechecked by the intradermal and intranasal tests without changing the results. From these results it seemed apparent that pollens from some other plants must be re-

sponsible for a considerable amount of fall hay fever in this region.

One of us† without clinical substantiation but with intimate knowledge of the flora of the region has long felt that the *Artemesiae* (Wormwood-Sage group) has not been given the attention in this region that its occurrence and distribution merits.

Scheppegrell<sup>1</sup> in discussing hay fever pollens states: "The hay fever east of Kansas is caused by the common ragweed, this being replaced in moist regions by the giant ragweed." Marsh elder and cocklebur he mentions as minor causes. Quoting further from Scheppegrell, "In the Pacific and Rocky Mountain states the ragweeds are replaced by the wormwoods (*Artemesiae*), the rough bur elder, the Gaertnerias, and Western ragweed. There are also various degrees of reaction among the hay fever pollens, the most active that we have tested are the wormwoods. The pollen of these will cause a reaction ten times more severe than the common ragweed. Next to the wormwood we have found the ragweeds most active." Our own experience corroborates the statement of Scheppegrell that the wormwood pollen produces more severe skin reactions than do the ragweed pollens when applied in the same strength.

In Table 2 it will be seen that the pollinating periods of the wormwoods and ragweeds are very much the same. It is evident therefore that when the wormwoods are present it is unwise to conclude that the hay fever symptoms of a given patient are due entirely to the ragweed and related species because he gives positive skin reactions to these unless by the same methods he is found non-sensitive to the wormwood group.

To discover the relative importance of these two groups as indicated by the number of sensitized individuals 100 cases of fall hay fever were tested with the pollens of the wormwood and ragweed groups. In our experience a person who is sensitive to one of these groups usually reacts in some degree to practically all members of the same group. The information concerning the overlapping of sensitivity reactions within the group is not sufficiently concise to warrant discussion here. Multiple sensitization involving reaction to both groups is however probably specific and not due to overlapping of immunological relationships between the two groups. Although the majority of cases tested are sensitive to both groups, many are found who are highly sensitive

to one and entirely negative to the other when solutions of high concentration (.1 mg. N. per cc.) are injected intradermally. The results of these tests involving the two groups under discussion are summarized in the following table:

TABLE 1

No. Cases	POSITIVE SKIN TESTS					
	To: Ragweed	Wormwood	Both	Neither	Ragweed Only	Wormwood Only
100	81	76	68	11	13	8

The skin tests correlated with the pollinating periods of the various plants which make up the flora of a given region is the accepted basis for the determination of what pollen extracts to use in the specific treatment of a patient. Basing conclusions upon these tests we should expect only 13 per cent of fall hay fever cases to receive 100 per cent relief even when treated with adequate doses of ragweed pollen extract and that 68 per cent would be partially relieved by the same treatment. Eight per cent should receive 100 per cent relief by treatment with an adequate amount of the extract of wormwood pollen extract and 68 per cent should be to some extent benefited. A combination of the extracts of the pollens of the most important members of the two groups should bring relief to the 68 per cent having multiple sensitivity. This point is being tested this season with a series of cases, several of which have been previously treated with the extract of ragweed with little or no benefit.

A complete diagnosis of the causes of hay fever has another importance not always appreciated. Every physician encounters some cases of hay fever for whom by reason of some other ailment the specific treatment is not advisable. Others are seen who prefer not to take the risks and punishment attendant upon desensitization treatment. A complete diagnosis of the causes of the patient's condition and a knowledge of the distribution of the plants producing the causative pollens will enable the physician to render a valuable service by directing the patient to a region where he may take a much-needed vacation in perfect comfort during the period that he is doomed to illness in his usual environment. It is nothing short of empiricism to send a patient to a hay fever resort without a knowledge of these essential facts.

It seems to the authors that the results of our clinical studies indicate an importance of the *Ragweed-Wormwood* group of plants in the causation of autumn hay fever in the upper Mississippi Valley calling for fuller and more readily available information regarding both the exact geographical ranges of the various species as

1. The Seasons, Causes, and Geographical Distribution of Hay Fever, U. S. P. H. Reports Reprint No. 610, Sept. 24, 1920.

well as the time and duration of their pollinating periods. The term "Ragweed-Wormwood group" is here used broadly and it is important to enumerate the species that make up the group for the region under consideration. Furthermore the relative importance of each species, so far as it can be judged by frequency of occurrence and widespread distribution, together with amount of pollen production, need to be considered. It is undoubtedly correct to assume that three or four species of the group are chiefly responsible for autumn hay fever. On the other hand, recent observations of the authors show clearly that many cases of hay fever occurring in late summer and fall show no reaction to the customary dermal tests for ragweed, but react very strongly to the pollens of various species of *Artemisia*. It is only in regions where the Sagebrush—*Artemisia tridentata*—occurs in abundance and is known to be the cause of hay fever in some persons that the *Artemisiae* group has received any consideration from the practitioner. Conversely where the Sagebrush does not occur the group as a whole has been generally neglected as of little or no importance. Since our studies indicate that other *Artemisia* species than *tridentata* are a factor in a number of cases it is deemed desirable to present in this paper the fullest data that it has been possible to assemble on the geographical distribution and time of pollination of all the species of the genus which occur in the upper Mississippi Valley. The data for Minnesota is fairly complete and reliable, but unfortunately this cannot be said for the Dakotas. In the first place neither of the authors has had opportunity to make any direct field observations in either state. In the second place there is far less material on hand in the university herbarium on which to base reports than from Minnesota and in the third place the published records on the occurrence and distribution of species are relatively few. Our report as it applies to North and South Dakota must therefore be regarded as tentative and subject to considerable revision as more facts become available. It is regrettable that this is so. Nevertheless it is hoped that what we are presenting will prove of material aid to the practicing physicians residing in the area under consideration.

It is necessary to call attention to the fact that although the dates given for the pollination periods are based upon field records kept over a number of years and supplemented by a careful study of all available herbarium material, there is sure to be some variation from the dates assigned due to differences in seasons. Further-

more some allowance must be made for the possibility of somewhat earlier blooming in the western part of the area and the lack of personally kept records there. In general, however, the maximum of pollen production is pretty sure to occur within the limits of the dates given. Since the list of species under consideration is not unduly long, a simple alphabetical arrangement according to their botanical names should prove adequate for consultation.

TABLE 2

SPECIES COMPOSING THE RAGWEED-WORMWOOD (SAGE) GROUP IN MINNESOTA, NORTH AND SOUTH DAKOTA		
Ambrosiaceae	Common Name	Dates
<i>Ambrosia artemisiifolia</i>	Common Ragweed	Aug. 10-Oct. 15
<i>Ambrosia bidentata</i>	Lance-leaved Ragweed	Aug. 5-Sept. 15
<i>Ambrosia psilostachya</i>	Western Ragweed	Aug. 8-Sept. 15
<i>Ambrosia trifida</i>	Giant Ragweed	Aug. 5-Sept. 15
<i>Franseria acanthicarpa</i>	False Ragweed	Aug. 10-Sept. 15
<i>Iva axillaris</i>	Marsh Elder	June 5-July 20
<i>Iva xanthifolia</i>	Marsh Elder	Aug. 10-Oct. 1
<i>Xanthium canadense</i>	Cocklebur	Aug. 15-Oct. 10
<i>Xanthium echinatum</i>	Beach Clothbur	Aug. 10-Oct. 1 (?)
<i>Xanthium speciosum</i>	Great Clothbur	Aug. 5-Oct. 1 (?)
Artemisaceae		
<i>Artemisia abrotanum</i>	Southernwood	Aug. 1-Sept. 15
<i>Artemisia absinthium</i>	Absinth	Aug. 1-Sept. 10
<i>Artemisia biennis</i>	Biennial Wormwood	Aug. 10-Oct. 1
<i>Artemisia cana</i>	Hoary Sage	Aug. 20-Sept. 30
<i>Artemisia canadensis</i>	Canada Wormwood	Aug. 15-Oct. 10
<i>Artemisia caudata</i>	Wild Wormwood	Aug. 1-Sept. 10
<i>Artemisia dracunculoides</i>	Dragon Sage	Aug. 5-Sept. 15
<i>Artemisia frigida</i>	Pasture Sage-Brush	Aug. 5-Sept. 20
<i>Artemisia ludoviciana</i>	Prairie Sage	Aug. 5-Sept. 20
<i>Artemisia longifolia</i>	Long-leaved Wormwood	Aug. 1-Sept. 1
<i>Artemisia serrata</i>	Saw-leaf Wormwood	Aug. 10-Sept. 15
<i>Artemisia tridentata</i>	Sage Brush	Aug. 20-Oct. 1
<i>Artemisia vulgaris</i>	Common Mugwort	July 20-Sept. 1

#### *Ambrosia artemisiifolia*. Common Ragweed.

A pernicious weed along roadsides, streets and alleys, in fields and vacant lots. Very common throughout the southern and western parts of Minnesota, less frequent as far north as Two Harbors and thence northwestward to Leech Lake, Cass Lake and westward to Lake of the Woods. Abundant in the Red River Valley and westward to the Missouri Valley in North Dakota. Throughout South Dakota, but becoming infrequent in the western part, especially in the Black Hills. The common Ragweed is the most frequent cause of autumn hay fever in the area under consideration, partly because of its widespread distribution and great abundance in centers of population and partly on account of the great quantity of pollen production.

#### *Ambrosia bidentata*. Lance-leaved Ragweed.

This is essentially a species of the southern plains, but is known to occur in a few places in southern Minnesota. We have no records of it in North and South Dakota and it is safe to consider it as of only local interest and of no general importance.

#### *Ambrosia psilostachya*. Western Ragweed.

This species occurs mostly on sandy soil in fields, pastures and open situations and occasionally in openings in the northern coniferous forest. Fairly common in the lighter soils throughout both the Dakotas and in southern and western Minnesota, also found

in scattered localities eastward and northeastward as far as Cook county and Isle Royale in Lake Superior. This species enjoys the widest distribution of all the Ambrosias of the area treated and since it is found here and there in patches in the northern evergreen forest, it is liable to be the source of trouble to hay fever patients who seek the north woods for relief. Additional field work for the purpose of locating definitely and mapping these outposts of the Western Ragweed is much needed.

*Ambrosia trifida*. Giant Ragweed.

Occurs mostly in rich and moist soil, in fields, bottomlands, along roadsides and waste places. It is very common in the southeastern, southern and western parts of Minnesota northward to Washington county and thence northwestward to the Red River Valley. Less frequent and local along the eastern border as far as Duluth and in the east central area. Frequent in both North and South Dakota east of the Missouri Valley and locally westward to the Bad Lands and the Black Hills.

The pollen production of the Giant Ragweed is greater per plant than that of the other species and where it occurs in abundance it is a very serious factor in hay fever causation. Its blossoming season, however, is shorter than that of the Common Ragweed and, in most localities of the area, it is through blooming before the onset of frost.

*Frauseria acautbicarpa* (Goertmira). False Ragweed.

A western species, mostly of moist, sandy soils, occurring in widespread localities of the two Dakotas and sporadically as far east as Ramsey county, Minnesota. It is of minor significance in our area, but should not be entirely overlooked.

*Iva axillaris*. Marsh Elder, Salt Sage.

A plant of alkaline or saline meadows and low ground. Frequent throughout the western halves of both North and South Dakota, less common eastward as far as Valley City, North Dakota and absent from Minnesota. This species is the earliest blooming of the entire group and in the southern part of the area begins to shed pollen by the end of the first week in June.

*Iva Xanthifolia*. Marsh Elder, Careless Weed.

Grows in a variety of situations, but more often in moist or alluvial soils. It occurs throughout the Dakotas, most abundantly east of the Missouri River, and in all of Minnesota except the northeastern evergreen forest area. In some localities the plant grows in great profusion and in pollen production it ranks next to the ragweeds. For these reasons the Marsh Elder should be given more consideration that it seems to have been accorded hitherto.

*Xanthium canadense*, *Xanthium echinatum*, *Xanthium speciosum*. Cocklebur, Clotbur.

The three species are considered together, partly

because they are difficult to differentiate taxonomically and partly because the records regarding distribution are fragmentary. The Cockleburs are plants mostly of low moist places, either sandy lake shores or alluvial bottomlands, fields and waste places. They are fairly frequent east of the Missouri Valley in the Dakotas, but rare westward. In Minnesota they are locally common throughout the southern half of the state and northwestward, especially in the lake region, towards the Red River Valley. The pollen production of the Cocklebur is scanty compared with the ragweeds, but it is likely to be troublesome locally to people frequenting lake shores, beaches and river banks.

THE ARTEMISEAE

This group is represented by a considerable number of species both native and naturalized or cultivated garden forms. We are inclined to regard all as potential hay fever plants yet possibly only seven or eight of the cited species play an important part in hay fever causation. These are the ones which in addition to being widely distributed geographically also grow in great abundance, often near centers of population and are capable of considerable pollen production. The three introduced species *Artemisia abrotanum*, *A. absinthium* and *A. vulgaris*, have become naturalized to some extent in Minnesota and the eastern parts of the Dakotas. Furthermore they are not infrequently grown as ornamentals, the first named as a hedge plant, and for this reason patients are liable to come in very close contact with them.

*Artemisia cana*, *A. longifolia* and *A. tridentata* are species principally of western North and South Dakota, but the first named occurs infrequently eastward in North Dakota towards the northeastern corner. None of them come within the borders of Minnesota. Of these three, the Sage Brush (*A. tridentata*) has an unenviable reputation as a hay fever plant and only the fact that it is mainly confined to the thinly populated portions of our two neighboring states reduces its importance from our standpoint.

The remaining seven species of our list constitute the great bulk of the *Artemisia* population in the middle northwest and the available data on their distribution will be presented.

*Artemisia biennis*. Biennial Wormwood.

This species is found on sandy soils, gravelly banks and dry situations generally. It is frequent in the north central and eastern parts of North Dakota and eastward from the Missouri River in South Dakota. It appears to be extending its range eastward and occurs in Minnesota from Kittson county in the northwest to Winona county in the southeast, being most abundant in the west central portions of the state. We have found it blooming as late as early October in Minneapolis.

*Artemisia canadensis*. Canada Wormwood.

A northern species, growing mostly in rocky situations and entering our area only along the northern

border. It is, therefore, of considerable local importance since northern Minnesota is generally regarded as a safe haven for hay fever sufferers. Fortunately its occurrence is infrequent and scattering.

*Artemisia caudata*. Wild Wormwood.

Grows in sandy soil, especially on dry slopes and sandy outwash plains. It is fairly common throughout North and South Dakota and abundant in most parts of Minnesota except the northeastern corner. It is rampant on the sandy areas around the Twin Cities and flourishes on vacant lots and banks within the city limits. This and the following species are the commonest and most widespread of our Artemisias.

*Artemisia dracunculoides*. Dragon Sage.

Grows in similar situations as the preceding and has essentially the same geographical range. Its pollen production is less on account of the smaller heads and fewer flowers and because it grows more scattered and in less dense stands than the former.

*Artemisia frigida*. Pasture Sage Brush.

A shrubby species of dry gravelly soils of the plains, buttes and river bluffs. It is common throughout North and South Dakota, western, southern and southeastern Minnesota, but absent from the coniferous forest area of the northeastern part of the state. On some of the bluffs of both the Minnesota and Mississippi Rivers it grows in extensive stands, giving a uniform gray appearance to the slopes.

*Artemisia ludoviciana*. Prairie Sage.

Grows mostly in more or less extensive patches on the plains, dry prairies, banks and slopes throughout North and South Dakota and Minnesota except in the evergreen forest north of Lake Superior. It flowers less profusely than the three preceding species and its pollen production is correspondingly smaller. It is the most easily recognized of all the species on account of its slight gray or whitish foliage.

*Artemisia serrata*. Saw-leaf Sage.

A plant mostly of low grounds, moist depressions, river and stream valleys. It occurs in eastern South Dakota and southern Minnesota as far north as Taylors Falls, thence westward to Mille Lacs and Otter Tail counties. The species is probably of only local importance, but it blossoms fairly freely and in this immediate vicinity at least merits consideration.

While the Ragweed-Wormwood group plays the chief part in the causation of autumn hay fever in this area the fact must not be lost sight of that there are a number of recurrent and late-blooming species from groups predominating earlier in the season which are likely to complicate the situation. Further study of these forms is much needed but since observations are available for eastern Minnesota on the principal ones under suspicion we feel justified in presenting the following partial list at this time:

<i>Digitaria humifusa</i>	Small Crab Grass	July 10-Sept. 15
<i>Muhlenbergia mexicana</i>	Satin Grass	Aug. 1-Sept. 10
<i>Phragmites communis</i>	Reed Grass	Aug. 1-Sept. 15
<i>Poa annua</i>	Low Spear Grass	May 25-Sept. 1
<i>Setaria italica</i>	Millet	Aug. 20-Sept. 20
<i>Zea Mays</i>	Corn	July 20-Aug. 20

*Digitaria humifusa*. Small Crab Grass.

Abundant in fields and especially in lawns during late summer and autumn. Common in the southern and central parts of Minnesota, eastern South Dakota and southeastern North Dakota.

*Muhlenbergia mexicana*. Satin Grass. Wood Grass.

Grows in meadows, fields, banks of streams, woods and thickets. Common and in places abundant throughout Minnesota except northeast and in the eastern parts of the Dakotas.

*Phragmites communis*. Reed Grass.

A tall grass on edges of ponds, shallow lakes, sloughs and river bottoms. It occurs in suitable localities practically throughout the entire area.

*Poa annua*. Low Spear Grass.

A low growing species of waste and cultivated ground and often in shaded situations in lawns and around dwellings. Common throughout most of Minnesota but there are no reliable records of its occurrence in the Dakotas.

*Setaria italica*. Millet, Hungarian Grass.

A cultivated species, usually sown late in June and blooming in the latter part of August.

*Zea Mays*. Maize or Indian Corn.

The common corn is a prolific pollen producer but the individual pollen grains are large and are said not to travel far. However where it is grown in gardens and near dwellings it is likely to be a source of disturbance.



# The Causes of Sudden Death; Analysis of Twenty-eight Cases\*

HARRY L. SMITH, M.D.

*Rochester, Minn.*

**I**N a consideration of this type, an explanation or definition of terms is necessary. What is meant by sudden death; is it death which takes place in a few minutes, a few hours, or a day? And what class of patients is to be considered; persons who have been perfectly well and die suddenly and unexpectedly, or persons who have been and are sick, and who die suddenly? If only those persons who have been perfectly well, and who die suddenly and unexpectedly are considered, the number of cases of any given series will be greatly reduced.

In this study, I have considered sudden death to mean death in a few minutes to a few hours. In all the cases considered, with the exception of three, death took place within six hours (table 2). I have considered persons who have been in fairly good health, and also persons who have been sick and who have died suddenly and unexpectedly. I have not considered cases of death by accident, suicide, or surgical complications.

## CAUSES OF DEATH IN GENERAL

The exact mechanism and physiology of death are not clearly understood. The trained pathologist can describe accurately some organic changes that are associated with death, but he is unable to explain the actual mechanism of the process. Often it is difficult to determine just the instant death takes place. All physicians are familiar with instances in which feeble cardiac tones are heard several minutes after the patient has stopped breathing; also, with instances in which the patient continued to breathe, when heart sounds could no longer be heard. There are on record instances of drowning in which patients have been submerged for thirty minutes but have been successfully resuscitated. As a rule, from a practical standpoint it is not difficult to determine when death takes place.

I think that too often the endeavor is made to ascribe death to failure of one organ or one system, when often, in reality, death is due to failure of more than one organ or system. All

are familiar with the often discussed question, in cases of pneumonia, did the patient die of respiratory or cardiac causes? The patient may not have had any significant heart trouble prior to the onset of pneumonia, but a few hours before he died, auricular fibrillation may have developed and the physician said, "Well, his heart failed." It is true that the patient's heart did fail, but so did all of the other organs. The point I wish to make in such instances is that the pneumonia is the primary cause of death and the patient did not die of cardiac failure.

## CAUSES OF SUDDEN DEATH

It is difficult to make a satisfactory classification of the causes of sudden death. The one given in table 1 is far from satisfactory, and many just criticisms can be made of it. It does, however, furnish a working basis, and includes the more common causes of sudden death.

In table 2, there is a summary of twenty-eight fairly sudden deaths in 1,172 consecutive cases in which necropsy was performed. In the twenty-eight cases, with four exceptions, death occurred in less than six hours after onset of the condition which immediately preceded death. In these instances, death did not occur until twelve hours after it had become apparently inevitable and in one case of epilepsy, the patient was found dead in his room, and it is impossible to state just how long he lived after the onset of his convulsion. Of the twenty-eight cases in which death was sudden, in thirteen (46 per cent) it was due to coronary thrombosis. These thirteen patients lived from a few minutes to five hours after the onset of severe attacks of pain. However, most of them died within a few minutes; one patient lived five hours after the attack, but the majority of patients in this group either died suddenly, or within a few minutes after the onset of the infarction.

There were five instances in which death was due to cerebral hemorrhage. These patients lived from one to twelve hours after the hemorrhage took place. The majority lived several hours, in contrast to those with coronary

\*Read before the Yankton District Medical Society, Vermilion, S. D., April 28, 1932.

thrombosis, who lived only a few minutes. The case in which hemorrhage occurred from a ruptured esophageal vein was included, because I have observed a similar case in which the patient died within twenty minutes after the onset of the hemorrhage.

#### CAUSES OF SUDDEN DEATH NOT REPRESENTED IN THIS SERIES

In table 2 are listed ten causes which produced the twenty-eight relatively sudden deaths. In table 1 appear many causes of sudden death, some of which occur fairly commonly, and some that are exceedingly rare. Eight of the causes of death listed under the cardiovascular system (table 2) were not represented among the 1,172 cases which form the basis of this paper.

Mesenteric thrombosis is not a common cause of sudden death, but it may produce death in a relatively short period of time. Fat embolism does not often cause death, but when it does, death usually occurs suddenly. Pulmonary hemorrhage is relatively common among tuberculosis patients, and among patients with chronic bronchiectasis, but it is responsible for a very low percentage of the mortality in these diseases. Death due to post-partum hemorrhage is relatively rare, but occasionally it does occur. Sudden deaths due to hemorrhage in cases of hemorrhagic purpura and hemophilia are extremely rare, but a few cases are reported in the literature. Spontaneous rupture of the myocardium is a cause of sudden death, but it is not a common occurrence. In a recent study, I, with Bartels, reported seven instances in 6,000 cases in which the patient came to necropsy. Of these seven patients, five died suddenly, one lived twenty-four hours after the onset of symptoms and one lived thirty-five hours after the rupture. Ventricular fibrillation is sometimes listed as a cause of death. Of course the diagnosis is only a clinical one, and no proof is obtainable at necropsy of such a cause. The sudden deaths that sometimes are associated with puncture of the various cavities of the body are not clearly understood. Several explanations are given for such deaths, but they are only conjectures. Anaphylaxis is a rare cause of death. Park found one instance of sudden death in 70,000 cases in which the patient had been treated with diphtheria antitoxin. Lamson found that 34 per cent of patients who died of anaphylaxis had had hay fever or asthma.

#### SO-CALLED STATUS LYMPHATICUS

In the past, death due to apparently trivial causes has often been explained on the basis of status lymphaticus. A committee appointed by the Medical Research Council and the Pathological Society of Great Britain and Ireland, after long study, came to the conclusion that there is no evidence of the existence of so-called status lymphaticus. Their report is in agreement with that of some other investigators. In the future status lymphaticus will probably not be accepted by reliable authorities for the cause of death.

#### ABSTRACTS OF CASES

CASE 1.—The patient was a man aged fifty-three years. A clinical diagnosis of syphilis of the central nervous system was made. Severe pain in the substernal region suddenly developed and the patient became very dyspneic, and somewhat cyanotic, and died in about ten minutes. Necropsy disclosed marked sclerosis of coronary arteries, with thrombosis and acute cardiac infarction.

CASE 2.—A man, aged forty-seven years, had a sudden, severe pain in the precordial region, and died in about twenty minutes. Necropsy disclosed severe coronary sclerosis, with occlusion of the anterior descending branch of the left coronary artery, and infarction of the left ventricle.

CASE 3.—A woman, aged sixty-six years, was receiving treatment for myxedema. For a few days she had had several attacks of precordial pain. One evening about 7 P. M. she had sudden, severe precordial pain, and died in a few minutes. Necropsy revealed acute infarction of the wall of the left ventricle, and atrophy of the thyroid gland.

CASE 4.—A man, aged fifty-four years, had a severe pain while sitting comfortably on a porch, and died within a few minutes. Necropsy disclosed acute infarction of the wall of the left ventricle.

CASE 5.—A man, aged sixty-nine years, had a severe pain in the substernal region at 2 A. M. and died in an hour and twenty minutes. Necropsy revealed severe coronary sclerosis, and dilatation of the left ventricle.

CASE 6.—A man, aged forty-six years, had syphilitic aortitis and was receiving antisyphilitic treatment. At 12:30 P. M. he had a severe pain in the substernal region. He gave a few gasps and died. At necropsy evidence of syphilitic aortitis was disclosed, as well as occlusion of the atria of the left coronary artery, with infarction of the wall of the left ventricle.

CASE 7.—A man, aged forty-nine years, had syphilitic aortitis, with aortic insufficiency. At

1:30 P. M. a severe precordial pain suddenly developed and the patient died in ten minutes. Necropsy disclosed syphilitic aortitis and coronary occlusion.

CASE 8.—A man, aged fifty-five years, was in a hospital and receiving treatment for coronary sclerosis and angina pectoris. At 4:50 P. M. a severe pain in the region of the heart suddenly developed and the patient died within a few minutes. At postmortem examination, coronary occlusion with myocardial infarction was revealed.

CASE 9.—A man, aged sixty-three years, had a severe pain in the region of the heart, became dyspneic and cyanotic, passed into a semicomatose state, and died in five hours. Necropsy disclosed coronary sclerosis with coronary occlusion and myocardial infarction.

CASE 10.—A woman, aged seventy-four years, was seen comfortably in bed. About half an hour later she was found dead in bed. Coronary occlusion with myocardial infarction was the cause found at postmortem examination.

CASE 11.—A man, aged fifty-one years, fell on the street and was immediately brought to a hospital, in a very cyanotic and dyspneic condition. He complained of a disagreeable feeling in the substernal region. He died one hour and twenty minutes later. Necropsy disclosed occlusion of the anterior descending branch of the left coronary artery and infarction of the left ventricle.

CASE 12.—A man, aged fifty-four years, had coronary sclerosis with cardiac infarction. While walking to the bathroom, he had a sudden pain in the substernal region, and died in a few minutes. At necropsy coronary thrombosis with cardiac infarction was found.

CASE 13.—A man, aged fifty-seven years, had coronary sclerosis with cardiac infarction. He died a few minutes after injection for local anesthesia of thoracic nerve roots one to seven. At necropsy, coronary thrombosis with cardiac infarction was found.

CASE 14.—A man, aged fifty-nine years, had moderate cardiac decompensation. Suddenly left hemiplegia developed and he died in six hours. Necropsy disclosed embolism of the right middle cerebral artery, with infarction of the brain.

CASE 15.—A man, aged fifty-seven years, suffered from arteriosclerosis affecting the general circulatory system and that part of it which supplies the central nervous system. He suddenly became unconscious and died in three hours. Necropsy disclosed hemorrhage in the left side of the cerebral cortex.

CASE 16.—A man, aged sixty-three years, suddenly became dizzy, felt faint, and paralysis of the right arm and leg developed. He died in twelve hours. At necropsy, hemorrhage of the left side of the cerebrum was found.

CASE 17.—A woman, aged thirty-three years, suffered from a cerebral accident. Signs of meningeal irritation developed, and she had one convulsion. The cerebrospinal fluid was bloody. She died in three hours. At necropsy, aneurysm of the basilar artery, with hemorrhage, was found.

CASE 18.—A man, aged fifty-six years, had bilateral, occlusive arterial disease. Suddenly severe headache developed, and he went into a state of shock. He passed into deep coma and died in five hours. At necropsy arteriosclerosis of the central nervous system, with cerebral hemorrhage, was found.

CASE 19.—A man, aged seventy years, had hypertrophy of the prostate gland due to malignancy. He had 150 c. c. of residual urine and was sent into hospital for decompression. He died very suddenly without any warning. At necropsy, pulmonary embolism was disclosed.

CASE 20.—A woman, aged twenty-three years, had malignant hypertension. She suddenly became unconscious, remained in this condition for about an hour and a half and died very suddenly. At necropsy, there was gross hemorrhage of the brain.

CASE 21.—A man, aged sixty-eight years, at 12:45 A. M., suddenly became unconscious. The upper and lower extremities were flaccid. He had marked stertorous breathing and died an hour and a half later. At necropsy, cerebellar hemorrhage, with rupture into the third and fourth ventricles, was found.

CASE 22.—A man, aged fifty-three years, entered the hospital with a diagnosis of brain tumor. He was partially demented. A few hours after admission, he suddenly began to gasp for breath, became very cyanotic, and died in five minutes. At necropsy, pulmonary embolism, and a tumor of the right frontal lobe were found.

CASE 23.—A woman, aged fifty-three years, entered the hospital with a fractured fifth thoracic vertebra. She had no symptoms of pressure and gave no evidence of neurologic condition. Suddenly a severe pain in the thorax developed, and the patient went into profound shock, and died suddenly. Necropsy disclosed pulmonary embolism.

CASE 24.—A man, aged forty-nine years, had a brain tumor. He entered the hospital apparently in excellent condition at 6:30 P. M. and was

listed for operation in the morning. At 10 P. M. he became unconscious, and died at 12 midnight. Necropsy disclosed a brain tumor of the right occipital lobe, with hemorrhage into the tumor.

CASE 25.—A man, aged fifty-two years, had been drinking heavily for two or three days. At 4 P. M. he passed a large amount of blood from the rectum. He was admitted to hospital in extreme shock, and died at 4 A. M. Necropsy disclosed acute, hemorrhagic gastro-enteritis. There was gross hemorrhage in the stomach and intestines.

CASE 26.—A man, aged thirty-seven years, was a victim of grand mal. He had had convulsions for several years, and was found dead on his bed, with his face buried in the bedding. The body was markedly cyanotic. Suffocation during a convulsion seemed to be the cause of death. At necropsy some edema and congestion of the frontal sinuses were found, but nothing abnormal was found in the brain.

CASE 27.—A man, aged thirty-eight years, had cirrhosis of the liver with ascites, and a ruptured esophageal varix. He went into a state of shock and died in twelve hours. Necropsy disclosed cirrhosis of the liver and a ruptured esophageal vein.

CASE 28.—A man, aged thirty-seven years, had heat exhaustion. He was a sufferer from bronchial asthma. He became suddenly ill, and was admitted to the hospital about thirty minutes later, in coma. His temperature was 107.8° F.; fifteen minutes later, acute pulmonary edema developed, and the patient became very cyanotic. He was packed in ice and placed in an oxygen chamber, but he had a convulsion and died. Necropsy disclosed mild chronic bronchitis, but death was believed to be due to heat exhaustion.

SUMMARY

Cases in which sudden death is followed by necropsy are not common. Conclusions drawn from death certificates in cases in which necropsy is not performed are unreliable. In a series of twenty-eight cases in which relatively sudden death occurred, among 1,172 cases in which necropsy was performed, coronary thrombosis was the most common cause, with an incidence of

36 per cent. Cerebral hemorrhage was second, with a percentage of 14. Pulmonary embolism was third, with an incidence of 10 per cent.

TABLE 1

CLASSIFICATION OF CAUSES OF SUDDEN DEATH	
CARDIOVASCULAR SYSTEM	
Thrombosis	Coronary
	Cerebral
	Mesenteric
Embolism	Pulmonary
	Cerebral
	Coronary
	Fat
Hemorrhage	Cerebral
	Pulmonary
	Rupture of Aneurysm
	Rupture of Esophageal Varices
	Postpartum
	Hemorrhagic Purpura
	Hemophilia
	Rupture of Myocardium
	Angina Pectoris
	Ventricular Fibrillation
RESPIRATORY SYSTEM	
	Laryngeal and Tracheal Obstruction
	Foreign Bodies, Edema, Polyp
	Suffocation
	Strangulation
CENTRAL NERVOUS SYSTEM	
	Rupture of Cerebral Aneurysm
	Hemorrhage Into Brain Tumor
	Epilepsy
	Convulsion
	Shock
	Puncture (Venous, Spinal, Pleural, Pericardial and Peritoneal)
	Intensity of Emotion (Joy, Fear, Anger, Anxiety)
	Anaphylactic Shock
	Horse Serum (Most Common)
	Sting of Bee
	Heat Stroke
	Cold
	Toxic Effects (Bites of Snakes, Insects, and So Forth)
	Status Lymphaticus (?)
	Many Deaths from Trivial Causes Are Explained on This Basis
ACCIDENTS AND TRAUMA	

TABLE 2

INCIDENCE OF SUDDEN DEATH IN 1,172 CONSECUTIVE CASES IN WHICH NECROPSY WAS PERFORMED

Diagnosis	Cases	Males	Females	Interval Between Time When Death Apparently Had Become Imminent, and Its Occurrence
Coronary Thrombosis	13	11	2	Few minutes to five hours.
Cerebral Hemorrhage	5	3	2	One to twelve hours.
Pulmonary Embolism	3	2	1	Few minutes.
Cerebral Embolism	1	1	..	Six hours.
Ruptured Cerebral Aneurysm	1	..	1	Three hours.
Brain Tumor; Hemorrhage Into Tumor	1	1	..	Two hours.
Cirrhosis of Liver; Rupture of Esophageal Varix	1	1	..	Twelve hours.
Gastro-Intestinal Hemorrhage; Gastro-Enteritis	1	1	..	Twelve hours.
Heat Exhaustion	1	1	..	Two to three hours.
Epilepsy (Convulsion)	1	1	..	Unknown.



# Hereditary Ptosis

C. WM. FORSBERG, M.D.

Sioux Falls, S. D.

**H**EREDITARY ptosis is one of the interesting abnormalities of the upper eyelids, the cause of which is not sufficiently understood. In 1921 Dinitry<sup>1</sup> made a plea for the study of this condition from case reports rather than from the laws of heredity. He also advocated the adoption of a simple form of case report which would act as a stimulus for the reporting of cases of ptosis now neglected.

Ptosis is a serious condition. It is nearly always bilateral, and it interferes with the vision of both eyes.

One writer has advocated that people who may have hereditary ptosis should not marry in order that it may be eliminated.

### Types

There are two types of ptosis: congenital and acquired. The congenital ptosis is, of course, usually bilateral, other defects frequently accompanying it. The acquired ptosis may occur in one eye or both. It comes on after birth and is likely to affect both eyelids if it is of the hereditary type.

### Etiology

The true congenital ptosis arises from the absence or arrested development of the levator, from some interference with the muscle, or from paralysis affecting some part of the oculomotor nerve or nucleus.

(Note that the elevation of the upper lid is controlled by the superior branch of the oculomotor nerve<sup>6</sup> and that the palpebral fissure is closed by the orbicularis oculi, which is innervated by the facial nerve.)

Acquired ptosis, occurring at any age is probably due to atrophy of the levator muscle or to degeneration of the third nerve nuclei in middle life in women.

The cases due to adiposity or to inflammatory conditions, such as trachoma, are not considered in this paper.

### Diagnosis

The condition is diagnosed by a drooping of the upper eyelids, due to an inability to elevate them. The eyelids therefore cover the upper half of the cornea. The patients hold the head tilted backward so that they may look under the lids. The forehead and eyebrows are raised, since the frontalis assists in elevation of the lids. There are frequently associated palsies, of which paresis of the superior rectus is the most common.

### Treatment

The treatment is mostly surgical or the treatment of its complications. It is, of course, not entirely satisfactory.

### Genealogy of Cases

The following reports a group of sixty-seven individuals comprising a genealogy of five generations, thirteen of whom have had hereditary ptosis.

Tracing back the ancestry of the group, we find that one ancestry was started in Wisconsin by the union of a man of Irish descent and a woman of English descent. The other ancestry was formed by the marriage of a woman from

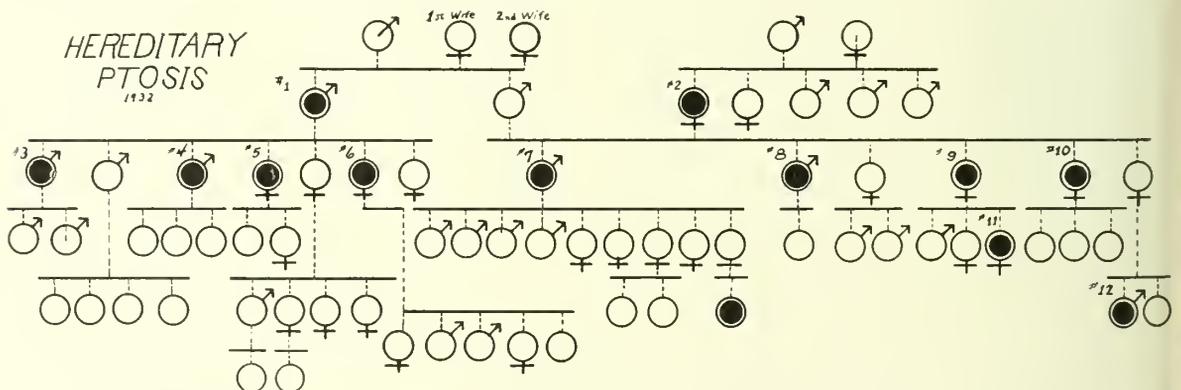


Fig. 1. Chart showing twelve cases of hereditary ptosis in five generations comprising a family tree of 67 individuals. Affected individuals are shown in black rings, unaffected in white rings. Females shown by cross below and males by upward arrow. In the undesignated the sex was not known.



CASE 3

CASE 7

CASE 8

Michigan to a man whom she met there. Her husband later remarried, thus accounting for the fifth grandparent. It was well established that the ptosis was not present in the five grandparents, since they lived to a ripe old age and were observed by many of the grandchildren.

#### *Deductions*

A study of the chart and the cases permit us to make a few interesting deductions. Since there are so few cases we cannot consider these deductions final. There are two independent sources of the ptosis. One set of cousins might have received the disease from both sources. The other group, however, could have received it from only one source. In both groups, four out of seven cousins were affected.

Of the total males, six were afflicted, and eighteen were not. Similarly, of the total females, six were afflicted, and eighteen were not. The sex of the remaining offspring was not known.

The condition is not related to sex since six cases were males, and six females. It is interesting to note that it is transmitted through both males and females, and that these may be affected or unaffected. In one case an unaffected female transmitted the condition to a male offspring; in another case, an unaffected male transmitted it to two male and two female offsprings. This is contrary to the cases of Dimitry, who found in his cases of congenital blepharophimosis, that the condition was never transmitted by normal individuals. These cases, however, are true ptosis. We do not know in this group of cases which individuals will still show it.

Of these twelve cases of ptosis, two appeared at the ages of six to eight years; four, at the ages of ten to twelve years; three, at the ages of fourteen to seventeen years, and four at the ages of twenty to twenty-two years. Since the condition developed most frequently at twenty years of age in the second generation, and since forty-three of the grandchildren are less than twenty years of age, it may be anticipated, if, in the fourth and fifth generation, the ratio of about two-thirds of the children will be affected as in the third generation—that about twenty-eight more individuals will develop it. It seems, judging from the two cases of ptosis present in the fifth generation, that the condition is appearing earlier in this generation than in the others. In this way it somewhat resembles Huntington's Chorea, from the hereditary standpoint. Three of these twelve patients suffered from a laryngeal condition (hoarseness).

CASE 1. (Mild ptosis) According to his daughter, this patient died at the age of 73. She has a picture of her father when he was fourteen years of age, and she recalls that it was present then.

CASE 2. (Severe ptosis) According to her son, she developed ptosis in both eyes at the age of seventeen. She was a twin to one brother who did not develop ptosis.

CASE 3. (Severe ptosis) According to the patient, himself, now aged thirty, he developed his trouble at the age of twenty-two. It gradually came on over a period of two years and is getting worse each year. In childhood he had no trouble with his eyes. He was carefully examined

by the Veterans Bureau, who decided, after spinal punctures, that it was not due to lues.

CASE 4. (Severe ptosis) According to his sister, this individual, now aged forty-two, developed ptosis gradually when he was twenty-two years of age. He is a big, husky fellow and well excepting for the ptosis and the fact that he could hardly talk above a whisper.

CASE 5. (Severe ptosis) Inspection of the patient now aged forty-four, reveals that the same severe degree exists as in the others. It came on gradually when she was about eleven years of age, and it has been getting worse for the past twenty years. When she was married at the age of twenty-eight, it was quite noticeable. At thirty-one years of age her voice troubled her, and this has been gradually getting worse. She also has had a diagnosis of myasthenia gravis, and in addition to the ptosis, has a keratitis marginalis. She is quite worried that her daughter, aged sixteen, will develop drooping eyelids.

CASE 6. (Mild ptosis) According to her sister, the condition is quite noticeable but not as bad as in the others. It began at about twenty years of age, and she has had it for fifteen years. In the last year or two, it has become somewhat worse.

CASE 7. (Severe ptosis) This individual, now aged forty-eight, has ptosis in both eyes. He has been hoarse for many years. Examination shows paralysis of orbicularis, no motion of frontalis and a certain degree of exophthalmus. Motion of the eyeball in all directions is limited and about

the same. The pupils react promptly to light and accommodation. Tension is normal. Fields: Practically central vision except nasal portions, which are distinctly contracted. O. D. 6/20-1. O. S. 6/12-1. Fundi: Discs pale, otherwise negative. Ears: whispers 15 feet. Nose, throat and sinuses negative. Cords approximate normally.

CASE 8. (Severe ptosis) This male individual, aged thirty-five, developed ptosis at twelve years of age.

CASE 9. (Slight ptosis) She is now forty-five years of age and has three children, a boy of twenty-two years of age, and two girls, one seventeen and one ten. Both eyes of the youngest are now slightly affected.

CASE 10. (Severe ptosis) She is now thirty-nine years of age, and when seen by her sister twenty-three years ago, she had ptosis in a severe degree.

CASE 11. (Mild ptosis) This is the daughter of patient in case nine, at the age of ten years, both eyes slightly affected.

CASE 12. The degree of ptosis here is not known. He is the oldest boy of a mother thirty-two years of age.

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## Interproximal Radiography

ELMER S. BEST, D.D.S.

*Minneapolis*

*This is the third of a series of articles written by Dr. Best for the Journal-Lancet on dental disorders which are closely allied with the general health of the individual, and are of especial interest to the physician.*

THE interwoven relation between the medical and dental professions has been based chiefly upon the effect that mouth conditions and dental activities have upon the rest of the body. The serious and far-reaching effect of mouth conditions has stimulated thinking dentists to bring about a refinement of methods of examining their fields of activity. Radiography of the teeth and investing structures has mainly centered around the location of hidden areas of infection situated at the root ends, and having

close association with the pulp or pulp canals of the teeth.

In searching for a basically sound method of preventing the occurrence of this infection instead of waiting for its development, there has been developed a system of oral radiography called interproximal radiography. The chief differences between interproximal and other oral radiographic methods lies in the fact that the films in the interproximal method are placed parallel with the roots and do not include the apices of the

roots. These films give us the very best outline of the crowns, necks and gingival positions of the roots, together with the adjacent structures. We are enabled to see all aberrant structures the best that it is possible for us to obtain.

These examinations are made with relative simplicity and should constitute a most important part of every complete oral radiographic examination. They are made in addition to the routine radiographic examination, and do not supplement it. Having a given set or radiograph of the whole mouth, interproximal radiogram should be taken often enough to obtain a satisfactory check-up of the teeth and as a final examination of all completed work.

Dr. Howard R. Raper, of Albuquerque, New Mexico, goes to considerable length into this new field of diagnostic endeavor. In fact, to Dr. Raper belongs the credit for introducing and developing this interesting technic. He states that last year more than half a million films were used in these examinations and that a greatly increased number will be used this year. Comparing this new radiographic method with those in more general use, the exactness of the interproximal method becomes at once apparent. The various interpretations possible in root end radiographs are abundant. There is only one possible mistake in interproximal interpretation and that is due to the normal concavity appearing on the surface of certain roots which causes a radiographic translucency, simulating caries. Familiarity with the anatomy of the parts, however, will minimize this error.

The areas of, and those lying immediately adjacent to, the necks of the teeth offer an interesting field for investigation. It is here that we find symptoms of early pyorrhea and dental caries. The measure of success met with in the treatment of these two diseases is very largely influenced, the same as in other fields of medical science, by detecting them in their incipency. Up to the age of about thirty years one can expect to find small cavities appearing in the enamel just under the contact point with the other teeth, while after thirty years of age begin the early signs of pyorrhea, and then after sixty years of age we find senile cervical cavities. In the event of the latter condition gaining much headway it presents an extremely difficult problem, due to its location and the great amount of tooth structure that must be

removed to properly fill the cavity, consequently the great value in early detection.

Vast numbers of these proximal cavities develop to the point where the pulp becomes infected, though it may not exactly degenerate. This frequently takes place while the cavity is still well hidden. In such cases larger metal restorations become necessary. Next comes the question of what happens to the pulp of a tooth already invaded with micro-organisms when it has been sealed up and asked to assume the load of a large metal restoration, involving, as it does, extreme shocks of heat and cold. It is now a matter of history that laboratory examinations of teeth carrying these large restorations have revealed the fact that an appalling number of them have pulps still alive but seriously infected.

Teeth so infected create as serious a menace to the individual as so-called "dead teeth." Hence it would seem that if we are to properly protect the interests of our patients it will be necessary for us at regular intervals to carefully X-ray the teeth and adjoining structures, and including in our routine the interproximal method as an adjunct to the older and more commonly used plan.

It might be of interest to the medical reader to know that a very ingenious operation has been devised by Dr. H. K. Kellogg, of Louisville, Ky., to take care of these small carious areas developing just under the contact points in molars and bicuspid. A small shaft is made from the occlusal pit to the small pit or nick on the proximal surface. The rubber dam is applied, a gold wire the size of the shaft is selected, two or three small crystals of silver nitrate are packed into the small opening and the wire is malleted to place. Ammoniated silver nitrate is now used externally, a drop deposited around the contact point, following which formalin is applied. Thus the tiny area is attacked both from the outside and within. Dr. Kellogg reports seven hundred cases treated in this manner in eighteen months.

These two measures of diagnosis and prevention enables the dentist to control the diseases of the teeth in a large measure and indirectly it should prove a great boon to the general health of the individual. Inasmuch as prevention is the truly beneficial ideal that dentistry has to offer, any method by which we may improve the status of preventive dentistry as applied in general practice, brings honor to all.

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#### A NEW EDITORIAL BOARD MEMBER

The Editorial Board welcomes to membership Dr. J. C. Ohlmacher, who was appointed by Dr. W. A. Bates, president of the South Dakota State Medical Association, to succeed the late Dr. M. C. Johnston.

Dr. Ohlmacher has been a research student at Rush Medical College, instructor at Northwestern University Medical School, pathologist, clinical director and assistant superintendent at Independence and Clarinda, (Ia.) state hospitals and since 1918 has been professor of pathology, bacteriology, preventive medicine and hygiene at the Medical School of the University of South Dakota as well as director of the laboratories of the State Board of Health.

Not only do we welcome Dr. Ohlmacher into the family but we congratulate South Dakota on her representation.

#### THE NORTH DAKOTA STATE MEETING

The Forty-fifth Annual Session was held at Grand Forks, North Dakota, June 1st and 2nd. It may be that in material things North Dakota feels the "repression" as well as other portions of the country, but in spirit, the medical men at this session gave no sign of it. As is the case, and should be the case with every such meeting, the fellowship, the opportunity for personal contact and conference and for meeting of friends was of as great importance as the scientific features. The latter, however, were unusually worthwhile and enjoyable. The members of the

State Association gave the largest part of the program and the few guests present gave a little variety. The attendance, while not up to former standards, was better in proportion than most meetings being held at this time.

One feature of the meeting which deserves comment is the courtesy shown speakers by the members of the association in that there was little or none of the movement and confusion in the back of the room and the members stayed throughout the presentation of each talk leaving only between papers.

Another feature of the meeting which deserves special comment was that the music for the annual banquet was provided by the teachers and students of the Department of Music at the University of North Dakota at Grand Forks and was of exceptional quality. Professor and Mrs. Howard of the State University are deserving of thanks and praise for the part they took in the program and for their interest in providing it.

Dr. Paul H. Burton, of Fargo, is president for the coming year and will preside at the next meeting, which will occur in Valley City in 1933.

S. M. W.

#### WELCOME GRADUATES

In our midst we see new faces every year.

The 1932 commencement exercises are over and the newly graduated M.D. has been added to our ranks.

We, as a profession, have certain standards and traditions. We want and expect the new arrival to live up to them. We must, however, not disappoint him, in what he may expect of us. We, too, have duties to perform.

Let us not disillusion him at the beginning.

Let us receive the young doctor with that kindness which should be shown by an elder brother. He, in turn, and in like manner, will show the way too, and guard the early footsteps of those that follow; thus maintaining, incorruptible, one

of the most beautiful tenets of our profession, as it was handed down to us, even from the time of Hippocrates.

May each have occasion to cherish pleasant memories of his reception by the profession.

A. E. H.

#### DOCTORS AND STRONG DRINK

The above is the heading of an editorial in our esteemed contemporary *The Christian Science Monitor* February 28, 1932. It is based upon testimony alleged to have been given by Dr. Arthur D. Bevan, formerly President of the American Medical Association. There was a decided stirring up of the dry and wet bones following Dr. Bevan's testimony. The *A. M. A. Journal* let forth an editorial of censure against the Doctor, in its issue of February 13, 1932. Yet, at intervals, within the past few years, that last-named publication cited cases, especially from Illinois, where some physicians had been deprived of their liquor prescription blanks on account of their unlawful use. As far back as July, 1927, the *Moody B. I. Monthly* had quoted Dr. Bevan, under the heading "Medical Bootlegging," as having stated that at the Chicago Presbyterian Hospital, where twelve thousand patients are handled annually, its drug room had not been called upon to supply a single bottle of whiskey since Prohibition went into effect,—contrasting this record with that of the physicians prescribing liquor, and especially those who did so unlawfully, i. e., always managed to use or sell their allowance of four hundred prescriptions annually.

The *New York Times*, in one of its daily issues in March, 1932, showed that ninety-six doctors in one of the large cities in New York State were accused of selling their liquor prescription blanks; that fifty-five involved in earlier round-ups were also to be arraigned. Again, in April, this year, the same newspaper notes twenty-six other doctors facing the same charge; claimed that already many physicians have pleaded guilty. In regard to these charges, one of the officials of one of the medi-

cal organizations in New York courteously advises us that in certain instances the accusations were apparently unfair, that there is a form of "racket" in connection with liquor prescriptions which involves various methods of obtaining same. Some are stolen, others are not cancelled, and then sold, some are forgeries, some are counterfeits, and some are probably obtained by direct purchase from physicians.

If some of these men actually have gone beyond their legal rights, why get hysterical and unduly sympathetic, and also why abuse Dr. Bevan for throwing on some light? It now seems as though Prohibition (which some of us thought earlier, a good plan for the other person, male or female) is heading for the side-tracks, and that after a few years Aesculapius, Hippocrates, and the now-present high-jacker bootleggers need have no further concern about that part of the public whose chief malady is an overpowerful alcoholic thirst.

It is perhaps not amiss here to record that in a far Western State recently the following Court decisions were given:

The Federal Narcotic Bureau refused to compromise anti-narcotic charges against Dr. —;

A physician pleaded guilty and was fined \$1,000.00 for deliberately making false affidavits in connection with favoring a veteran's claim;

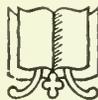
Four doctors pleaded guilty to charges similar to the preceding.

Then, on the other hand: An investigation proved that sixty-two prescriptions for morphine sulphate alleged to have been signed by a prominent Western physician, actually had been forged by a nurse, who was later committed for treatment of her drug addiction.

MORAL (1) Carefully conceal your Governmental prescription blanks and your supervised-by-law supplies;

(2) Don't trust implicitly your friends or the dear public.

A. W. S.



## Proceedings of the Minnesota Academy of Medicine

Meeting of March 9, 1932.

**T**HE regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, March 9, 1932. Dinner was served at 7 p. m., and the meeting was called to order at 8 o'clock by the President, Dr. J. C. Litzenberg. There were 49 members present.

Minutes of the February meeting were read and approved.

Dr. L. E. Daugherty read the Necrology Committee's report on the death of Dr. H. Longstreet Taylor.

DR. HENRY LONGSTREET TAYLOR,  
1857-1932

Henry Longstreet Taylor, son of David Hendrickson Taylor and Laura Carroll Taylor, was born August 19, 1857, at Cincinnati, Ohio. His boyhood was spent in Cincinnati. He attended Haverford College at Haverford, Pennsylvania, receiving a B. A. degree in 1878. The year 1878-79 was spent at the University of Berlin. Returning to this country he matriculated at the Medical College of Ohio, from which he was graduated in 1882. For the next three years he pursued postgraduate medical studies at the University of Strassburg, Vienna, Berlin and London. During this period, Dr. Taylor studied under some of the greatest medical authorities in Europe, among them Koch and Lister. In 1885 he entered practice in Cincinnati and was appointed Associate Professor of Surgery at the Medical College of Ohio. On the basis of postgraduate work done in America and Europe, Haverford College granted him a Masters Degree the same year.

Ill health forced Dr. Taylor to give up his practice and his position in the Medical School in 1889. He spent the next four years in practice at Asheville, North Carolina.

Dr. Taylor came to St. Paul in 1893 and remained there until his death January 2, 1932. During the early years in St. Paul he specialized in diseases of the nose, throat and lungs. As time went on he became more and more identified with lung diseases, particularly the study and prevention of tuberculosis. It is safe to say that previous to 1901 the treatment

of tuberculosis was little better than it was before Koch's discovery of the tubercle bacillus. It was in this year that the Governor appointed a commission, with Dr. Taylor as chairman, to investigate the need of a state sanatorium. Two years later the legislature created a permanent Advisory Commission, on which Dr. Taylor served until 1918. The state sanatorium was opened in 1907. These commissions developed and put into operation the Minnesota plan of state and county sanatoria, which is the equal of any system for the care of the tuberculous in this country. Dr. Taylor was the dynamic force on these commissions, and it was through his energy and perseverance that the present plan for the care of those afflicted with tuberculosis was made possible. He maintained that the State Sanatorium should be for the care of early cases whose chances of recovery were good, and that the county institutions should be primarily for the more advanced cases. He realized early that the advanced case of tuberculosis in the home was a real menace to the family and community, and, furthermore, that a high mortality rate in a sanatorium did not necessarily mean that the institution was not serving an extremely useful purpose.

For the care of tuberculous patients who did not wish to go to public institutions, he established a private sanatorium at Pokegama, Minnesota, in 1905. This was the first permanent sanatorium in the state; the second was the State Sanatorium at Ah-Gwah-Ching near Walker, Minnesota. Between 1913 and 1919 fourteen county sanatoria were established in various parts of the state.

The Ramsey County Preventorium, the third institution of its kind in the United States, was opened in July, 1915. Dr. Taylor was medical director of the Preventorium from the time it was established until his death.

In 1906, Dr. Taylor started the Minnesota Association for the Prevention and Relief of Tuberculosis. This was incorporated as the Minnesota Public Health Association in 1914. He was elected President of the Association in 1924.

Dr. Taylor was elected Vice President of the National Tuberculosis Association in 1925, and

President in 1927. He was made an honorary life member of the Association in 1930.

In recognition of his accomplishments in anti-tuberculosis work, Haverford College honored him with an LL.D. degree in 1928.

For many years Dr. Taylor was a member of the Minnesota Academy of Medicine, and was President of the Academy in 1922.

Dr. Taylor was a member of the American Climatological and Clinical Association, the International Tuberculosis Union, the American Sanatorium Association, the Mississippi Valley Tuberculosis Conference, the American Medical Association, and the Ramsey County Medical Society. He was one of the organizers and a past president of the Minnesota Trudeau Society, and until his fatal illness, was extremely active as president of the Ramsey County Public Health Association.

Dr. Taylor is survived by his widow, Mrs. Ethelberta Geer Taylor, a son, Henry Longstreet Taylor, Jr., and two daughters, Mrs. Antonio Nicolich and Laura Carroll Taylor.

Dr. Taylor was both a student and a crusader. His life was devoted unstintingly to combating a disease that is primarily an enemy of youth and those in the most productive period of life. His grasp of the many phases of attack necessary for eradicating this disease placed him among the pioneers. His vision, courage and progressive open-mindedness to any advance in the treatment of tuberculosis have been justified amply. The low death rate from tuberculosis in Minnesota is largely due to the program evolved and advocated by Dr. Taylor more than a quarter of a century ago.

He was an early and ardent advocate of the use of roentgenology in the diagnosis of pulmonary tuberculosis, and of the Von Pirquet and Mantaux tuberculin tests to discover incidences of infection in children. He used artificial pneumothorax in selected cases long before it was generally accepted in this country. He advocated extrapleural thoracoplasty years before his associates were persuaded to adopt it.

Minnesota is in the vanguard of the states in its war on tuberculosis and the Minnesota Plan is the lengthening shadow of Dr. H. Longstreet Taylor.

In the words of the great bard:

"His life was gentle and the elements  
So mix'd in him that Nature might stand up  
And say to all the world, 'This was a man!'"

THE COMMITTEE.

Dr. J. C. Brown read the following Necrology Committee report on the death of Dr. John F. Fulton:

In Memory of  
DR. JOHN FARQUHAR FULTON,  
1856-1932

In the death of Dr. Fulton on February 1, 1932, the Minnesota Academy of Medicine lost one of its three remaining St. Paul founders, and the first president of this Academy.

Dr. Fulton was born in York County, Pennsylvania, on April 20, 1856. He was the youngest child in a family of seven children. His father was a Presbyterian minister. His ancestry in this country dates back to two brothers, Robert and James Fulton, who came from County Donegal, in northern Ireland, and settled in Philadelphia about 1730. The former brother, Robert, settled in Lancaster, Pennsylvania, and his son, Robert Fulton II, was the inventor of the steamboat. The other brother, James, had a son, James II, a merchant in Philadelphia, who at the time of British occupancy was forced to flee from Philadelphia, and settled in York County, on a farm about fifty miles south of Philadelphia. It was from this branch of the family that Dr. Fulton sprang, and it was on this farm that he was born.

His early education was in three nearby rural schools, five to ten miles from the farm, and to which he walked while attending school. When he was eighteen he entered York Collegiate Institute, where he attended for nearly three years in the study of Latin, Greek, mathematics, chemistry, and literature. It was while at York that his classical teacher, Professor McDougall, advised young Fulton to study for the ministry, and his parents were told that he had all the instincts and abilities for a preacher. His eyes gave out in his second year's work, and Mr. Henry Small, the founder of the college, took him to Philadelphia to consult the doctors about his eyes. He returned with glasses, but was not relieved from his discomfort. After missing a great deal of school at York Collegiate Institute, he went on his own account to Easton, Pennsylvania, and attempted to enter Lafayette College. His eyes troubled him so much that he returned to the farm, and it was then that the Fulton's family doctor, William Smith, recognized young Fulton's interest in the functions of the body, and advised him to study medicine. This he did, and matriculated at the Uni-

versity of Pennsylvania Medical School in September, 1877. At that time he consulted the late Dr. Samuel Risley, who recognized the condition peculiar to his eyes, and fitted him with myopic astigmatic lenses, which he then wore with comfort. Dr. Risley and Dr. Fulton always remained fast friends, and at medical conventions would be seeking each other. Among his classmates at the Pennsylvania Medical School were Reichert, Howard Kelly, and Whitehead. Among his teachers were Leidy, Harrison Allen, the elder Pepper, and Horatio Wood. He has related to members of this society of the lectures given by S. Weir Mitchell. In addition to his medical degree, which was granted in May, 1880, he was given a M. S. on a thesis, "Exophthalmic Goitre," and a Ph.D. degree on "Inherited Tendency and Its Treatment."

After three months' service at the Pennsylvania General Hospital, doing general surgery, he went to Will's Eye and Ear Infirmary in Philadelphia, where he worked under Risley, Goodwin, Keyser, and Strowbridge. Later he served at the Old Pennsylvania Hospital, doing Surgery under Gross and Agnew; the latter he always held in high esteem. Some time during 1880 he moved to Altoona, Pa., and established himself in a large practice in general medicine. Here he remained for two years with the congenial surroundings of the Jaggard family.

In 1882 the American Medical Association held its meeting in St. Paul, and while attending the meeting Dr. Fulton became attracted to the surroundings in St. Paul, and decided to settle there. Dr. Agnew had given him letters of introduction to Dr. Hand, one of the original founders of the Ramsey County Medical Society, and, through Dr. Hand's advice, he took over Dr. Atwood's office, located at Third and St. Peter Streets. Dr. Atwood, a competent ophthalmologist, had died a few weeks after Dr. Fulton's arrival in St. Paul. In a short time Dr. Fulton was established in ophthalmic practice. Through the enthusiasm of Dr. Fulton, Dr. Edward Jaggard, a young lawyer and his life-long friend, was induced to come to St. Paul, and subsequently became judge on the Supreme Bench.

In 1888, Dr. P. H. Millard and Dr. Fulton conceived the idea that a medical school should be developed in connection with the newly established Minnesota State University, and in 1889 they succeeded in getting a bill through

the legislature appropriating \$100,000 for the first building. The initial organization of the school was undertaken by four members, Drs. Fulton, P. H. Millard, R. O. Beard, and C. Eugene Riggs. Dr. Fulton held a chair of Ophthalmology and Otolaryngology in the Medical Department from 1888 until the time of his death. Dr. Fulton opened the first outpatient clinic for the treatment of indigent patients in connection with the new Medical School. There was an announcement made to the effect that Dr. John F. Fulton would meet at a certain hour on Tuesdays, any such patients afflicted with diseases of the eye, ear, nose, and throat.

Dr. Fulton was secretary of the Ophthalmological Sections of the American Society in 1886; member of the Council of the Otolaryngological Section of the International Congress, which convened in Washington in 1887; the first president of the Minnesota Academy of Medicine in 1888; President of the Ramsey County Medical Society in 1893; secretary of the section on Laryngology, Otology, and Rhinology of the American Medical Association in 1893-94. During the administrations of Governor Knute Nelson and Governor David Clough he was surgeon-general to the State of Minnesota.

Dr. Fulton was married to Miss Edith Wheaton, sister of Drs. Robert and Charles Wheaton, in St. Paul, April 11, 1888, who survives him. He is also survived by five children, four daughters and a son, and one sister.

Dr. Fulton was a man rather under average size, with a kindly interest and engaging manner in conversation. Whenever he spoke of some outstanding man in the medical profession whom he had met, and he knew many of them, he usually had some interesting anecdote to relate, often quoting the exact words of the speaker on that particular occasion. In addition to his broad grasp and profound understanding of the special field of medicine to which he devoted his life, Dr. Fulton's personality possessed a charm that made for him uncounted friends. To the members of the medical profession he was a continual stimulus. He was always interested in the careers and in the welfare of the younger men in the profession, and he sought always to encourage them in their struggles for recognition. Not only was he great as a physician, but he was a true friend.

Dr. Fulton made it his business to attend

regularly the various society and academy meetings, and to take part in the presentation of papers and the discussions, nor did he fail to recognize and commend any meritorious work of his colleagues, and especially of the younger men.

He was very much interested in protein therapy and contributed several papers to its use in iritis and other eye diseases. He was a willing auditor in all fields of medicine, and was interested in and well-posted on the world's history and present political and economic conditions.

He practiced his profession until within two weeks of his death. As a member of this Academy we will always remember Dr. Fulton as a most kind and generous associate, giving of his time freely and of his experiences generously. The members of the Minnesota Academy of Medicine extend their sympathy to Mrs. Fulton, her son and daughters in their bereavement.

(Signed) THE COMMITTEE.  
S. MARX WHITE,  
J. S. GILFILLAN,  
JOHN C. BROWN, *Chairman*.

The scientific program consisted of the following:

Dr. Clayton K. Williams (St. Paul) read his Thesis, entitled "Non-Specific Protein Therapy."

Dr. Wm. F. Braas (Rochester) reported the following case of "Recurring Renal Lithiasis":

Several years ago I reviewed the postoperative results in over 1,000 patients operated on at the Mayo Clinic for nephrolithiasis, and found that stone recurred in approximately 10 per cent. Recurrence subsequent to a second operation occurred in only a few patients, approximately 2 per cent. A large number of patients were also observed in whom operation was not indicated. Among them were a few who gave a history of having passed stones repeatedly. It is evident, therefore, that repeated recurrence of stone is not common, and that when it does occur etiologic factors are present other than those causing the usual single or occasional stone. Unfortunately, the exact factors involved in the etiology of lithiasis are still unknown. Observers are divided as to whether stone formation is caused by abnormal metabolism or infection. There is reason to believe that both factors may be involved. It is quite generally accepted that

abnormal metabolism is the usual cause of recurrent stones composed of uric acid, cystin and xanthin. This is shown by the fact that uric acid stones will cease to form when the patient is placed on a purin-free diet. Repeated stone formation may, however, also be dependent upon infection, such as occurs with urea splitting bacteria. It has been shown that there are several types of bacteria which have urea splitting power. According to Eisenstaed, staphylococci having such properties are most frequently found in conjunction with renal stone, while Grossman has found that *B. coli* are predominant. Recent bacteriologic studies at the Mayo Clinic by Hager and Magath have shown that infection with proteus ammoniae is often the direct etiologic factor in the formation of phosphatic stones. That some anatomic factor causing retention in a calyx, the renal pelvis, or the ureter may be a primary factor permitting such infection is also possible. Most recurring stones of this type are composed largely of calcium phosphate. Renal stones composed of fibrin are exceedingly rare, and particularly so in cases of repeated stone formation.

The case which I am reporting tonight is one with frequently recurring stones composed largely of fibrin, involving both kidneys, and apparently caused by renal infection with proteus ammoniae.

The patient, female, aged 24, was well until March, 1930, when three months pregnant she developed severe left renal colic, which was followed by several minor attacks of pain. Shortly after delivery, in August, 1930, she had repeated severe left renal colics, accompanied by pyuria. X-ray examination showed a shadow about 1 c.m. in diameter in the pelvis of the left kidney. On cystoscopic examination evidence of infection was found in the left kidney; the right was quite normal. A left pelviolithotomy was done elsewhere in December, 1930. The stone removed was composed of soft, spongy material, combined with a phosphatic deposit.

Within two months the pain reappeared in the left kidney, and reontgenograms again showed a large recurring stone. At operation in March, 1931, the kidney was found to be small and deformed, with a dilated pelvis, which was filled with a soft material, and nephrectomy was done. Following this operation the patient made an uneventful convalescence, and was quite well for three months. In Au-

gust, 1931, she had her first pain referred to the right kidney area, accompanied by anuria for sixteen hours. A roentgenogram was negative. An intravenous urogram showed a large filling defect in the pelvis, and a diagnosis of a large soft stone was made. In September a large fibrin calculus was removed. The pelvis of the kidney was lavaged with salt solution, and ureteral bulbs were passed up the ureter. She was in good condition until two months later, when she had a recurrence of her symptoms, and the x-ray again showed a large indefinite shadow in the right kidney area.

The patient came to the Mayo Clinic on December 3, 1931. She had been in bed during the last few weeks and complained of considerable tenderness in the right kidney region. Our x-ray studies corroborated the previous finding of a large soft shadow in the right kidney area. An intravenous urogram showed the pelvis to be almost entirely filled with calcified material. There was evidence of renal insufficiency, as shown by a blood urea of 69 mg. The necessity of immediate removal of the stone was evident, and this was done by Dr. Judd on December 11th. The kidney was inflamed and friable, and was bound down by perirenal adhesions. The pelvis of the kidney was filled with a soft, fibrinous mass, which was removed in pieces. Chemical analysis of the stone and microscopic sections showed that it was composed almost entirely of fibrin. Throughout its substance there were a number of small deposits of calcium phosphate crystals.

Four weeks after operation the patient again passed a soft stone 2x1 cm. in diameter, composed of fibrin, with numerous deposits of calcium phosphate crystals scattered throughout its substance. Following this she passed three stones of a similar nature at interval of ten days to two weeks, attended by renal colic. Subsequent to this, on two occasions, she passed a fine, powdery, white substance which on analysis was found to be composed of almost pure crystals of calcium phosphate. X-rays have been persistently negative until six weeks ago, when a roentgenogram showed an oval shadow in the right renal area, with a fair degree of density and about 2x1 cm. in size. This has remained stationary in size since, as shown by subsequent films, and has caused no pain in the kidney.

In view of the almost malignant growth of the stone, it was first thought that an abnormal

form of metabolism might be present and an effort was made to correct it. Because of the predominant fibrin constituent of the stones, the possibility of some abnormality in the blood was considered. A careful study of the blood was made by Dr. Watkins and nothing was found other than a moderate reduction in hemoglobin. The coagulation time and bleeding time were quite normal. It would hardly seem possible, therefore, that the fibrin deposit was the result of a blood dyscrasia. In conjunction with Dr. Russell Wilder, we examined her for possibilities of some error in metabolism. Thinking that there might be a deficiency of Vitamin A, which has been regarded as a possible factor in stone formation, this was added to her diet without any apparent effect on the subsequent course. She was also given yeast daily over a long period of time. It had been suggested that there might be a superabundance of cholesterol in the urine or blood, but chemical analysis failed to show any. Chemical tests of the urine made by Drs. Boothby and Adams showed a persistent marked reduction in the citric acid content. This was checked repeatedly and found to be consistent. Since citric acid is a solvent of calcium phosphate, it seemed advisable to attempt to overcome this deficiency by the introduction of large amounts of citrates. This was tried over a period of several days without any change in the chemical composition of the urine.

Following the operation cystoscopic examination showed the presence of some 25 or 30 cc. of residual urine with some slight obstruction at the ureteropelvic juncture. This area was repeatedly dilated by means of large ureteral catheters and bulbs. As a result, the amount of residual urine has been reduced to 2 or 3 cc.

Analysis of the urine in the pelvis showed it to be extremely alkaline, the pH readings being as high as 8.6. Bacteriologic studies of the urine showed almost a pure culture of proteus ammoniae. It is well known that proteus ammoniae favors the deposit of calcium phosphate crystals, and it seemed probable that such infection was a large factor in the stone formation. An attempt was made to overcome the alkalinity of the urine by means of a ketogenic diet and large doses of ammonium nitrate. In spite of this the pH of the urine never was brought to an acid level and seldom went below 6.4. She was unable to tolerate

this treatment over a great length of time because of gastric upset.

In our effort to overcome the proteus ammoniae infection, we established continuous drainage of the renal pelvis over a period of three days and lavaged the pelvis with strong silver nitrate solution, without materially affecting the bacterial growth.

An attempt was made to dissolve the reforming fibrin stones by means of lavaging the pelvis with karoid, which is an enzyme employed in destroying dead organic material. We used this in a solution as strong as 10 per cent, but were unable to make an impression on the stones. On the supposition that the stone now present is composed of calcium phosphate, we have recently lavaged the renal pelvis with phosphoric acid, in a solution of 1 and 2 per cent, as suggested by Randall. Although so far this has not affected the stone, it has apparently been a large factor in reducing the infection in the renal pelvis. At one time recently microscopic examination of the urine catheterized from the right kidney showed no pus or bacteria.

The patient's general condition is now apparently normal. She is voiding a normal amount of urine, which contains a small amount of pus and many proteus ammoniae. The urine is less alkaline than formerly, the last pH reading being 6.9. Her last blood urea estimate was 28 mg.

Although the problems involved here have been difficult to solve, we feel that considerable progress has been made. It may be inferred that the renal stones were the result of infection with proteus ammoniae. It is possible that this infection followed inadequate drainage caused by ureteral pathology arising during pregnancy. As the result of treatment received, the degree of infection and the amount of residual urine in the renal pelvis have been greatly diminished. The composition of the stone has been changed from a predominant fibrin to a definite calcium phosphatic consistency. If the stone now present can be removed, we hope that with persistent efforts free drainage from the renal pelvis can be maintained, and that the proteus ammoniae infection, which is apparently the etiologic factor, will eventually be overcome.

#### DISCUSSION

DR. A. SCHWYZER (St. Paul): Only once have I seen some elastic stones that were passed, but they had a very different etiology. There was a hole in the blad-

der which came from a diverticulum of the sigmoid. The patient, a woman, came to the office one day with 22 stones in a box which she said she had passed in the course of two years. They were elastic.

This case is interesting as the formations are principally fibrin. If you learn that it is fibrin, you have to figure that it is of infectious character and that the infection is most probably in the pelvic mucosa. Dr. Braasch said the stone was removed by pyelotomy. That brings to my mind one point which I want to mention. For a long time I had the conviction, and Dr. Cabot when he was here a short time ago brought out the same point, that if we did a nephrotomy instead of a pyelotomy we would have less danger of a recurrence of stones, for if we drain through the pelvis we do not get a normal condition in the pelvis as long as the catheter is in there. The catheter irritates, and we do not eradicate the infection. I recall a case that had stones in both kidneys; the patient had been operated upon in Iowa in 1913 for a right-sided calculus. She had a stone at that time in each kidney. In 1918 she came to us and we found a stone in each kidney, each stone the size of a small walnut. Now she had pain in the left kidney. We operated on the left side by pyelotomy and took that stone out. She came back in 1923, and to my amazement she had large and multiple stones in both kidneys. We reoperated on the left side and removed the stones by nephrotomy. After the operation we saw a little shadow in the x-ray the size of a pea. That was in 1923. I have seen her rather recently (within the last year) and that shadow has remained exactly of the same size as it was in 1923. As I said, the second time we made a nephrotomy and put in two fine catheters side by side through the cortex. We left them in for about a week until we felt sure that we had the infection taken care of. We instilled daily nitrate of silver, and after the tubes were removed, did this from below a number of times. Thus this patient had two pyelotomies and the condition became worse than before. After an extensive nephrotomy, she is now in good condition and the urine is practically clear. In these cases if we operate by nephrotomy we have more of a chance to eradicate the infection. It is in the pelvis that these stones form and the less we damage the pelvis the more chance we have of curing the condition. I notice Dr. Braasch stated that in his case there was a rather large pelvis. There is probably a little stricture in the passage between pelvis and ureter.

DR. F. R. WRIGHT (Minneapolis): Stones in the genitourinary tract are of two varieties: either primary or secondary stones. Secondary stones which are formed are lime salts which are precipitated from the urine usually accompanying an alkaline fermentation. In studying the production of stones we overlook the fact that the urine is not water. It is a solvent for lime salts. When the solvent qualities of the urine are destroyed the urine loses its ability to hold lime salts in solution that are precipitated to form stones. It is possible, where secondary stones are formed in the pelvis of the kidney, that the urine secreted by that

kidney is normal, but that its solvent quality is destroyed by the products of infection which is present in the pelvis or in the bladder.

I have under observation at the present time a girl who gives the following history: She is a high school girl; three years ago while in school we found that she had a stone in the right kidney. That was in 1929. We removed that stone and she got along fine. She came in the other day not feeling very well. Upon investigation we find that she has three small primary stones in the right kidney and two or three in the left kidney. Some metabolic function which produced the stone in the right kidney in the beginning has now gone far enough to produce stones in the left kidney, which was normal at the time the right kidney was operated.

DR. BRAASCH (in closing): I want to thank the gentlemen who discussed this case report. In answer to Dr. Schwyzer's question as to the advantage of nephrotomy, it is quite manifest that in this case it would be almost impossible to remove the stone through the cortex, since the stone was so large that it would be difficult to remove it that way. However, when the stone is situated in a calyx it is advisable to do a combined nephropelviolithotomy. In this case I do not think the operation was a factor in causing recurrence. Retention of urine in the renal pelvis, together with infection with proteus ammoniae, were probably the most important etiologic factors. The importance of a urea splitting bacteria such as proteus ammoniae in the formation of stone is not generally recognized. I think that if the stone now present is removed and free drainage is established, the infection might be overcome. A large factor in the elimination of infection is the acidification of the urine. This can be accomplished better by means of a ketogenic diet than by any other method.

Dr. Emil S. Geist (Minneapolis) gave a lantern slide talk on "The Operation for Knee Fusion in Cases of Tuberculosis of the Knee."

The meeting adjourned.

R. T. LAVAKE, M. D., Secretary.

## Social Insurance

DR. EDWARD H. OCHSNER, M.D.

*Chicago, Ill.*

### *Quality of Medical Services Deteriorate Under Compulsory Health Insurance*

In preceding articles Social Insurance as a whole has been considered. In this and subsequent articles our observations will deal more particularly with Compulsory Health Insurance, one phase of Social Insurance. The chief danger to medical progress and efficient medical service to the American public comes from that small group who wish to establish lay bureaucratic control over the private practitioners of medicine and dentistry.

The state exercises a legitimate and proper function in public hygiene and sanitation, the teaching of per-

sonal hygiene in schools and colleges, in the medical care of paupers, criminals and the indigent in general, but whenever and wherever it has entered into the private practice of medicine it has always resulted in inefficiency. Even in institutional work, with the possible exception of University Clinics, the medical service rendered by the government is rarely excellent or even good, nearly always mediocre and often times even worse.

The health, happiness, prosperity and efficiency of the citizenship of any nation depends more upon the integrity, ability, unselfishness and enthusiasm of the medical and dental professions and upon the quality of medical and dental services rendered to the people than upon any one other factor. Any change in the practice of medicine and dentistry which will in any way hinder these professions from giving their best services will eventually react unfavorably upon the whole nation. That state medicine and Compulsory Health Insurance actually will and do lower the general quality of medical and dental services is supported by reason and experience. While it may level up a little from the bottom it unquestionably levels down from the top and it is this leveling down that will surely stop medical progress.

Medical progress depends not so much upon the rank and file of the profession as upon occasional great men with vision. If we unduly hamper these great medical minds, medical progress must cease. The quality of medical services received by the people in general depends in large measure upon the quality of teaching which the rank and file of the profession receive and upon the enthusiasm and the ideals which are instilled into them by their teachers. Men of great ability can do their best work only if absolutely free, and a physician under lay bureaucratic control never is entirely free. Andrew Carnegie, one of the most successful men of modern times in the best sense of that word, makes the following statement in his autobiography: "Thereafter I never worked for a salary. A man must necessarily occupy a narrow field who is at the beck and call of others."

One of the continually recurring misstatements in the Compulsory Health Insurance propaganda is that it encourages personal hygiene and consequently disease prevention. Nothing could be farther from the actual facts. Which person is more likely to take care of his teeth—the one who gets his dental services free, or the one who has to pay for it out of his own pocket? Those who claim the former just do not know human nature.

One of the chief causes of wonder of the Germans during the World War was the splendid condition of the teeth of the American soldiers as against the almost universally poor teeth of the Germans. Why this great difference? The chief and principal reason is that American citizens have their teeth taken care of by private dentists who take a very personal interest in each individual patient. Most American dentists and physicians are spending much of their time instructing their patients in general and oral hygiene. Contrast this with the work of the Krankenkasse physician of Ger-

many who asks his patient one or two questions, then reaches into a file, hands him a typewritten prescription and gets rid of him just as quickly as he can and as he must, if he is to see fifty patients in an afternoon office period of two hours; and this he is by force of necessity compelled to do if he is to make a living for himself and his family at twelve cents an office consultation. Then again the claim is made that Compulsory Health Insurance examinations are more thorough. This, too, is a statement contrary to fact and to reason when one realizes that the sort of office consultation above described gives the physician the same pay as a thorough physical examination does. No man can afford to make a careful, painstaking examination for twelve cents—not even in Germany, where living expenses are almost as high as in this country. One "Krankkasse" physician in Berlin told me personally that he made twenty-three house calls in four and one-half hours or at an average rate of one in a little less than twelve minutes, driving from house to house, going up from one to four flights of stairs each time, examining a patient and prescribing for him.

Brend states that in England the average time spent by panel physicians in making a diagnosis is from three to four minutes. Another English writer, in commenting on the above facts rightly observes that these are not abuses of Compulsory Health Insurance but inherent faults of the system.

We have all repeatedly seen and heard the statement that seventy per cent of the American people—namely, the low and moderate income classes—are not getting adequate and efficient medical services. Where those who make this statement get their statistics no one has ever been able to find out. The fact is that there are no statistics available on this point. From this it must be evident that the only place they can get these figures is from the depths of their fertile imaginations.

If we stop to investigate the source of these statements, we invariably find that they emanate from two classes of individuals—namely, a certain type of ultra medical specialist whose only experience is or has been with the extremely rich whom he charges fancy, exorbitant fees and with paupers whom he treats in charity hospitals. As a consequence he has had no personal experience with patients with moderate incomes and has no right to express an opinion on this subject. The other class who repeat these figures are usually persons who never have had personal experience with the practice of medicine and hence their opinions are practically worthless.

I maintain that the poorer classes of patients get better services in this country than they do in those countries of the world that have Compulsory Health Insurance and that their medical requirements are at least as efficiently met as are their food, clothing and particularly housing requirements. This phase of the problem is an economic one and can not be solved by a palliative such as Social Insurance is.

(The effect of Compulsory Health Insurance on the quality of medical services will be further discussed in the next article.)

## NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Dr. F. E. Lister, a prominent physician of Faith, S. D., died this month after a short illness.

Dr. Lottie G. Bigler, Yankton, S. D., has been appointed an assistant in the state health department.

Dr. I. A. Arneson, Starbuck, Minn., has moved to Morris, Minn., where he will continue in general practice.

Dr. D. J. Dierkes, formerly in practice at Rollingstone, has moved to Winona, Minn., and will continue in general practice.

Dr. W. F. Cobb, one of the pioneer physicians of Lyle, Minn., died at his home in that city on June 4th, at the advanced age of 85 years.

Fifty doctors and dentists of Butte, Mont., will contest a new city ordinance that requires a license fee in order to practice in that city.

Dr. W. J. Mayo, Rochester, has now rendered 25 years of active service as a member of the board of regents of the University of Minnesota.

Dr. C. W. Forsberg was the guest speaker at a meeting of the Altrusa club, Sioux Falls, his topic being, "Economic Waste in Medical Care."

Dr. Harry A. Baker, physician and surgeon, Minneapolis, died very suddenly on June 8. Dr. Baker was a graduate of the University of Minnesota.

Dr. O. J. Engstrand has sold his interest in the Warren, Minn., Clinic, to Dr. C. H. Holmstrom. Dr. H. M. Blegen is still president of the clinic.

Mrs. Edward Schons, St. Paul, was elected president of the Woman's Auxiliary to the Minnesota Medical Society, at the annual meeting last month.

Fort Pierre, S. D., has conveyed the land deed to the U. S. Government, and the new \$375,000 Indian Sanitarium for the care of tuberculous Indians will be started at once.

J. G. Norby, superintendent of Fairview Hospital, Minneapolis, was elected president of the

Minnesota Hospital Association at the annual meeting held at St. Paul last month.

Dr. B. E. Crawford, formerly connected with the Chamberlain Sanitarium, at Chamberlain, S. D., has retired from the sanitarium, and opened offices for general practice in that city.

Dr. W. J. Marshall, Missoula, Mont., has been named as medical officer at Fort Missoula, to succeed Dr. A. H. Treichler who is on a temporary leave of absence, owing to a recent accident.

Dr. C. F. Jump, Bozeman, has moved to Helena, and taken over the practice of the late Dr. Wm. M. Copenhagen. Dr. Jump was given a farewell dinner before leaving his former home.

At the annual meeting of the Brown-Redwood, Minn., Medical Society held at New Ulm, Dr. O. J. Seifert, was elected president, Dr. Albert Fritsche, vice president, and Dr. W. A. Meierding, secretary-treasurer.

Dr. E. O. Voyer will sail June 22 on the Ile de France for Europe. He will attend clinics in Paris and Vienna and will attend the British and Canadian medical convention in London. He will return about the first of September.

Dr. E. A. Meyerding, St. Paul, secretary of the Minnesota State Medical Society was the principal speaker at the annual meeting of the Minnesota State Pharmaceutical Society held in Minneapolis. Dr. Meyerding's subject was "Human beings will not permit themselves to be standardized."

The gold medal annually awarded by the Southern Minnesota Medical Society went to Dr. L. A. Buie of Rochester, for outstanding research in medicine and surgery. It was presented to Dr. Buie by the Minnesota State Medical association at St. Paul for his accomplishments in research in the treatment of intestinal disorders.

The eighth annual meeting of the North Dakota Health Officers Association was held at Bismarck on April 26th and 27th. A large number was present and a splendid program was presented for both of the two-day sessions. Dr. W. H. Moore, Valley City, is president, Dr. H. L. Halverson, Minot, vice-president, and Dr. A. A. Whittemore, Bismarck, secretary.

Mrs. M. D. Westley of Cooperstown, N. D., has been elected president of the Women's Auxiliary of the Sheyenne Valley Medical Society. The auxiliary is the first of its kind in the state. Mrs. L. Almklov, also of Cooperstown, is secretary and treasurer. Committee chairmen are Mrs. W.

Campbell, Mrs. F. Brown, and Mrs. C. J. Meredith, all of Valley City.

Hospitals are "racketeering" in their management of student nursing schools, Dean E. P. Lyon of the University of Minnesota medical school declared in an address before the National League of Nursing Associations at San Antonio, Texas. Dr. Lyon asserted that hospitals of the country are profiting to the extent of at least \$16,000,000 annually at the expense of unpaid student nurses.

Dr. W. A. Bates, president of the South Dakota Medical Society has appointed Dr. J. C. Ohlmacher, Vermilion, Professor of Preventive Medicine and Hygiene and Director of the Laboratory of the Medical School of South Dakota and State Board of Health, as a member of the Board of Editors of the Journal-Lancet for South Dakota to fill the vacancy caused by the death of Dr. M. C. Johnston.

Officers of the North Dakota State Medical Society for the coming year are as follows: Dr. Paul H. Burton, Fargo, President; Jesse W. Bowen, Dickinson, president elect; C. E. Stackhouse, Bismarck, first vice president; A. D. McCannel, Minot, second vice president; A. W. Skelsey, Fargo, secretary, and W. W. Wood, Jamestown, treasurer. Dr. Skelsey was named delegate to the American Medical Association meeting. Dr. W. C. Fawcett, Starkweather, was named alternate delegate.

Dr. F. E. Lister, pioneer physician of Faith, S. D., passed away recently, at the Black Hills Methodist hospital following an operation. Dr. Lister came to that section of the state in 1910, filing on a homestead about 45 miles northwest of Faith. In 1926 he gave up farming and moved to Faith, where he resumed his practice of medicine. While here he made many friends. He was an active member in the Masonic Lodge, the Lions Club, the Methodist church, and the District and State Medical Association.

The third District Medical Society held their annual meeting June the 3rd at Madison, S. D. The following officers were elected for the coming year: President, Dr. Magni Davidson; Vice-President, Dr. E. W. Goldman; Secretary-Treasurer, Dr. R. K. Miller; Censor, Dr. Geo. E. Whitson, and Delegate, Dr. D. S. Baughman. The following scientific program was presented: "Investments," C. C. Hoaglund, M.D.; "Tumors of the Testicle with the Report of a Case of

Chorion-epithelioma in the Male," D. S. Baughman, M.D.

The regular meeting of the Stutsman Co. Medical Society was held at Trinity Hospital, Jamestown, Feb. 18, 1932. The speaker for the evening was Dr. Fred A. Willius of Mayo Clinic. His subject, "Rheumatic Heart Disease with Special Reference to the Newer Concepts of Rheumatic Fever." Prior to the meeting a delightful dinner was served by the Trinity Hospital Sisters. Among the visitors were Dr. Regan of the State Hospital; Drs. Pray, Moore, Meridith, Emmanuel, Campbell, and Crosby, all of Valley City, N. D.

The second District Medical Society was entertained at Madison, S. D., and officers were elected for the coming year as follows: president, Dr. Magni Davidson, Brookings; vice president, Dr. E. W. Goldman, Madison; secretary, Dr. Ralph Miller, Madison; censors, Dr. L. E. Jordan, Chester, Dr. H. A. Miller, Brookings, and Dr. George Whitson, Madison; and councilor, Dr. C. E. Sherwood, Madison. The ladies auxiliary also elected officers, choosing Mrs. C. E. Sherwood, Madison, as president and Mrs. Henry Tillisch, of Brookings, vice president.

The annual meeting of the North Dakota Academy of Ophthalmology and Oto-laryngology was held June 1st at Grand Forks. Dr. Henry E. Binger, of St. Paul, was the guest speaker, presenting an informative address on "Mastoiditis." Dr. R. O. Griess, of Jamestown, was elected to active membership in the Academy and Dr. Binger to honorary membership. The officers elected for the ensuing year are as follows: President, Dr. Axel Oftedal, Fargo, vice president, Dr. H. O. Ruud, Grand Forks, secretary-treasurer, Dr. F. L. Wicks, Valley City.

Dr. Elmer G. Balsam, secretary of the Medical Association of Montana, has announced the annual state medical meetings will be in Miles City from July 11 to 14. The first two days will be devoted to the session of the Montana Health association and the others to the sessions of the medical body. The Montana Academy of Ophthalmology will convene July 12. Dr. M. G. Danskin of Glendive, president of the health association, will preside at that meeting. Dr. W. J. Marshall, of Missoula, will officiate at the ophthalmologists' meeting and Dr. J. H. Garberson of Miles City, president of the medical association, will have charge of the closing sessions.

An organization of the past internes at St. Mary's Hospital, Minneapolis, has been formed with the idea of getting together once a year. During the 1931 State Medical Meeting they had their first "get together." The staff of St. Mary's Hospital put on a program and the hospital entertained the members of this organization at a dinner. This year the meeting was held May 10th. There were 30 past internes present from out of the city, and with the internes in the city, and staff members, there were 57 present at the dinner. A very interesting program was put on throughout the day and evening. In the morning the staff members put on a clinical demonstration, in the afternoon papers were given by both former internes and staff members, in the evening, the regular staff meeting was held. The success of the two meetings thus far will, no doubt, do much to assure the permanency of this organization.

John Hettwer, 64 years of age, residing at Minneapolis, entered a plea of guilty to practicing medicine without a license at Hastings, Minn., on May 2, 1932, and was sentenced to a term of nine months in the Dakota County Jail. In view of the fact that Hettwer has been in jail since April 20, 1932, the date of his arrest, and because of his age and his signing a statement that he would absolutely refrain from the practice of healing in any way, shape or manner in the future, the court suspended the balance of his sentence and placed the defendant on probation. If any further complaint is made in reference to the defendant, he will have his suspension of sentence revoked and he will be placed in the County Jail at Hastings. Hettwer was arrested on the specific complaint that he treated Mrs. James Danek, South St. Paul, for goitre. Hettwer not only diagnosed her case but prescribed and furnished the medicine for treatment. Hettwer was born and raised in Germany, coming to this country in 1914. He admitted to the Court that he had practiced a little at Melrose, and also at St. Cloud. At the time of his arrest he was hostile and indignant, but at the end of two weeks in jail he cooled down sufficiently to thoroughly digest the warning given him. This is the first prosecution instituted by the Medical Board in Dakota County since the passage of the Basic Science Law, and the warning given the defendant, indicates that the Court intends to deal severely with quacks in that judicial district.

BOOK NOTICE

DIAGNOSIS AND TREATMENT OF BRAIN TUMORS, published by C. V. Mosby Co.; Author, Ernest Sachs, Professor of Clinical Neurological Surgery, Washington Univ.; 381 pages of text; 218 illustrations and 6 colored plates.

The theme of the author is predicated by the following words:

"I have tried in this work to show how a case of brain tumor should be studied."

One who reads the book will realize that the author has succeeded. The chapter on Surgical Anatomy and Physiology is unique and fills a long felt hiatus. The anatomy of the brain has been approached from relation to external landmarks. The color plate with its cover of tracing on transparent paper gives one a visualization of the ventricles and a clear conception of the meningeal vessels. Throughout, the external landmarks are used for a starting point in locating special areas of the brain. The illustration of the ventricles gives one as clear a picture as could be obtained by a full relief model.

The most spectacular feature in the chapter on methods of examination, is a long series of X-ray pictures. All of the important X-ray findings in brain tumor are illustrated. Ventriculography, Auscultation, and Percussion, Pineal Shift are given. All standard methods are discussed fully and with exact detail without superfluous discussion or redundant bibliography.

The chapter on surgical pathology of brain tumors is based to a considerable extent on fundamental work of Bailey and Cushing's, Pinfield, Globes, Cone, Greenfield, Buzzard, Mallory.

Chapter IV., General Symptoms and Signs of Increase Intracranial Pressure.

In Chapter V., Focal Signs and Symptoms of Cerebral Tumors. Localization is simplified by this chapter. Points, important but often neglected, are given.

Chapter VI., Tumors of Pons and Medulla, and Chapter VII., Diseases of Pituitary are excellent.

About fifty pages are devoted to operative treatment. The principles necessary for brain surgery and so often kept in background are clearly set forth. For example, the necessity of making all incisions through the center of a convolution and not in clefts where arteries occur. The clean cut of a scapel does not do the damage resulting from ischaemia secondary to cutting terminal arteries. In ventricular puncture he injects as much as 50 c. c. of air after removing fluid, but removes it as soon as punctures are taken. Irritation of air is apt to follow to complete emptying of ventricle.

As a whole the work is comprehensive, not redundant. It gives one a bird's eye view of an enormous subject. The vastness of the territory has not obliterated essential details. It is a useful book for any doctor. A clear idea by means of description and pictures is given of many structures that otherwise would be obscure to the reader.

J. F. CORBETT, M.D.

A TEXT-BOOK OF CLINICAL NEUROLOGY. By Israel S. Wechsler, M.D., Professor of Clinical Neurology, Columbia University, New York; Attending Neurologist, Neurological Institute and the Montefiore Hospital, New York. Cloth. Price, \$7:00, Pp. 759. Philadelphia and London: W. B. Saunders Company, 1931.

The first edition of this work appeared in 1927. It was reprinted in 1928 and in 1930. Last October the text was revised with particular reference to cephalography, pathology of brain tumors, the epilepsies and chronaxia. There has been some rearrangement of the material. It has been, and still is, the practice of the author to express clinical neurology and omit customary introductory chapters on anatomy and physiology; brief allusion to anatomical and pathological facts, when deemed appropriate, is made for each clinical entity. The second edition contains 29 more pages than the first.

Wechsler's book is practical for student and practitioner.

J. C. MICHAEL, M.D.

CLASSIFIED ADVERTISEMENTS

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Active Physiotherapy practice, good business locality in Minneapolis. Leaving city, would like to make quick disposal. Address Box 914, care of this office.

FOR RENT

Doctor's office in new medical building located in best business intersection of good residential district. Office is exceptionally well equipped. Individual treatment rooms, laboratory, free gas, free compressed air and large reception room. Take advantage of this opportunity. Address Box 907, care of this office.

FOR SALE

\$12,000.00 cash practice in city of 4,500 in western Minnesota. Seventy-five bed public hospital. General practice, good opportunity to do surgery and x-ray work. Practice can be had immediately on the purchase of \$3,000.00 office equipment, which consists of x-ray, physio-therapy equipment and general office furnishings. Fifty per cent discount for immediate sale. Reason for selling, moving to larger city. Address Box 916, care of this office.

LOCUM TENENS POSITION WANTED

Experienced, well qualified physician available any time from July 20th to September 25th. Can furnish car, can speak German. Licensed in Minnesota, Iowa and North Dakota. References. Address Box 917, care of this office.

OFFICE SPACE FOR RENT

Physician's office space available in building located at busy intersection at 240 S. Snelling Ave., St. Paul. Reception room shared with busy dentist. Physician's office recently vacated. Very reasonable rent. Address Capetz Bros., 232½ S. Snelling Ave., St. Paul, Minn.

# THE JOURNAL LANCET

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## Enchondromata of the Lung with Report of a Fatal Case

K. K. SHERWOOD, M.D., and H. H. SHERWOOD, M.D.  
*Kirkland, Wash.*

IN RECENT years, there has been both a relative and an absolute increase in the occurrence of primary tumours of the lung. In spite of this, primary cartilage cell tumours of this organ remain of great rarity. They are usually represented as occurring in the form of small benign encapsulated growths which are found only upon the autopsy table. The case that I wish to report is of especial interest as it did give rise to symptoms and was the immediate cause of death.

In most of the reported cases there is no clear etiological factor; but because, as a rule, they contain all the elements of bronchial structure, Hickey and Simpson<sup>1</sup> believe that they are tumours which arise from embryonic anlage. They are, however, frequently associated with tuberculosis and other authors feel that this may be the stimulating factor which causes their growth. My case had a congenital anomaly in the form of a bicornate uterus; her x-rays show what is undoubtedly a Gohn's tubercule; and her mother has active tuberculosis.

Neither lung is especially apt to be affected. Thus in the 41 cases available, 16 originated in the right lung; 17 in the left; and in 8, the side is not stated. There seems to be a slight preference for the occurrence in the lower lobes, for in the 27 cases in which this is stated, it occurred in the lower lung fields in 17 (63%). Men seem to be more predisposed to this tumour than women, for in 31 cases in which the sex was known, males were affected 24 times, females, 7

times. The age at death was known in 32 instances, in 20 of which it was 51 or over.

Though usually thought to consist of very small tumours of no clinical importance, tables 4 and 5 disprove this. In the 29 cases which were available in sufficient detail to ascertain the cause of death, one third approximately (9 out of 29) were killed by the chondroma in the lung, and in only 10% (3 cases) of the cases in which it was stated, was there any associated active pulmonary pathology. It is of interest that neither tuberculosis nor carcinoma elsewhere are present in any but a very slight percentage of cases.

There are no special symptoms which are pathognomic of this condition. It may be noted, however, that in no case was there observed a rapid development. It is slow growing tumour taking months or years before it is of sufficient size to produce symptoms. The three symptoms which are most frequently complained of by the patient are cough, pain, and dyspnea. The time of the development of each is dependent upon the size and the location of the growth. Thus, tumours near the periphery of the lung will have pain early; those few cases which are near the hilus and occlude the main bronchi by pressure will have the early development of cough and dyspnea. Eventually, as the tumour grows, it distorts by pressure the thoracic contents and frequently gives rise to obstruction of the superior vena cava or its branches. Likewise, pressure upon the sympathetic chain may give rise

to unilateral or bilateral exophthalmos. Inability to swallow may develop as a late symptom, as may oedema of the extremities and ascites (due to pressure upon the inferior vena cava). It is important to remember that only rarely does this tumour metastasize, but that it remains an encapsulated growth that has gradually expanded and either pushed ahead or collapsed all structures in its path.

Radiologically the tumour may or may not be distinctive. If typical, it is situated near the center of one of the lung fields and presents a roughly spherical outline. This shadow is only roughly spherical, however, because of numerous small projections radiating from its periphery; in addition, if a "heavy" film of the chest is made, it may be seen that the mass itself is not homogenous but has islands of greater absorption to x-rays scattered in a matrix of less absorptive material. It is most commonly confused by the radiologist with encysted interlobar empyema, carcinoma of the lung, and echinococcus cyst.

Pathologically, we find a well encapsulated tumour containing islands of cartilage and bone in a fibrous tissue matrix. In spite of progressive growth, mitotic figures are infrequent. Its degree of growth bears a somewhat inverse ratio to cartilaginitation and ossification, the more malignant forms bordering on the sarcoma type.

CASE REPORT: Miss A., age 17, white, first seen May 14th. P.C. pain in lower right chest, anterior and posterior, present for 3 months. F.H.—paternal grandmother died of carcinoma, 2 paternal uncles have large lipomas. Father had severe exophthalmic goitre three years ago, recovered following operation and is now well. Mother has chronic moderately advanced tuberculosis. Two brothers and 1 sister are living and

well. P. H.—Always well up until 2 years ago when she had a mild attack of poliomyelitis. Left leg is still smaller than right, but is functionally almost normal. No history of chronic chest trouble or of pneumonia. This patient probably had no symptoms from the lung tumour until September 17th, which was 4 months after she was first seen. Her chest pain until that time seemed to be related to her gynecological condition; when drainage was present it would be absent; when drainage was absent, it would reappear and be relieved only when the discharge reappeared. The patient dates the beginning of her illness to a fall in February, when the point of a rocker struck her in the vulva. Following this there was bleeding from the vagina for 2 days; no doctor was called. Since this there has been a gradual onset of pain in the lower right chest, anterior and posterior, which has become very severe. On May 14, 2 days after finishing a normal menstrual period, the pain in the chest became so severe that the patient sat up all night.

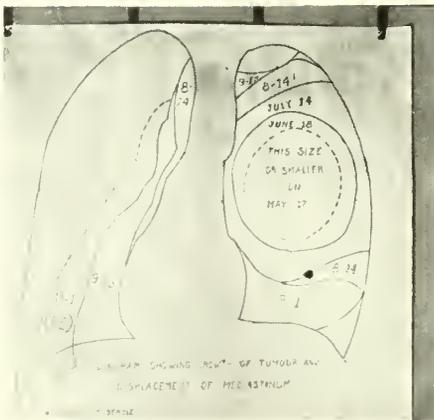


FIGURE I.  
Chart showing rate of growth of tumor.

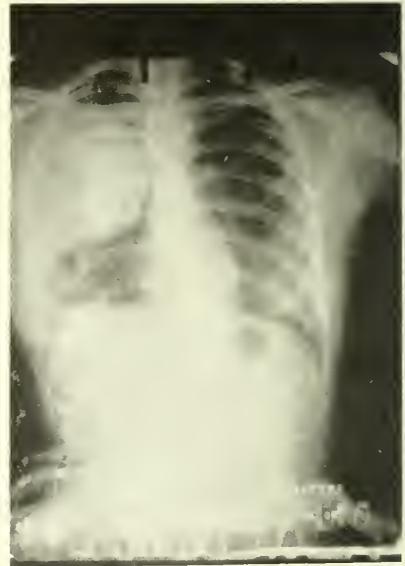


FIGURE II.  
Six foot chest film, showing size of tumor when accidentally discovered.

This pain continued for 36 hours with very little decrease, but was then relieved by the sudden onset of a profuse chocolate colored vaginal discharge. Examination at this time was negative except for this discharge. X-ray of spine to level of dotted circle in figure 1 was negative at this time. Pelvic examination was unsatisfactory. Under ether anaesthetic on May 27th, an abscess in the cervix uteri was drained vaginally and a bicornate uterus was discovered (by abdominal

incision). The patient made a stormy post-operative recovery, having rather typical pleurisy pain for one day, but was up and around and apparently well by the middle of June. Because of persistence of pain and dullness in the right chest, she was plated at this time, with findings as shown in Figure (2), and because of the entire absence of chest symptoms, other than a pain which varied with the drainage from the cervix, and a lack of sepsis, it was decided to watch this mass for a time. By July 12, one was able



FIGURE III.

Low power magnification of biopsy section: cartilage and bone on right, fibrous matrix on left.

to demonstrate unmistakable enlargement. On the 14th under local anaesthesia, a thoracentesis was attempted. Nothing but a few drops of blood was obtained. X-rays were taken which demonstrated conclusively that the needle was in the mass. Examination of the blood after staining did not reveal any tumour cells. After some delay, permission was obtained for an exploratory operation and evacuation of pus if found, but not for a lobectomy. This was performed on July 17th by Dr. J. Tate Mason. A posterior approach was made by means of lifting the scapula forward and 3 ribs were resected. A very hard mass the size of a muskmelon was found. This was not attached to either the parietal pleura or to the ribs by any but the weakest of adhesions. This mass was cartilagenous to the touch. It

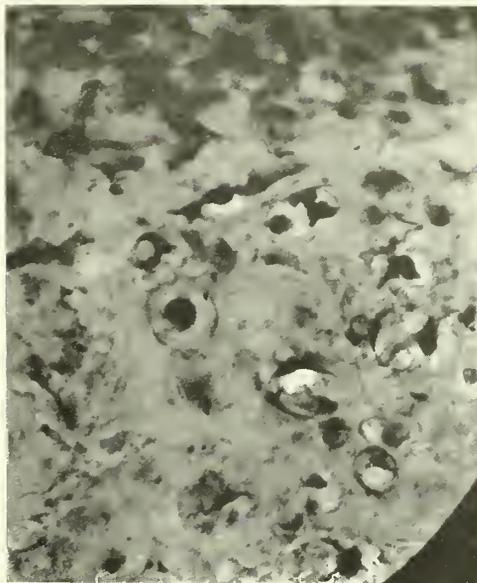


FIGURE IV.

High power magnification of biopsy specimen, largely cartilage, with fibrous tissue, at extreme right. A mitotic figure may be seen in the right center.

was very thoroughly needled by Dr. Mason using both small and large trocars, and it seemed to consist of numerous islands of dense fibrous tissue and cartilage separated by small areas of less dense tissue. A rather large biopsy was taken from a grossly typical portion of the tumour and the incision was closed. Again there occurred a rather stormy convalescence but after three weeks the patient was strong enough to start a series of deep therapy treatments (August 7th to 11th) given by Dr. M. F. Dwyer.\* These seem to have absolutely no effect upon the tumour, which continued to grow. On September 17th, cough was noticed. At this time there was no dyspnea in performing ordinary tasks. On September 28th there was first noticed a moderate amount of blood streaked sputum, with a continuation of the cough and the beginning of pain in the right chest, not associated with the pelvic condition. On October 7th, malaise had made its appearance, other symptoms continuing. Codein was necessary for the relief of pain. On November 2nd, the pain had become so severe that morphine was started. Malaise and dyspnea were so pronounced now that the patient was only able to walk a few steps. Beginning exophthalmos was noted on the 2nd, and by November 12th the exophthalmos was marked, there was some cynosis of the lips, the external jugulars were

\*Treatment consisted of 300 milliampere minutes at 145 kilovolts, filtered by  $\frac{1}{4}$  mm. of copper and 1 m. of aluminum, with tube at distance of 16 inches, given through two positions, anterior-posterior and posterior-anterior, centering upon the mass.

TABLE I.

DISTRIBUTION OF LUNGS	
Lung Unknown	8
Right Lung	16
Upper Lobe	5
Middle Lobe	2
Lower Lobe	7
Lobe Not Stated	2
Left Lung	17
Upper Lobe	3
Lower Lobe	10
Not Stated	4
Lobes Stated in	27
Lower Lobe	17
Upper Lobe	16

TABLE II.

SEX DISTRIBUTION	
Males	24
Females	7
Not Stated	10

TABLE III.

DISTRIBUTION BY DECADES	
Age Not Stated	9
From 1 to 10 Years	1
From 10 to 20 Years	2
From 21 to 30 Years	3
From 31 to 40 Years	3
From 41 to 50 Years	3
From 51 to 60 Years	8
From 61 to 70 Years	10
Over 70	2

TABLE IV.

ASSOCIATED LUNG DISEASE	
Not Stated	7
None	29
Bronchitis	2
Bronchiectasis	1
Anthracois	1
Tuberculosis	1

TABLE V.

CAUSE OF DEATH	
Unknown or Not Stated	12
Enchondroma	9
Other Causes	20
Anthracois	1
Carc. of Prostate	1
Carc. of Stomach	2
Chr. Valv. Dis. of Hrt.	2
Cirrhosis	1
Cor. Art. Sclerosis	1
Del. Tremens	1
Diabetes	2
Injuries	2
Myocard. Insuff.	1
Osteomyelitis	1
Pur. Bronchitis	1
Uremia	1
Senility	2
Tuberculosis	1

engorged, the patient complained of dysphagia and abdominal distension. The apex beat was

in the left anterior auxiliary lung, the anterior abdominal veins were engorged, ascites of 2 plus, palpable liver and spleen, and 1 plus oedema of the feet. The patient was using 3 grains of morphine a day for the relief of pain. On the 16th she was unable to get out of her chair. On the 18th the right arm was moderately edematous. She died on November 27th, presumably from circulatory embarrassment. No autopsy was obtained.

This case, one might say, is a classical case of enchondroma of the lung in a relatively high degree of malignancy. It occurred at the age of adolescence in an individual who had a congenital anomaly of the uterus, though the factor of tuberculosis can not be ruled out. It was asymptomatic until very late in its course. Treatment by X-ray was entirely without effect. Death came as a result of exhaustion especially of the heart, and there were no demonstrable metastatic growths.

## CONCLUSION

1. Enchondroma is probably not nearly as rare as a search of the literature would lead one to suppose.
2. The tumour is usually centrally located and is asymptomatic until it reaches relatively huge proportions.
3. Contrary to general opinion, a study of 41 cases revealed that in 9, at least, it was not merely an accidental finding at necropsy, but the primary cause of death.
4. On account of its high cartilagenous content, radiation therapy is of little or no use. Treatment should be that of its complete removal.
5. Metastases seldom, if ever, occur.
6. A very typical case is reported.

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## The Treatment of Pyelitis in Pregnancy

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WHEN a patient in pregnancy has the misfortune to acquire a complicating pyelitis, her condition is serious. It is serious because of the immediate disability produced in the mother; because of the frequent deleterious effect on the fetus; and because of

the manifold possibilities for permanent renal damage in the mother long after the puerperium.

It was formerly believed that pyelitis in pregnancy was more or less a self-limited disease and that it disappeared in the puerperium. An increased experience with this disease in pregnancy

has led us to the positive conclusion that such a belief is erroneous and dangerous. While it is undoubtedly true that the clinical and laboratory evidence of pyelitis often disappears after delivery, the fact remains that numerous patients with this disease will present definite evidence of renal infection long after the puerperium, if adequate treatment has not been given during pregnancy. So thoroughly has this been impressed upon us that we now regard a patient suffering with pyelitis in pregnancy as a patient who should have the attention of the urologist as well as the obstetrician. In fact, successful treatment is largely a urologic problem.

The prophylaxis of pyelitis in pregnancy is the prophylaxis afforded by careful pre-natal care with special emphasis laid upon the eradication of oral sepsis, foci of infection in tonsils, accessory sinuses and constipation. Abscessed teeth and infected tonsils are of greater etiologic significance in this regard than is commonly recognized, both because of their direct focal danger and because of the intestinal stasis which they may indirectly engender. Constipation is treated best by a diet consisting chiefly of vegetables and fruit, by drinking at least eight glasses of water daily, and by the occasional use of a vegetable or saline laxative.

In our experience, pyelitis usually begins to produce symptoms about the fourth month of pregnancy. One should not be deterred from attempting the removal of foci of infection at that time, if they have not been removed earlier, just because of the slight increased risk of causing abortion. The risk of disturbing the pregnancy is far less than the risk of letting such foci remain to destroy the effectiveness of active treatment of the pyelitis.

Once the diagnosis of pyelitis in pregnancy has been definitely established, the treatment divides itself into two phases: (1) medical management and (2) urologic treatment. The tendency has been too much toward the former to the neglect of the latter.

Medical management should consist of the following: (1) Identification of the infecting organism by urine culture and a daily examination of the urine for control of treatment; (2) Regulation of the diet and the ingestion of adequate amounts of plain or alkalized water daily; (3) Free but gentle catharsis; (4) A definite plan of alkalizing the urine; (5) The use of sedatives, as necessary, to control pain and insure sleep.

Most of the cases of pyelitis in pregnancy will

be found to have an acid urine in which colon bacilli are grown in almost pure culture. It must be remembered, however, that staphylococci, streptococci and tubercle bacilli are found at times and that the etiologic organism will influence the type of treatment employed.

Urinary antiseptics have a place, though one of exaggerated importance, in the treatment of this condition. We were led to expect too much from the newer antiseptics. They have a place but not to the exclusion of the older drug, hexamethylamin. One advantage that the newer urinary antiseptics have over hexamethylamin is that they are effective in alkaline urine.

If, at the end of a week's treatment with alkalis, the urine shows a decided improvement, it is sometimes well to use one of the urinary antiseptics for a few days and carefully watch the results. However, a week or ten days is adequate time in which to employ medical treatment. If the clinical and laboratory evidence of improvement is not definite, it is time to begin the second phase of treatment, the direct urologic treatment.

The treatment of pyelitis in pregnancy by the cystoscopic method is not materially different from the treatment of this condition where it does not complicate pregnancy.

Alteration of bladder contour, due to pressure of the uterus, especially in the later months, frequently calls for slight changes in technique. Aside from this, the procedure is the same as in routine cystoscopic examination.

Special care should be taken to avoid discomfort to the patient. An hour before treatment a sedative is administered.

After the patient is placed in position, surface anesthesia is applied to the urethra and the base of the bladder. The cystoscope is then introduced and the bladder inspected for evidence of pathology in this viscus. Ureteral catheters are then passed to the kidney pelvis and urine collected from each kidney. A few drops of urine from each catheter are placed on separate, marked slides and immediately examined for pus. This is found in most cases coming from the right pelvis. Occasionally the disease is bilateral.

The capacity of the inflamed kidney pelvis is then determined and this is followed by lavage with sterile water to the capacity of the pelvis. When the water is drawn off, 5 c.c. of 1 per cent solution of silver nitrate is injected and allowed to drain through the catheter. Large-sized catheters are used for this purpose to facili-

tate drainage. The catheter is left in the ureter up to six hours but is removed at any time drainage ceases, or if it causes discomfort.

The establishment of proper drainage is very important, since infection does not easily take place in a kidney pelvis with good drainage.

Medical treatment continues as outlined. If the symptoms recur or have not abated, the lavage is repeated in one week.

With this plan of treatment we have found a

marked reduction in the number of patients upon whom obstetric interference was necessary. Nevertheless there will be an occasional patient who will not yield to treatment until the pregnancy is terminated.

Patients who have had pyelitis complicating pregnancy should be kept under observation for a considerable time following the puerperium so that any infection remaining in the urinary tract may be treated.

## Cretinism and Hypothyroidism

Report of a Case of Sporadic Cretinism Coming to Autopsy at Two Months of Age\*

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THE infrequency of reports of hypothyroidism with autopsy findings in infancy seems to justify the reporting of the following case:

A full-term, white, male infant weighing 4.6 kilograms was born following normal delivery. The first few days of the neo-natal period were uneventful aside from the appearance of a definite icterus. At the age of five weeks, when first examined by one of us (E. S. P.), the baby showed jaundice and definite evidence of under-nutrition, the weight now being 3.8 kilograms. The father and paternal grandmother were said to be bleeders, and one paternal grandparent died of Addison's disease. There was moderate dehydration, rather intense jaundice and weakness. The hemoglobin was 122 per cent, the red blood cells 5,030,000, white blood cells, 5,050, p.m.n.'s 38 per cent, lymphocytes 54 per cent, eosinophiles 6 per cent and monocytes 2 per cent. Schick, Mantoux, urine and Wassermann were negative and the temperature was 99.4 degrees. At this time laboratory studies revealed the jaundice to be of the non-obstructive type. Certain cretinoid facial characteristics were noted.

The infant was admitted to the University Hospital, where it gained nicely on complementary feedings, and the jaundice gradually cleared up, but the cretinoid features became more pronounced. While in the hospital the baby developed an acute rhinitis, which, in association with an increasing macroglossia, gave rise to progressive respiratory difficulty. X-rays of the long bones revealed a definite delay in ossification of the

epiphyseal centers, consistent with that usually noted in hypothyroidism. A determination of the basal metabolic rate by means of the insensible weight-loss method was attempted, but lack of proper scales for this made the test unreliable. Thyroid therapy was instituted, without metabolism determination, ten grains of thyroidea sicca being given daily. When the baby had reached the age of seven weeks, the jaundice had completely disappeared and the body weight was increasing satisfactorily. Occasional fever, regurgitation and abdominal distention, however, became more and more troublesome, cyanotic attacks occurred at intervals, and at the age of two months the baby died suddenly in one of these attacks.

The following is the report of the findings at autopsy (negative findings are omitted):

The body is that of a white, male infant weighing 4,520 grams. The crown rump measurement is 42 cm., the crown heel is 61 cm. Rigor is present. Hypostasis is purplish and posterior. There is a diffuse edema of the entire body which does not pit on pressure. The skin is shiny, and there is no cyanosis nor jaundice. The lips are thickened and gaping with a thick tongue protruding between them. (Figure 1). The nose is slightly broadened, and the head is covered with a profuse growth of dry, red hair. The anterior fontanelle measures 3 cm. in diameter and the metopic suture is open, extending down into the forehead. There is a marked prominence of the abdomen.

When the body cavity is opened, a peculiar

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kind of edema is seen, but no subcutaneous fluid escapes on pressure. The skin, subcutaneous tissue, and even the muscles have a gelatinous, thickened appearance. When the tissues are reflected from the chest wall, the exposed surface has a peculiar nodular, lobulated, glistening appearance. The liver is very large, extending 5 cm. below the costal margin. The stomach is greatly distended, and the small intestine is prom-

The ductus arteriosus is closed. The right lung weighs 55 grams, the left 45 grams. There is a small subpleural hemorrhage in the medial border of the right upper lobe, and in the anterior surface of the lower portion of the left upper lobe. The purple-red spleen weighs 16 grams and is slightly adherent to the lateral abdominal wall by recently formed, fairly firm adhesions. The surfaces made by cutting evert.

The pulp is dark bluish-red and firm. The liver weighs 270 grams. The surface is glistening and slightly mottled. The surfaces made by cutting evert, and have the same gelatinous appearance as seen elsewhere. The gastro-intestinal tract is



Fig. 1. Photograph taken about ten days before death, showing the typical cretinoid appearance. Note the shiny skin which does not wrinkle, the pig-like eyes, the low forehead, the broad nose, and the large tongue and lips.

inent. The walls of the intestinal tract are markedly thickened. The diaphragm is at the fifth rib on both sides and is also markedly thickened. (Figure 2). The parietal pleura shows the same thickening as is seen elsewhere. The heart weighs 40 grams. The chambers appear enlarged, but not dilated. There is a small patch of subepicardial hemorrhage present in the right lateral border. The foramen ovale is patent.



Fig. 2. Trachea and larynx, showing absence of thyroid. Below is (A) a section of the diaphragm of the cretin to compare the thickness with (B) a section taken from a corresponding area in a man weighing 190 pounds.

pale and thickened. There are postmortem changes in the mucous membranes. The upper portion of the lesser curvature of the stomach contains an eroded area which resembles postmortem change. However, outside of this there is an area which suggests partially organized exudate. The stomach is adherent by fine adhesions to the under surface of the liver, but is separated without very much difficulty. The pancreas is normal. The adrenals weigh 9 grams each, and show softening and congestion in the medulla. The right kidney weighs 30 grams; the left 35 grams. The capsules strip easily, exposing lobulated surfaces.

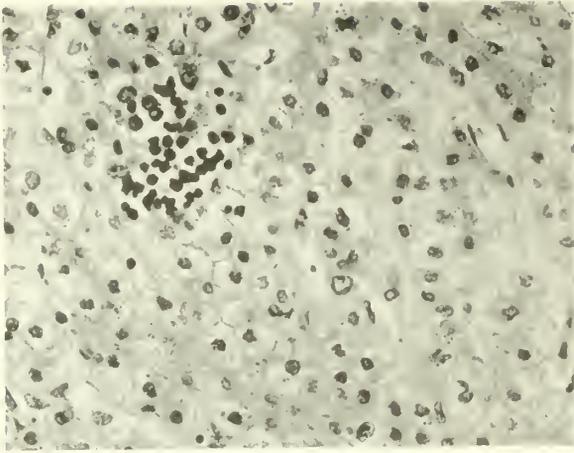


Fig. 3. Section of the liver, showing the clear cytoplasm of the cells and a blood island.

One section they have an appearance similar to that seen in the liver. The external genitalia are normal except for the myxedematous change. The thymic body is atrophic and weighs 5 grams. The muscles of the neck show myxedema. The thyroid gland is searched for, but the structure cannot be identified. There is a small amount of fat and reddened tissue over the cartilage in the region of the thyroid gland. This tissue, the trachea, and the thyroid cartilage are removed intact for further examination. (Figure 2). There is no evidence of cysts or anomalous thyroid tissue in the neck. The thickened tongue is pushed backwards and the base of the tongue removed from below for study. There is no gross evidence of thyroid tissue in the tongue.

Both paraffin and frozen sections are examined under the microscope. The liver cells have a clear cytoplasm and probably contain glycogen. There are numerous blood islands scattered



Fig. 4. Section of the voluntary muscle, showing a vacuolar appearance between the fibers.

through the parenchyma. (Figure 3). The spleen also contains many blood islands. The cells of the adrenals are clear. The medullary sinuses are engorged with red blood cells. The thymus shows typical sclerotic atrophy. Marked atelectasis is found in the lungs. There are a few small focal areas of round-cell infiltration in the stomach wall. There is slight postmortem erosion of the mucosa in places. There are abnormal findings in the kidneys, prostate, or bladder. Sections of the voluntary muscle shows accumulation of fat cells between the fibers. (Figure 4). The cardiac muscle shows no marked change.

#### Diagnosis:

1. Congenital cretinism with myxedema (clinical).
2. Aplasia of the thyroid.
3. Marked myxedema of soft tissues, diaphragm, and intestinal tract.
4. Macroglossia (edematous enlargement).
5. Sclerotic atrophy of the thymus.
6. Hemorrhages of the pleura and epicardium.
7. Slight localized peritonitis along the lesser curvature of the stomach.
8. Recent adhesions of the stomach and liver.
9. Fetal lobulation of the kidneys.

A study of the literature on cretinism and hypothyroidism brings out the following points of interest:

*Types*—There are two types of cretins:<sup>1</sup> The *endemic* cretins are those who have an enlarged thyroid of the adenomatous type. The tissue between the adenomas is largely fibrous. The acini in the adenomas show atrophy and degeneration. These individuals are less defective physically and mentally than sporadic cretins but they do not respond as well to treatment as the latter.<sup>2</sup> In *sporadic* cretins the thyroid gland is usually atrophic or absent.

*Symptoms and signs*—According to Talbot,<sup>2</sup> evidences of cretinism are said to appear first in the second half of the first year of life. It may be that the condition is already present before this but is not recognized. Occasionally manifestations of thyroid deficiency are observed at birth, but in most cases are not recognized until about the eighth or tenth week of life. Symptoms are said<sup>3</sup> not to appear, or do not develop completely as long as the infants nurse, as sufficient thyroid secretions seem to reach them through the mother's milk. The very early symptoms and signs include sparseness, but not coarseness, of the hair, some thickening of the subcutaneous tissues, abnormal quietness of the infant, a suggestion of cretinoid facies, and a slight hoarseness

of the voice. In the second or third month the tongue is large and thick and may fill the mouth and interfere with nursing, the thickening of the subcutaneous tissues is more marked, the hoarseness increases, the outer ends of the eyebrows are scanty or absent, the eyes are far apart and have a pig-like expression, the sclera is bluish white, there is a definite lemon-yellow tint to the cheeks near the alae nasi, and the body feels cold. After the fourth month there is a marked simple anemia. The relatives feel that there is nothing wrong. The baby seldom laughs.

After the sixth month there is a retardation of growth and an intensification of the early symptoms; the arms and legs remain relatively short, the head large and the trunk long; ossification is slow; the fontanelle may remain open until eight years of age; the forehead is low and wrinkled when the eyes are open; the nose is broad and has a wide flat bridge; dentition is delayed; the lips are thick and not held together; the myxedematous tissues make the neck appear short; the abdomen is protuberant; an umbilical hernia is almost always present; the skin is pale, dry and coarse; eczema is common; there is a striking lack of mental development; the infant is sluggish, quiet, and docile unless teased; speech is delayed and the vocabulary limited and an electrocardiogram shows the T-wave characteristically low (1 mm. high or less), flat, or inverted. The basal metabolism is lower than in any other disease; it may fall to 40 per cent below normal. Before the third month the depression may be very slight. Malnutrition may raise the rate of metabolism.

*Aids in diagnosis*—Failure to make the diagnosis early is a serious omission, as prompt treatment offers the best opportunity for mental growth. Tests used as aid in difficult cases are: Basal metabolism, electrocardiogram, failure of "edema" to pit on pressure, glucose-tolerance test (which is high), the adrenalin test, and X-rays of the skeletal system.

*Differential diagnosis*—While a diagnosis usually is made easily when the above symptoms and signs are present, there are times, as in the early period of the case reported, when one is far from certain as to the correct diagnosis. As pointed out by Talbot,<sup>2</sup> mongoloids may resemble cretins in the early onset and retardation of growth, the stupid facial expression, and the protruding tongue. Furthermore, according to Lucas<sup>3</sup> mongols often have a lowered basal metabolic rate, which, however, is not primarily the result of

thyroid deficiency. The differences in the two conditions are brought out in the table:

	MONGOLOIDS	CRETINS
Head	Small, round, flattened posteriorly.	Large, brachycephalic.
Eyes	Oriental slant.	No oriental slant.
Nose	Button-like.	Retracted at base with flaring nostrils.
Tongue	Small and pointed.	Large and broad.
Neck	Normal in length.	Shortened.
Thyroid	Normal size.	Small or not palpable.
Hands	Slender with tapering fingers and incurved little fingers.	Spade-like and plump with straight fingers.
Bony Development	Less pronounced or normal.	Delayed.
Dentition	Less pronounced or normal.	Delayed.
Hair	Normal.	Scanty, brittle, and dry.
Skin	Normal.	Coarse, frequently thickened, dry, cold, cyanotic, and hairless.

*True infantilism* is distinguished by its mere arrest of development of the organism at an early stage. The psyche, skeleton, and soft tissues are normal for an age younger than the age of the child suffering from infantilism. The pathological changes of hypothyroidism are absent.

*Congenital idiocy* merely resembles cretinism in the mental sphere. Findings such as spasticity or paralysis of the limbs and disturbances of the reflexes readily distinguish it.

*True dwarfism* is distinguished by the regular, progressive, symmetrical development of the skeleton and the soft parts, which do not reach the normal limits of adult size and stature. No cretinoid features are present.

*Rickets*, while usually not confusing, may be distinguished by X-ray studies showing the hypertrophic rachitic changes in contrast to the delayed ossification of the cretin's skeleton. The osseous changes are considered in more detail below.

*Chondrodystrophy*, characterized by delayed development of cartilaginous ossification centers, resembles hypothyroidism only in the dwarfism. Here, too, roentgenological studies will readily clear up the doubtful cases.

*Metabolic studies*—Studies by Magnus Levy<sup>4</sup> show that cretins absorb less oxygen and produce less carbon dioxide than normal individuals. The basal metabolic rate is depressed according to the severity of clinical symptoms. It may go to minus-forty in complete loss of function of the thyroid. It may be much lower than the clinical symptoms would suggest, and thus may be of diagnostic value. A nitrogen metabolism study (Janney and Isaacson)<sup>5</sup> shows low nitrogen excretion. Urea, ammonia, creatinine, and phosphates are present in the urine in normal relationship to nitrogen. The purines are much de-

creased. The abnormal presence of creatinine is remarkable.

Experiments by Janney (quoted by Barker) show that food is judged by nitrogen excretion is as rapidly absorbed and eliminated by thyroidless individuals as by normal individuals.<sup>6</sup> The reduced nitrogenous and basal metabolism of the cretin may be an expression of a compensatory and sparing reaction of the organism, since the chief function of the thyroid is the control of growth and regeneration of tissues. As normal metabolic repair and regenerative processes cannot be properly carried out because of thyroid deficiency, the destructive processes are inhibited, with a consequent decrease in elimination of total nitrogen, purines, and a fall in the gaseous exchange. Cretins take less food than do normal children as they cannot properly assimilate it.

*Osseous Changes*—Engelbach and MacMahon<sup>7</sup> (1924) demonstrated the value of X-ray examination for retarded skeletal development in early hypothyroidism, and established it as a pathognomonic sign. As many children with cretinism or myxedema do not show classical evidences, the value of this sign should be emphasized. Shelton<sup>8</sup> (1930) restudied this problem, using as normals children who showed no signs of abnormality. They were studied on their birthdays to get the exact age. His conclusions were that all observers (with the exception of Poland in an old report) show a remarkable accord as to the time of the appearance of the ossification centers during, first, the infantile period (1-5 years).

The distal epiphysis of the femur, the proximal epiphysis of the tibia, together with the talus, the cuboid, and the calcaneus should be ossified at birth. Absence of nuclei in the knee and the ankle point to a retardation of osseous development during the intra-uterine period, prematurity excepted. Experiments by Allen on the thyroid anlage in tadpoles indicate that the thyroid produces a hormone of tissue-differentiation rather than of growth. Many cretins with a slight modification of stature show a markedly retarded differentiation of somatic tissue. The absence of one or more of these nuclei at birth is an early and a recognizable sign of hypothyroidism, and is of value when basal metabolic tests cannot be made. True mongolism, birth injuries and other forms of mental deficiency do not consistently retard the unfolding of the osseous system except when hypothyroidism is a complication. Hypergenitalism of obscure etiology is always ac-

companied by a rapid unfolding of the osseous system with an early closure of the epiphyses.

Second, in juveniles (6-12 years) there are additional osseous centers and a beginning of union, particularly between the ischium and the pubis, and between the trochlea and the capitulum. The greater the age, the greater is the variation of the findings of the authorities. Sex plays an important role in that the female tends to be slightly in advance of the male. The differences should therefore be brought out in reporting a series.

No great difference occurs until about the thirteenth birthday. A study of a group of students in a private school for girls in California showed that 80 per cent of those free from endocrine disturbances menstruated first between the twelfth and fourteenth birthday at an average age of thirteen years. This is slightly in advance of the general average in the United States. It is difficult to determine an exact time of male adolescence. Seventy per cent of a group of students developed secondary sex characteristics, or their first spontaneous ejaculation, between the ages of fourteen and sixteen, average fifteen. Ninety per cent of the remainder came within six months of these limits. An early closure of the epiphysis indicates a hyperactivity of the genital hormones and of the anterior lobe of the hypophysis. There is an associated hypergonadism, early menstruation, behavioristic problems, and cessation of growth. If growth hormones predominate, potential gigantism results.

#### TREATMENT OF HYPOTHYROIDISM

Some of the most brilliant results in medicine follow the judicious administration of thyroid preparations. However, results are not always as perfect as indicated in most text-books. Frequently growth is retarded, and it is seldom that all the signs of hypothyroidism entirely disappear. The results depend on 1, the amount of permanent structural change that has already taken place, 2, the adequacy of the dosage, and, 3, the activity of the thyroid preparations used. Thyroid preparations may have to be taken throughout life. Some patients recover without much treatment (apparently the gland undergoes regeneration).

In the usual case the dosage of thyroxin varies from 0.1 to 0.8 milligrams daily. The dosage should be decreased when slight nervousness, tachycardia or precordial oppression ensues. In children normal growth is the result to be sought and to facilitate this a height, weight and dosage chart should be kept. Overdosage prevents growth

quickly, and this may be the only sign of overdosage. Other signs of overdosage are rise of temperature, flushed face, tremor, and nausea and vomiting. The metabolic rate is the best known control of thyroid therapy. In a few weeks at the most, the rate will rise to normal. The dose is then reduced, and the patient is observed at regular intervals to maintain metabolism at normal by variation and dosage.

While thyroid implantations have been attempted, no lasting results have been obtained.

#### SUMMARY

1. Sporadic cretinism is due to aplasia or hypoplasia of the thyroid gland.

2. The disease is frequently manifested in the second half of the first year, but may be present at birth.

3. Atypical forms are probably more frequent than those showing the typical text-book pictures.

4. The differential diagnosis may be difficult.

5. Basal metabolism may be lower than the general appearance suggests.

6. Failure of osseous "unfolding" as demon-

strated by X-ray is the most reliable sign until puberty.

(a) Sex differences should be noted in adolescents.

(b) Other secretions, such as those from the pituitary and gonads, may influence the osseous system.

7. The results of treatment vary. They seldom are perfect. The gland may partially regenerate.

8. The usual dose of thyroxin is 0.1 to 0.8 mgm. daily. Normal growth is the effect sought. Early and persistent medication is desirable. Thyroid implantation is unsatisfactory.

We wish to thank Dr. E. T. Bell, Dr. Wm. A. O'Brien, and Dr. Irvine McQuarrie for their interest and suggestions in the reporting of the case study.

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## Medical Aspects of the Diagnosis and Treatment of the Menopause\*

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THE manifestations of the menopause are so varied in type that one is tempted to attribute to the climacteric any complaint without obvious cause which is made by a woman in the fifth or sixth decades. Such diagnosis by inference may overlook other organic disease. At the other extreme is the failure of many clinicians to recognize the way in which the menopause may simulate such diseases as thyrotoxicosis, degenerative processes in the central nervous system, gastro-intestinal disease or skin troubles. This confusion has led to surgical approach with poor success and to commitment to sanatoria unnecessarily. The diagnostic difficulty can best be shown by the citation of cases. These are typical of three fairly well defined varieties of the climacteric.<sup>1, 2, 3</sup>

#### TYPICAL CASES

The first is a "simple" case. Mrs. Z., aged 56, had been obese for many years. For 6 years

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she had experienced frequent hot flashes. She complained of general pruritis and of formication on her arms. Insomnia was very bothersome and made her work a burden, since she had to support herself as a cook. Moderate but variable hypertension was found. Physical examination was of no significance aside from the obesity. This group of symptoms was completely relieved, except for the obesity and hypertension, within a few days after the beginning of the treatment to be described later. This patient is an example of the condition frequently encountered in women who are otherwise well at the period from 40 to 55 years. Most commonly such women ask for attention only when there are other matters which lead them to the physician. There seems to be an assumption that these menopausal symptoms must be borne as a part of the lot of woman.

A second type of disturbance is illustrated by the case of Mrs. G., aged 55. Her physician referred her for treatment because of suspected

thyrotoxicosis. Her goitre had been evident for 15 years; marked further growth occurred within the six months before she was seen. Her symptoms included nervousness, tremor of the hands, sweating, loss of 25 pounds, poor appetite, weakness, and a warm feeling. She had dyspnea and palpitation on exertion. Edema had been noted for 10 years. The gastro-intestinal history was rather indefinite, but the dyspepsia suggested either a chronic gall bladder infection or a chronic colitis. Menstruation had stopped 5 years before, at the age of 50. Hot flashes were recognized, and anesthasias and paresthasias of the hands were experienced. The physical examination of this woman showed obesity in spite of the weight loss. There were no eye signs of a hyperactive thyroid. The goitre was nodular. Heart examination showed extrasystoles and blood pressure 140/75. The colon was tender. There was a tremor of the fingers. The feet were moist, but cold. The basal rate was only 8 per cent above the normal. In spite of the very suggestive history and the opinion of the family physician, this patient was not operated upon; but she was relieved so largely by the use of follicular therapy that she refused surgical treatment. This relief included all the symptomatic evidence of thyrotoxicosis and of dyspepsia. It became evident that the goitre was not mechanically a cause of the dyspnea. Cosmetic and prophylactic considerations did not persuade the patient to allow the thyroidectomy.

A third case summary will serve to illustrate the problem as it is presented to the psychiatrist, and frequently to the family physician. Mrs. S. noted beginning irregularity of menses at the age of 43. Her family was very much concerned about her mental condition because of failing memory, continuous worrying, and despondency with suggestions of self-destruction. She was working as a telephone operator, and her changing mental attitude made it seem that she would have to stop the work which helped support the family. Inquiry showed that she noted vertigo, weakness, hot flashes, paresthasias, and was much troubled with insomnia which had not previously been a problem. This woman was given small doses of folliculin by injection, and noted improvement at once. After two months it was found possible to discontinue the treatment entirely. Menses became regular again and no treatment has been needed for 9 months. The patient considers herself completely relieved. There is reason to believe that she will again re-

quire assistance when the menopause once more begins to cause symptoms.

#### DIFFERENTIAL DIAGNOSIS

These three cases are given in some detail in order to illustrate the three types of menopausal disturbance which are rather frequent. Obviously there are many other varieties of response to the metabolic change which occurs usually in the 5th decade. If the commoner types are recognized and the possibility of varied clinical pictures is kept in mind both diagnosis and treatment will become simpler. These types might be called the simple vasomotor, the pseudo-thyrotoxic, and the involutinal varieties of climacteric. The hot flashes, paresthasias, and insomnia are the commonest manifestations of the first type. These symptoms are usually present in all types of menopausal syndromes. It may be suggested that these types are really the various results of a single fundamental process which occurs in women whose central and peripheral nervous systems vary in their stability or sensitivity to metabolic changes.

In addition to these common symptoms, the pseudo-thyrotoxic patients complain of exaggerated heat sensitivity, tremors, emotional instability, dyspnea and palpitation. The differentiation from true thyroid disease is to be made in three ways. The history of details in these complaints will often give the clue, especially if the physician keeps the menopausal possibilities in mind. The recurrence of brief periods of hot and cold sensations is contrasted with the more uniform warm feeling of the thyrotoxic patient. The emotional instability is usually in the depressed phase, and does not include the elation and enthusiasm recognized in the hyperthyroid states. The palpitation is often not accompanied by tachycardia, as it is in cases with elevated metabolic rates. When these details do not clearly make a diagnosis possible, the physical examination may help. If that is still equivocal, the basal metabolic rate is, of course, of great importance. But even a single test of basal metabolism may show a moderate elevation of rate, due to the patient's emotional disturbance and her inability to relax completely. If the suspicion of a menopausal basis for the complaints persists, a therapeutic trial of folliculin should be used. This does not prejudice the future treatment if thyroid disease is found to be the cause of the trouble. The question can be decided in a week in this way, and it may avoid a thyroidectomy and prolonged hospitalization.

In the involucional cases these evidences of a disturbed vegetative nervous system are less obvious than are the despondency, the sense of inadequacy, and the morbid ideas of suicidal type. Most of these women have learned by years of experience not to complain of subjective difficulties. The psychotic problem is therefore elicited only by consciously directed questions. By careful and gradual approach it is usually possible to detect despondency and morbid thinking about self destruction before direct questions are put. It has seemed that conscious vocalization of these thoughts relieved patients of a dread. The assurance that such a process was not only a common but also a temporary phenomenon has been an important item in the mental relief afforded the patient. Frank discussion and explanation of the organic basis for the mental problems of the climacteric is one of the most important features of the physician's responsibility to these patients. In applying the therapeutic test to confirm the diagnosis here, patience is required. Improvement is sometimes not recognized for a number of days, or even a few weeks. The family can often see the change before the patient will admit that she is better.

#### FREQUENCY OF SYMPTOMS

The frequency of certain symptoms needs emphasis. Paresthesias occurred in half the patients. Hot flashes were almost always present. Occasionally they were reported as chills, a matter of emphasis on the more uncomfortable part of the cyclic change. These vasomotor disturbances may occur at intervals of a few minutes, but more commonly every few hours. Sometimes days or weeks intervene between the hot flashes. Insomnia was marked in over half of the patients seen.

Obesity was not as common as thought, found perhaps in half the women seen. In some cases obesity existed before the menopause. Likewise hypertension was not by any means constant, being found in perhaps a third. The thyrotoxic type of disturbance is relatively uncommon in a general practice. It may be considered as a disturbance occurring in a sensitive and emotional personality in the same sense as Grave's disease, discussed by Moschcowitz.<sup>4</sup>

The frequency with which the mild involucional changes are met is not determined; but the impression is that these occur in at least half of the women who pass through the menopause. These mental phenomena have been observed in a few women in the fourth decade, and the diagnosis has been made fairly certain by the use of

the same psychotherapy and folliculin treatment employed with like success in the more typical cases in the fifth and sixth decades. Such premature cases may be termed ovarian deficiency rather than true menopause. Physiologically the process is about the same.

#### HORMONE PREPARATIONS

The hormone of the Graafian follicle has been available for clinical use for about 4 years, and has been on the market as amniotin (Squibb) for nearly that long. More recently theelin (Parke, Davis & Co.) has been marketed. The German progynon (Schering Corp.) and the Dutch menformon are essentially the same. The units are interchangeable. The American preparations are available for use as vaginal suppositories as well as hypodermic solution. The progynon is prepared for injection and for oral administration. The use of further standardized materials for oral administration will probably be possible within a few months.

Doses advised have been large. Clinical use has shown that the desirable amounts are from 5 to 20 units daily, for sustaining of the result. By suppository, the dose must be some 3 times as great; orally, some 5 times as great as the hypodermic dose. The various unstandardized materials sometimes help, but are apt to be wasteful. Duration of the treatment can only be determined by trial. There is some suggestion of a shortening of the menopause by relief of the symptoms. This will be established only after many cases have been followed.

Understanding of the activity of folliculin as an endometrial stimulant is important to avoid overdose results, such as menorrhagia, dysmenorrhea, or aphrodisiac symptoms. Folliculin may be expected to cause uterine development in hypo-ovarian cases, but not necessarily to lead to fertility, since this is only one of the necessary factors involved. The follicular hormone exerts no stimulating effect on the ovaries. The stimulation of the uterus to normal menstruation would require also the use of progestin from the *corpus luteum*, not yet on the market. Folliculin is contraindicated in the menopausal menorrhagias and metrorrhagias.

#### SUMMARY

Three types of menopausal disturbances are described, which may be termed simple, pseudothyrotoxic, and involucional varieties. The differ-

entiation of these conditions from thyroid disease and from other mild psychoses is discussed. History and the therapeutic test of follicular hormone preparations and the size of doses depends on whether oral, hypodermic, or vaginal pessary medication is desired.

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## Medical Participation in Tuberculosis Case-Finding

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*Commissioner of Health*

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**D**URING the past several years the Detroit Department of Health, in co-operation with the Wayne County Medical Society, has been engaged in instituting a program of participation by the general medical practitioner in the official public health procedure. The purpose of this program is to secure the sympathetic and whole-hearted support of the medical profession in order that the general practitioner may not only practice curative medicine but also actively assume his part and share the responsibility of the health program. The Health Department feels that the public will benefit if the physician stresses the value of keeping the individual well in contradistinction to serving those who are ill. The medical practice of the future should emphasize prevention. No physician is fulfilling his obligation to the families in his care unless he extends to them all available facilities for disease prevention, such as vaccination against smallpox, immunization against diphtheria, periodic physical examinations, and continued observation for early signs of tuberculosis. To the physician there should be the satisfaction of keeping his patient well; for the individual, the gratification of being spared the financial and economic drain of sickness. The Health Department will obtain its objective of a lower death rate and the extension of the life span.

When this program of medical participation was inaugurated several years ago, it was determined to limit the program first to one phase of the problem. Diphtheria protection was chosen because of the relative ease of application and because of the simplicity of preparing the public to receive the service and the physician to provide it. A summary of the diphtheria protection undertaken has been published elsewhere.<sup>1</sup>

It may be well to repeat certain factors which have contributed to bringing about the accom-

plishments already enumerated. First, it was essential that there should be continuous contact between the Health Department and the Public Health Committee of the Medical Society. There have been weekly meetings. Second, post-graduate medical conferences have been instituted. The first series dealt with the treatment and prevention of communicable diseases. The last series, which extended over a period of three months, was devoted to tuberculosis. The conferences have been held weekly during the winter months with an average attendance of 250 physicians. Third, provision has been made to contact those physicians who do not attend the meetings of the County or District Societies and who have not participated in the post-graduate conferences. Special medical co-ordinators have been employed, who visit such physicians in their own offices. Fourth, a program of popular health instruction has been maintained by the Health Department. Fifth, the Health Department has established a system of home visitation and instruction to parents through the agency of the public health nurse. All of these factors have tended to prepare the public and to serve the physician.

In the Fall of 1931, plans were formulated to extend the program into the tuberculosis field with the view of establishing a large number of co-operating physicians who would participate in the early case-finding program sponsored by the National Tuberculosis Association during the month of April. In formulating the program it was decided that we should follow as nearly as possible the features of the diphtheria protection program which has proven successful during the past two years. To the physicians it has been made clear, as in the case of the diphtheria program, that a distinct contribution is being made by the co-operating physician who, at

a specified hour and day, is performing a service for which he is charging a fee less than the service would ordinarily demand. This contribution is being made for the purpose of stimulating an interest on the part of the public in preventive as well as curative medicine.

The physician, in the form of agreement which he signs, states that on certain days and at certain hours he will examine all school children who come to his office, that he will give a tuberculin test, to be followed by an X-ray examination when such is required. Furthermore, such school children will be examined for \$1.00 if parent can pay; otherwise without charge. The charge for the X-ray examination is to be within the means of the patient but if the latter cannot afford to pay for the X-ray study, the Health Department will make the X-ray examination free of charge and report the findings to the co-operating physician. There is nothing in this plan which contemplates that there should be any reduction in fees charged at any other time than that specified in the agreement. In fact, it is anticipated that for service rendered at other times, the physician shall make his usual charge. There is no desire to in any way interfere with the monetary relationship between physician and patient. The service rendered under the agreement plan is considered primarily of an educational character, a fixed and reduced fee having been determined upon as an inducement to contact the layman with the medical profession.

The first point of departure from the procedure usually followed is that, instead of offering a free tuberculin test in the schools, all of this will be done in the physicians' office. During April a notice will be sent to all parents urging that they send their child to the physician of their choice. In case they do not have in mind any particular physician, they may obtain the name and address of one of the co-operating physicians from the Medical Society, the Health Department, or from the school teacher.

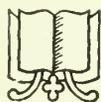
Under the suggested plan the physician will make many new contacts in his office. He will

undoubtedly be visited by patients who have not previously considered him as their physician. This will enable the physician to render an educational service to his new patient and will afford an opportunity of extending his professional services to other members of the household and acquaintances of the new patient. This should result in many new professional contacts.

The Local Tuberculosis and Health Society is sponsoring jointly with the Health Department the educational program through radio, billboard advertising, newspaper articles, and speakers before lay groups. Material for the von Pirquet test is available without charge from the Department of Health. A group of co-operating Roentgenologists has been organized and they have agreed to accept the physician's statement regarding the parents' ability to pay for the X-ray service. The Medical Society has organized a Technical Committee, consisting of tuberculosis experts, and the suggestion has been made to all co-operating physicians that before the official report of a case of tuberculosis is sent to the Local Health Department, the physical examination report, together with the X-ray film, may be referred to this Technical Committee for review. A standard physical examination report blank has been prepared for the convenience of the co-operating physician. He will make a statistical report to the Committee with regard to the number of von Pirquet tests given, the number of physical examinations, and the number of X-ray studies. In this way we hope to form some judgment of the effectiveness of the campaign.

To summarize briefly, a program has been developed, the purpose of which is to find early cases of tuberculosis and secure prompt medical and hospital care. The program anticipates that all of the examinations will be made in the office of the physician which thus serves as a health center and as an adjunct to the official health agency of the community.

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## Proceedings Minnesota Academy of Medicine

Meeting of April 13, 1932

THE regular monthly meeting of the Minnesota Academy of Medicine was held at the Town & Country Club on Wednesday evening, April 13, 1932. Dinner was served at 7 o'clock and the meeting was called to order at 8 o'clock by the President, Dr. J. C. Litzenberg. There were 47 members and 2 visitors present.

Minutes of the March meeting were read and approved.

The President announced that the Executive Committee decided to have the May meeting on the third Wednesday of the month, May 18th, on account of the regular dates conflicting with the A.M.A. meeting in New Orleans.

The scientific program of the evening was as follows:

Dr. John F. Noble (St. Paul) read his Inaugural Thesis entitled "The Relationship of Hepatitis to Cholecystitis."

### DISCUSSION

DR. O. H. WANGENSTEEN (by invitation): I believe clinicians generally will welcome this study of Dr. Noble. It is my impression that it is the best approach to the solution of the problem. Too often the hepatitis has served the surgeon as an explanation for unhappy results following surgery upon the biliary tract. It is rather unusual, and perhaps not without significance, that pathologists, who are undoubtedly quite conversant with most of the pathological disturbances that affect the liver, should have taken no cognizance of the predicated relationship between cholecystitis and hepatitis.

I would infer from Dr. Noble's study that there is an even higher degree of correlation between the age factor and hepatitis than exists between cholecystitis and hepatitis. It is a remarkable fact that these changes in the liver are observed almost entirely on the superior surface, and only very rarely on the interior surface where the liver comes in contact with other viscera. Some six or seven years ago I undertook the study of the alleged relationship between cholecystitis and hepatitis experimentally. It was found that when acute infections were established in the gallbladder of the dog, attendant microscopic findings were almost uniformly found in the liver. The greater number of these animals died, however, of peritonitis and other effects of sepsis. Success was finally achieved in establishing a chronic cholecystitis in the gallbladder of the dog by placing gauze, agar, and attenuated culture of streptococcus in the gallbladder. In no instance, in 18 animals in which chronic cholecystitis was established in the gallbladder, did an interstitial hepatitis develop. Incidentally, when human gall stones were placed in the

dog's gallbladder, they dissolved rather quickly and no trace of calculi remained. Dr. Ivy has since elaborated some interesting facts from a similar observation made in his laboratory.

Pathologists recognize both parenchymatous and interstitial changes in the liver. These effects in the liver, which surgeons have referred to as hepatitis of gallbladder disease, pathologists would probably describe as not being unusual microscopic findings in the liver. The gross changes that the surgeon sees at operation are undoubtedly only involutinal changes in the capsule—a perihepatitis.

One cannot escape the impression that pathologists are too lenient with surgeons in the diagnosis of cholecystitis upon removed specimens. Even the gallbladders of newborns show pericholecystitis.

It is not an uncommon thing in medicine that our knowledge of therapeutic agents of relief comes before the causes of the disease are ferreted out. To this, gallbladder disease is no exception. The manner in which the gallbladder becomes diseased is still not fully clarified. Naunyn said that all gall stones were the result of infection. Aschoff and Bacmeister later excepted the cholesterol stone. Today we admit that a large number of gall stones are not the result of infection. Stasis in the gallbladder has been blamed as the exciting factor in cholecystitis and cholelithiasis. Still Boyden found that the gallbladders of women (in whom gallbladder disease is two or three times more common than in men) empty more rapidly than the gallbladders of men. Gall stones appear to be as common, statistically, in unmarried as in married women of the same age. Much remains to be found out concerning the genesis of gallbladder disease.

I feel that this study of Dr. Noble is very much worth while and should deal a death blow to the opinion that these scars observed on the liver have any special pathological significance as related to the absence or presence of disease in the gallbladder.

DR. F. R. WRIGHT (Minneapolis): It seems strange to me that a man who has done as much careful study as Dr. Noble has should overlook entirely in his essay the condition of the common duct. It is well known that the best way to cure inflammatory diseases of any organ is to establish drainage. The reason we have infections of the kidney is that proper drainage is interfered with.

In 1913 a man from Boston came out here and startled the medical profession by telling them that the bladder was not as easily infected as had formerly been taught. This is true; and it has been taught at the University of Minnesota for thirty years that the bladder was not easily infected unless drainage was interfered with (circulation interfered with).

I can see no reason why, if we have good drainage

of the gallbladder, the infection should not entirely recover. The gallbladder is a reservoir; bile from the liver comes down and is stored up in it. If there is free drainage into the intestine there should be no long-continued infection.

In this study there is no mention of the common duct apparently. If the common duct is normal, the gallbladder should have perfect drainage and get well.

DR. A. T. MANN (Minneapolis): I can't quite see yet why what we see at operations is not so, i. e., why the changes in the liver which are confined to the areas centering about the chronic gallbladder in such a marked way, are not closely connected with the chronic inflammation in the gallbladder. The marked changes are always in the area centering about the gallbladder. Of course, these changes may occur sometimes in a liver which may show the wide-spread fine markings of a cirrhosis scattered pretty well throughout the whole liver, but I am not talking about that. I am talking about the definite markings located in the area about the gallbladder, those which are of a distinctly higher grade.

At one time I collected some 57 cases, most of which were below 40 years of age, and practically every one of these cases showed markings on the liver in the region of the gallbladder. We graded them in four grades. In the first grade were those in which we could see the yellowish-white spots of connective tissue in the liver, more or less confined to the gallbladder area. They usually radiated from the gallbladder margin of the liver. In the second grade there were real fan-shaped streaks in the liver, more dense near the gallbladder margin, with only little streaks and spots for a few inches; but the gallbladder was fastened more strongly to the liver than normal. In the third grade, this chronic inflammation in the liver had gone on to such a degree that the liver showed small spindles of liver tissue sticking up between these definite scars, fan-shaped again. And in our fourth grade I found two cases in which there was a half-moon of the liver that had apparently all gone and which looked like leather, yellowish-white and wet. These were all cases which had suffered for some time and in which the diagnosis had been studied sometimes by our group, and sometimes by two or three successive groups before they came to our group. They were all very thoroughly studied. They had definite symptoms and definite disability. It seems to me there must be in some of these cases an infection from the gallbladder going toward the liver.

Until it can be shown that there is some definite cause, other than the chronic gallbladder inflammation for the grouping of these markings about the gallbladder area, I feel strongly that it does not answer at all to make any general theoretical statement about changes in the connective tissue of a wide-spread cirrhotic condition in the liver.

I was very much interested in the younger ages in which we found these gallbladders. We had one gallbladder in a patient under 25 years of age. I do not

recall exactly, for these were studied about 10 years ago. We divided them into 5-year periods, between 25 and 30, between 30 and 35, and between 35 and 40; and we had nearly as many between 30 and 35 as we had between 35 and 40. The only way we could figure out the initial cause in the etiology was very indefinite, but we took all the past diseases these patients had had and the nearest conclusions we could arrive at were that the gallbladder disease starts a good many years before we think it does, and it starts long before stones form. The nearest we could get was that the childhood infections of scarlet fever, sore throat, etc., were probable determining factors.

It seems to me there must be a definite group in which there is a definite infection from a chronic cholecystitis to the liver.

DR. J. A. JOHNSON (Minneapolis): I appreciate very much the splendid work and presentation by Dr. Noble. From a clinical standpoint, I have never been able to hold gallbladder lesions responsible for much permanent liver damage. When one stops to consider all the toxins that are taken into the intestinal tract and pass through the portal circulation into the liver, it is not surprising that many changes take place in that organ. It is, undoubtedly, through this source that major damages occur. It is very common to find a normal gallbladder with extensive liver changes. I feel, therefore, that we should be very careful about blaming the gallbladder too much for what happens to the liver.

DR. NOBLE (in closing): I want to thank Dr. Wangensteen for his discussion. It was largely because of his stimulus and suggestions that this work was started. He was interested to know whether or not the hepatitis described by Graham was significant. I consented in 1926 to attempt this study. The material was collected from the autopsy service at the Ancker Hospital in 1928 and 1929 but was not worked up until 1931.

I want to make myself clear with reference to the findings in the gallbladders of the newborn. The leucocytes found here must be considered normal. They are not the result of inflammatory stimulus but must be interpreted simply as wandering cells lodged in the tissue spaces.

With reference to Dr. Wright's criticism, I want to say that, although the fact was not mentioned, the common and cystic bile ducts in all of the cases described were studied grossly and all were found to be patent. In none of the cases was there any anatomic obstruction of these passages. In spite of the absence of an obstructive element, the livers in these cases, as you saw, showed an inflammatory infiltration of the portal spaces.

In answer to Dr. Mann's remarks with reference to scarring of the liver capsule, I want to point out the fact that these scars appeared as frequently on livers in the region of normal gallbladders as in those showing cholecystitis. All clinical authorities are in agreement with Dr. Mann's statement that cholecystitis in younger individuals frequently follows such infectious

diseases as scarlet fever, rheumatic fever, streptococcal sore throat, and middle ear disease.

I agree with Dr. Johnson that in all probability absorption of bacteria and toxins through the portal blood stream is responsible for the constant finding of inflammatory cells in the liver. As Dr. Johnson intimated, cholecystitis is seen in a high percentage of cases of cirrhosis of the liver.

Dr. E. M. Hammes (St. Paul) reported a case of cavernous hemangioma of the sixth and seventh dorsal vertebrae with compression syndrome of the spinal cord, and marked spastic paralysis of eight months' duration, with two laminectomies at six-month intervals, and with complete recovery except for a positive Babinski. An article on Cavernous Hemangioma with complete case report will be published later.

Dr. A. A. Zierold (Minneapolis) reported a case of "Cyst Within the Common Duct."

#### DISCUSSION

Dr. R. E. SCAMMON (Minneapolis): There have been occasional reports or descriptions of small diverticula of the common bile duct. That is quite common in the lower animals. However, as I understand it, this cyst lay within the lumen itself, and that seems to me very peculiar. It does not seem very likely that it is embryologic in its etiology. Certainly these cysts are quite unusual in the human embryo. Occasionally we see little outgrowths, but even these are very unusual.

The meeting adjourned.

R. T. LAVAQUE, M.D.,  
Secretary.

## Proceedings Minneapolis Clinical Club

Meeting of April 14, 1932

THE regular monthly meeting of the Minneapolis Clinical Club was held in the Lounge of the Medical Arts Building on Thursday evening, April 14, 1932. After dinner, the meeting was called to order at 7 o'clock by the President, Dr. F. H. K. Schaaf.

Following a brief business meeting, the following scientific program was given:

Dr. M. H. Nathanson presented his Inaugural Dissertation entitled "Reflex Regulation of the Circulatory System and Its Clinical Application," with numerous lantern slides. (This paper is to be published.)

#### ABSTRACT

The mechanism which we are about to discuss is one of the best illustrations of a fundamental biological law. This is the law of maintenance of constant conditions, whereby a small change of conditions gives rise to reactions which oppose further change. In this respect the mechanism bears some resemblance to the temperature regulating mechanism and the mechanisms which maintain the blood volume and the acid base relationship of the tissue content. The blood pressure and heart rate show only a relative stability but there is a distinct tendency for the return to a fixed level when they are disturbed. Following are examples: If the blood pressure and pulse of a resting animal are recorded, a uniform curve is obtained. If the animal is disturbed in any way or if fluid is injected in the vein, the blood pres-

sure and pulse rate depart from the resting level but soon return to a level, not above, not below, but exactly the same as the former level. There are many illustrations in the human where such factors as exercise and emotion result in alterations of pulse and blood pressure but always with a return to approximately the resting level. Another indication of the constancy of the circulation is the remarkable tendency of the blood distribution to remain unchanged under the influence of change of posture. It is also possible for large vascular fields to undergo vasodilatation without affecting the general blood pressure. This indicates that there are regulatory mechanisms which produce a compensatory vasoconstriction in other vascular fields.

The first important contribution in the mechanism regulating blood pressure, pulse rate, and blood distribution was made in 1866 by Cyon and Ludwig. They discovered two afferent nerves arising in the root of the aorta with nerve endings in the adventitia. These have been named the aortic depressor nerves. Slide 1 is a diagrammatic representation of these nerves and the pathway to the central nervous system. The anatomy of these nerves has been well worked out in various animal species and has considerable anatomic variation in different animals. Of the greatest importance are the physiological studies of these nerves. Stimulation of the central end of the aortic depressor nerve either mechanically or electrically produces at once a sharp drop in blood

pressure as much as 60% of the original level as illustrated in Slide 2. Stimulation of this nerve also results in a marked slowing of the heart rate. There are, then, two important reflexes produced by stimulation of these nerve endings: (1) through the vagus center with cardiac inhibition, (2) through the vasomotor center with vasodilatation and drop in blood pressure. These two reflexes are entirely independent, as the drop in blood pressure is obtained even after both vagi are cut, although there is a greater drop in blood pressure with the vagi tract, due to the marked slowing of the heart. The marked drop in blood pressure as a result of stimulation of the central end of the depressor nerve is due to a vasodilatation of all of the arteries in the body supplied with vasomotor nerves. The chief vascular dilatation, however, occurs in the splanchnic area.

In 1927, H. E. Hering published the results of his brilliant researches demonstrating conclusively that a similar set of nerves originate from the internal carotid artery just above the bifurcation of the common carotid. The nerve endings were limited to a mild dilatation of the internal carotid artery, which he named the sinus caroticus. Slide 3 shows one of these afferent receptor endings in the sinus caroticus. A nerve, which has been named the sinus nerve and is a branch of the glossopharyngeal, carries the impulse to the medullary centers. Stimulation of the sinus caroticus electrically or mechanically, by pressure from within or from without, produces the same slowing of the heart and drop of blood pressure which results from stimulation of the aortic depressor nerves. In the body it is obvious that this system operates in the following manner: a rise of pressure in the aorta and in the carotid artery such as occurs with exertion, excitement, change of posture, immediately stimulates the nerve endings of this regulating system. At once there is a compensatory vasodilatation and slowing of the heart, which tends to return the blood pressure to the normal level. Slide 5 is a schematic drawing showing the sensitive zones in the aorta with the afferent aortic nerves; the sensitive zones in the carotid arteries with the afferent nerves; the vagus and vasomotor centres in the medulla and the afferent routes from the vasomotor center to the blood vessels and from the vagus center to the heart.

To the clinician it is of importance that the sensitive zones in the sinus caroticus can be stimulated by pressure over the carotid artery in the neck. There have been many observations in

humans demonstrating clearly that a distinct drop in blood pressure and slowing of the heart follows pressure in the neck over the region of the sinus caroticus. Slide 6 is a dissection showing the anatomy of the sinus caroticus in a human. Slide 7 shows the site of the pressure for eliciting the reactions, which corresponds usually to the intersection of a line drawn from the upper border of the thyroid cartilage and the anterior border of the sternomastoid muscle.

I have studied the cardioinhibitory effect of sinus caroticus pressure, using the electrocardiograph. Slide 8 shows the average normal response. The electrocardiogram shows a heart rate of 80, which drops to 56 after pressing the sinus caroticus. There are some subjects, however, who have a prolonged cardiac standstill varying from 6 to 12 seconds. This is the case usually in elderly individuals. Slide 9 shows a cardiac arrest of 11.6 seconds. Slides 10 and 11 show the effects of right and left sinus caroticus pressure. The left may act exactly the same as the right, only in lesser degree; or the left sinus caroticus pressure may produce degrees of heart block instead of arrest of the entire heart. Slide 12 shows the production of complete heart block by pressure on the sinus caroticus on either side.

I am not ready to conclude finally the significance of these exaggerated reflexes. It can only be stated at the present time that coronary disease was present in most subjects with this type of reaction. It might be a sign of some diagnostic value.

Slide 15 shows a patient with typical attacks of angina pectoris with negative physical findings and normal electrocardiogram. Pressure on the sinus caroticus was followed by a cardiac standstill of 7 seconds.

I have carried out a series of studies on the effect of drugs on the prolonged cardiac standstill. I will go over these briefly, as they are being published in more detail. Atropine in doses of 1/30 grain eliminated the prolonged pause by abolishing the reflex in several cases. Adrenalin also eliminated the pause. The mechanism was entirely different, however. The reflex depression of the sinus node was not abolished but the adrenalin caused a new focus of excitation in the ventricle. Slide 16 shows this effect. Adrenalin has been tried on four other subjects with the same effect. This forms a very convincing clinical experiment and indicates that when the heart is deprived of its normal pacemaker, adrenalin has a powerful effect in producing new centers

of excitation. That is the reason, of course, why adrenalin is so effective in complete heart block.

Slide 17 shows that ephedrin has no effect comparable to that of adrenalin under these circumstances. Slide 18 shows the effect of barium chloride. Pressure on the sinus caroticus after the administration of barium chloride results in the origin of a new auricular pacemaker. Slide 19 shows the effect of the administration of barium chloride in another subject. Before the barium chloride, a pause of more than ten seconds was obtained. After the use of barium chloride, pressure on the sinus caroticus brought about not a long pause, but a series of ventricular extrasystoles. This indicates that barium chloride increases the excitability of the ventricles so that they immediately take up the cardiac rhythm when the heart is deprived of the normal pacemaker. This effect would be extremely desirable under any circumstances where the heart is liable to come to a standstill, as, for example, in heart block.

Slide 20 shows another adrenalin experiment. Slide 21 shows that 10 grains of caffein sodium benzoate injected intravenously had absolutely no effect in abolishing the pause. This indicates that caffein is of no value therapeutically for the purpose of increasing the excitability of the heart. Slide 22 shows the effect of digitalis. It was very apparent that digitalis instead of acting in the direction of shortening the pause, had a direct tendency to prolong the period of cardiac standstill. While the usual pause in the control record was never more than nine seconds, a cardiac arrest of 16 seconds could be induced after partial digitalization. There was no evidence that digitalis in moderate doses increased the excitability of the heart in this subject.

The results of these pharmacological studies will need further confirmation by additional studies. It is apparent, however, that this forms an ideal method for the study of the effect of certain drugs on the heart muscle.

#### DISCUSSION

DR. F. H. K. SCHAAP: I am sure that we ought to have some discussion on this excellent paper. I am very sorry that we haven't here tonight for demonstration one patient who has died in the meantime from whom, I am sure, Dr. Nathanson has learned a great deal about the carotid sinus. He was an old Scotchman at the General Hospital, who was quite an interesting character; and through his many visits to the hospitals had gained a great deal of information. He had a severe coronary sclerosis and took great pride in demonstrating to the students how he could slow down

his heart and stop its beat for a considerable length of time by pressure over the carotid.

I was particularly glad to get some more information on the effects of digitalis, because there has been so much discussion about its *modus operandi*. I think we should get some really valuable information in the future out of this work.

I should like to ask Dr. Nathanson if I understood correctly that barium chloride had a beneficial effect? In practice I have tried it in a good many cases of heart block with apparently no worthwhile results.

DR. NATHANSON: I note that there have been reports in the literature indicating disappointing results with barium chloride in heart block. However, it certainly was definitely evident in one subject that the barium chloride induced a ventricular rhythm in the heart which had been deprived of its pacemaker. This effect, of course, would be beneficial in heart block. Even in this small series it is apparent that the effects of barium chloride are variable; since in the first subject no ventricular rhythm was obtained, and in an individual showing this type of reaction the drug would be of no value in case of heart block.

DR. ARCHIE BEARD: If the right carotid sinus seems to be of greater value in pressure, does that mean that if a man is left handed, the left carotid sinus takes over the greater predominance?

DR. NATHANSON: As to the explanation of the difference in right and left pressure, the right sinus caroticus stimulates chiefly the right vagus and the left stimulates chiefly the left vagus. This, however, is only quantitative and one will affect the other. Since the right vagus supplies chiefly the sinus node and the left goes to the junctional tissues, the right sinus caroticus pressure will affect principally a slowing of the heart while pressure on the left carotid is more apt to show the conduction defect.

DR. A. A. ZIEROLD: I am not entirely clear as to whether Dr. Nathanson stated that stimulus on one side is sufficient to produce this phenomenon.

The subject is interesting in view of the surgery in those cases of glossopharyngeal neuralgia in which Adson has avulsed the glossopharyngeal by direct exposure and in those operations devised by Dandy of section by cerebellar approach. Certainly if section disturbs the function of this nerve in any way similar to the pressure effects or if the effect or reverse of that is to be true, we might reasonably expect marked change in the pressure and marked changes in the pulse rate. This, although it may have been observed, I do not recall having seen reported. Any discussion of the vegetative nervous system not only explains many things, but makes many others even more obscure. This subject is particularly of interest to the surgeon. I believe, in that it offers a more logical physiologic basis for the so-called Cushing phenomena observed following sudden rise of intracranial pressure.

DR. NATHANSON: The cardiac effects are those obtained by a pressure on only one side. Regarding the experiments in producing experimental hypertension,

(Continued on Page 418)

THE  
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North Dakota State Medical Association	The Minnesota Academy of Medicine
South Dakota State Medical Association	The Soo Railway Surgical Association
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MINNEAPOLIS, MINN., JULY 1, 1932

### THE SOUTH DAKOTA MEETING

The Fifty-first Annual Session of the South Dakota Medical Association, held in Watertown on June 20, 21, and 22, afforded an enjoyable and profitable experience for all who attended it. The dry clinics and papers by such men as Duke, of Kansas City, Richter, of Chicago, our own Leo Rigler and Kenneth Phelps and others were attended with deep interest and the discussion of basic science legislation and collateral matters by Dr. W. C. Woodward, Director of the Bureau of Legal Medicine of the American Medical Association was most informative.

The principal speaker at the banquet was Dr. Herman J. James, President of the University of South Dakota, who spoke of the present status of democracy throughout the world and stressed the great influence which the medical profession could exert in overcoming socialistic trends and other influences which might tend to undermine governmental stability of this country. Dr. A. G. Pohlman, the new Dean and Head of the Department of Anatomy in the Medical School of the University of South Dakota was introduced and made a most happy impression by his manifest desire to co-operate with the profession of the State.

The writer was given the privilege of attending the meetings of the House of Delegates and the council. After brief discussion in the Council, all of a favorable trend, a motion prevailed unanimously continuing the JOURNAL-LANCET for two years as the official organ of the society.

G. C.

### HOSPITALIZATION OF VETERANS

There is continual clamor for increased hospital facilities for war veterans.

When Mars went on a rampage, we were "not prepared for war." When peace came, it would appear that we were not prepared for peace.

In the old manual on physical examinations for the army, one sentence read something like this, "In doubtful cases give Uncle Sam the benefit of the doubt." To the zealously patriotic but oft-times inexperienced members of newly constituted draft boards this meant: "Certify him for service."

Two important facts were overlooked: first, that we were selecting men for an army that had to fight, endure hardships, make forced marches, and be able to "come back" the next day and do it over again without reference to "union hours" or prearranged schedules of work and rest; second, that acceptance into the army constituted a clean bill of health, and that impairments subsequently found, would always be attributable to service.

This, in a large measure, increased the physical disability claims when the war was over. Instead of counting the wounded and crippled alone, it was found necessary to include a multitude of disorders only remotely related to military service.

The question now under discussion is not one of generosity to our veterans nor of penurious evasion of responsibility, but rather *how best to serve them*.

We believe they would be happier and better off if they were not isolated in their afflictions but allowed to select their own family physician and preferred hospitals to care for their infirmities.

A. E. H.

## MEDICAL DUES

Medical dues, like taxes, are usually paid with considerable mental or verbal protest. The inherent protest against taxes has become almost proverbial. The tax may be entirely just and fair. It may even be inadequate to meet the demand for the preservation of the public interest. Yet, because it is levied upon us without us having an opportunity to investigate it in all its phases, we look upon it with suspicion and usually pay it with at least some mental protest.

Medical dues come in the same class. The physician otherwise occupied, unless he is forced by his official position, does not have the opportunity to acquaint himself with all phases of this subject. In this time of depression, no doubt, one feels it necessary to curb expenses. Those giving least visible returns are usually the expenses to cut down first.

Dues, no matter how small, are excessive if not giving adequate returns. To determine whether dues are just or unjust we should know what we are receiving in return for this financial outlay.

Twenty years ago our medical dues in the state of Minnesota were much smaller than today. Our financial outlay for transportation was correspondingly much smaller. Yet would any of us choose to return to the horse-and-buggy age? Not one of us. Neither would we, after serious consideration, want to drop other items of progress this small extra financial outlay has enabled us to procure. It is poor economy to advocate lowering our dues if this small investment is increasing our efficiency.

Dr. Harry M. Hall, former president of the West Virginia medical association, says: "Medical societies, we think, are going through a rapid metamorphosis in the next five years, and, in the end, they will either be one of the strongest aggregations of determined men gathered together in a single human endeavor or they will be nothing but a name."

Dr. A. J. McLaughlin, Medical Director, United States Public Health Service, of Chicago, says: "Proper organization of county medical societies will make state medicine impossible, enable the physician to retain his self respect and preserve that priceless, intimate, confidential relation that should exist between physician and patient."

During this time of depression, ambitious social workers, politicians, and commercial

workers are striving to control the practice of medicine.

The medical profession should and must control the affairs of medicine. Only through an efficient organization can this be done. No organization can accomplish great things without financial backing. It is gratifying to know that few medical men, when they take the time to investigate the situation carefully, advocate the lowering of medical dues at the present time, and it is more gratifying to know that we still have men of great ability who will sacrifice time, skill, and money to keep the control of medicine and health problems in the hands of the medical profession, where it justly belongs.

J. M. H.

## NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

A new hospital is to be opened at Alcester, S. D., with Dr. G. E. Johnson in charge.

Dr. Chas. T. Granger, Rochester, Minn., has been appointed County Physician of Olmsted County.

Dr. I. R. Salladay, White River, S. D., has moved to Pierre and is now associated with the Pierre Clinic.

Dr. R. A. Scott, who has been in practice at Detroit Lakes, Minn., has moved to Los Angeles, Calif.

Dr. A. A. McLaurin has retired from the Pierre Clinic, and opened offices for general practice in that city.

Dr. Horace G. Scott, Minneapolis, was married last month to Miss Grace Melges of Redwood Falls, Minn.

Dr. F. E. Siedenburgh, Portsmouth, Ohio, has returned to Sioux Falls, and is again associated with the Moe Hospital.

Dr. Henry S. Plummer, Rochester, Minn., has been elected president of the American Society for the Prevention of Goiter.

Dr. I. M. Freese, a well known railway surgeon of Jamestown, N. D., was accidentally killed by the discharge of a rifle while on a recent hunting trip.

Drs. A. C. Dean and J. S. Rogers, Hot Springs, S. D., were both on the program as speakers at the late meeting of the Nebraska State Medical Society.

Dr. H. J. Bartron, Watertown, S. D., was elected president of the South Dakota State Hospital Association at the annual meeting recently held at Mitchell.

Dr. W. J. Lund, one of the surgeons of the Northern Pacific railway hospitals at St. Paul, is now located at Staples, Minn., succeeding the late Dr. Frank Allen.

Dr. C. B. Bomberger, Mapleton, Minn., died in Colorado last month after a long illness of tuberculosis. Dr. Bomberger was a graduate of the University of Minnesota.

Dr. Ray B. Farnsworth, son of Dr. C. P. Farnsworth, of Chamberlain, S. D., and a recent graduate of the Medical School at Omaha, has opened office for general practice in Chamberlain.

Over 100 physicians and surgeons of the Great Northern railroad gathered at Duluth last month for their summer convention. Dr. A. N. Collins, Duluth, was in charge of arrangements and program.

Dr. S. A. Slater, Worthington, superintendent of the Southwestern Minnesota sanatorium, has returned from the annual meeting of the national tuberculosis association at Denver, where he was a guest speaker. He was re-elected to the board of directors.

Dr. R. J. Morrisey, Pierre, S. D., died last month from blood poisoning, not deemed serious originally, but which developed rapidly and the best of medical aid failed to check the disease. Dr. Morrisey had been in active practice for over 25 years.

Dr. Helen Hughes Hielscher, Mankato, has been named to the Minnesota State Board of Health and vital statistics. She is the first woman to be appointed to membership on that board. The two others on the board are Dr. Nils G. Mortenson, St. Paul, and Dr. J. A. Thabes, Brainerd.

The last regular meeting of the Sioux Falls District Medical Society was held on June 14th. The guest speaker was Dr. S. Marx White, Professor of Medicine at the University of Minnesota, his subject being "Heart Disease in Pregnancy." The society will not hold any more meetings until September 1st.

Dr. M. S. Henderson, of the Minnesota State

Medical Association, addressed the members of the Southwestern Minnesota Medical Society on "Fractures" at the semi-annual meeting held in Worthington, Minn., on May 3. A film on "Traumatic Surgery of the Extremities" was also a feature of the program.

Dr. A. Stolinsky, who has been practicing medicine at Sheldon, N. D., for the last five years, is leaving for Vienna, Austria, where he will take up post graduate work for 14 months. He will return to Sheldon and resume his regular practice on September 1, 1933. Dr. A. L. Klein, of Crystal, N. D., will take over Dr. Stolinsky's practice as a locum tenens until the latter's return. Mrs. A. Stolinsky will accompany her husband and will attend the graduate department of the University of Vienna.

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters). Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month of July will be as follows: July 6th, "Management of Heart Disease"; July 13th, "Vitamin A"; July 20th, "Purpose of Vacations"; July 27th, "Cancer of the Mouth."

The annual meeting of the Minnesota Radiological Society was held in St. Paul with officers for the coming year being elected as follows: President: Dr. Gage Clement, Duluth; Vice President: Dr. Edward Schons, St. Paul; Sec-Treas: Dr. Leo G. Rigler, Minneapolis. The following scientific program was presented: 1. Intravenous Urography as an Aid in Diagnosis, Dr. G. T. Nordin, Minneapolis. 2. X-ray Treatment of Inoperable Carcinoma of the Breast, by Dr. Eugene T. Leddy, Rochester, Minn. 3. Round Table Discussion of Cases for Diagnosis, conducted by Dr. J. R. Aurelius, St. Paul. 4. Clinical-Radiological Conference—Diseases of the Chest, by Dr. B. R. Kirklín, Rochester. 5. Clinical-Radiological Conference, Diseases of the Stomach, by Dr. Leo G. Rigler, Minneapolis.

Judge McNally of the District Court of Ramsey County, sentenced Herman C. Frerichs, 52 years of age, who claimed to be a naturopathic physician, to pay a fine of \$100 or serve 30 days in the workhouse for practicing healing without a Basic Science Certifi-

cate. Frerichs paid the fine. Frerichs maintained an office in St. Paul for the purpose of practicing naturopathy. He had considerable equipment for the giving of light ray and diathermy treatments. Frerichs claims to be a graduate of Heidelberg, but apparently is unable to produce his diploma or other credentials. In 1927 he obtained a massage license from the old Massage Board but voluntarily surrendered it in 1929 when the masseurs were placed under the regulations of the State Board of Medical Examiners. Following his arrest in April, 1932, he removed the signs from the front of his home and was instructed to remove his listings from the telephone directory and the city directory. He was also warned by the court against attempting to practice healing in the future until he was properly licensed. Frerichs claims to have been engaged in the healing art for the past 21 years. His activities were first called to the attention of the Medical Board early in 1930, and, following an investigation, agreed in writing to refrain from practicing healing in the future. His failure to comply with this agreement resulted in his arrest.

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##### LOCUM TENENS POSITION WANTED

Experienced, well qualified physician available any time from July 20th to September 25th. Can furnish car, can speak German. Licensed in Minnesota, Iowa and North Dakota. References. Address Box 917, care of this office.

#### PROCEEDINGS OF MINNEAPOLIS CLINICAL CLUB

(Continued from Page 114)

it is apparently necessary to cut all four nerves. There is a possibility that certain of the collapses associated with surgery in this region may be explained on the basis of the sinus caroticus reflex. Pulling on the carotid artery may result in drop in blood pressure of 60 to 70 mm. This effect is exaggerated by general anesthesia. It has been recommended by a German surgeon that where there is any necessity for downward pulling of the common carotid artery, the carotid sinus first be cocainized. He finds that then there is no drop in blood pressure on pulling this artery. As regards the possibility of danger in utilizing the sinus caroticus test, this has been carried out for a number of years without any serious effects. Wenckebach studied the effect of pressure on the neck on heart rhythm for years and stated that while slight convulsions and syncope may occur, there have been no more serious results. It has been found in experimental work that if the vagus is stimulated, the heart can be stopped but you can never stop it long enough to kill the animal. Eventually the heart will break through the vagal inhibition.

The meeting adjourned.

H. BRIGHT DORNBLASER, M. D.,  
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PROCEEDINGS OF THE HOUSE OF  
 DELEGATES OF THE  
 FORTY-FIFTH ANNUAL SESSION OF  
 THE NORTH DAKOTA STATE  
 MEDICAL ASSOCIATION

TUESDAY, MAY 31, 1932

The first meeting of the House of Delegates was held at the Dakotah Hotel, Grand Forks, North Dakota, and was called to order at 8:15 p. m. by the President, Dr. Henry M. Waldren, Sr., Drayton.

APPOINTMENT COMMITTEE ON  
 CREDENTIALS

The President appointed Dr. J. M. Moore, Grand Forks; Dr. Paul H. Burton, Fargo; and Dr. J. W. Bowen, Dickinson, to serve as a Committee on Credentials.

**ROLL CALL**

Secretary Skelsey called the roll and the following Delegates, Councilors and Officers responded:

Drs. H. F. Emert, Sarles; W. F. Sihler, Devils Lake; H. B. Huntley, Leonard; A. P. Nachtwey, Dickinson; H. A. Brandes, Bismarck; C. J. Meredith, Valley City; L. W. Larson, Bismarck; Joseph Sorkness, Jamestown; W. H. Cuthbert, Hillsboro; C. R. Tompkins, Grafton; John H. Moore, Grand Forks; Paul H. Burton, Fargo; J. L. Devine, Minot; N. O. Ramstad, Bismarck; G. F. Drew, Devils Lake; F. L. Wicks, Valley City; J. W. Bowen, Dickinson; A. E. Spear, Dickinson; E. A. Pray, Valley City; James Grassick, Grand Forks; G. M. Williamson, Grand Forks; Murdock MacGregor, Fargo; Frank I. Darrow, Fargo; T. H. Lewis, Fargo; R. D. Campbell, Grand Forks; L. B. Greene, Edgeley; W. W. Wood, Jamestown; A. D. McCannel, Minot; A. L. Cameron, Minot; R. H. Breslin, Williston; President Waldren and Secretary Skelsey.

The President declared a quorum present and the House duly constituted for the transaction of business.

**MINUTES**

Secretary Skelsey moved that the minutes of the Forty-Fourth Annual Session as published in the Journal-Lancet, July 15, 1931, be adopted, and that the reading of minutes be omitted.

The motion was seconded and unanimously carried.

**REPORT OF THE SECRETARY**

The Secretary, Dr. A. W. Skelsey, presented the following report:

## SECRETARY'S REPORT

On May 28th, 1932, the paid-up membership was 366. During the past year we had a total of 396. The county and district secretaries sent in their reports and remittances in good time and form.

Dr. H. J. Rowe, of Minneapolis, who had been our state secretary for a number of years, died in November, 1931. An appreciation of his work will be given in the report of the Necrologist.

This year I did not attend the Northwest Regional Conference held in St. Paul, nor the meeting of the National Secretaries in Chicago. However, I went as delegate to the American Medical Association national meeting in New Orleans, and have made a separate report of same. Because New Orleans was quite far distant, and probably also because of the financial depression, there was not a very large attendance. Two thousand seven hundred and seventy-eight were present.

At Aberdeen, S. D., last June, where we met with the South Dakota association to celebrate our Fiftieth Anniversary, the representative of the Woman's Auxiliary, A.M.A., effected an organization in North Dakota through the election of a president and secretary. I do not know definitely to what extent this newly created organization has functioned as yet.

Beginning with August, 1931, our new State Medical Registration Law went into effect.

The *Journal-Lancet* has published a series of special numbers during the past year, some of which compare very favorably with medical journals having a much larger circulation. Last January, upon invitation of our Cass County Medical Society, some of the editorial staff came to Fargo and furnished several excellent papers. At the evening dinner Dr. J. A. Myers, of Minneapolis, described the plans of the magazine and also discussed advertisements.

A few states have sent us resolutions transmitted by them to Congress, urging some modification of the Medical Reserve Officers' physical training. If you are interested in following up this subject, I have with me a copy of such resolutions.

This year also brought up the usual efforts to obtain federal aid for maternal and child welfare activities and thus perpetuate the Sheppard-Towner plan. The new bills were sponsored by Messrs. Jones and Bankhead. As you have been previously advised, the American Medical Association and other organizations are decidedly opposed to such legislation; while on the other hand

certain groups are insistent about extracting money from our national treasury.

I presume many of you have been liberally circularized in regard to the proposed legislation concerning birth control. Bills have been introduced into the National Congress by Dr. H. D. Hatfield, of West Virginia. The laity and some of the militant religious denominations are having quite a conflict. The proponents apparently believe that if the so-called Federal restrictions are removed, a hundred per cent successful prevention system can be evolved. Which is some wager. At its recent meeting in New Orleans the A.M.A. tabled a motion to appoint a committee to study this problem. A few days ago the House in Washington, D. C., voted down the House Bill. Since this subject has become the topic of Ladies' Aid Societies and social gatherings, it seems to me that some of the medical journals, the public newspapers, and some proprietary firms are carrying advertisements which are entirely too brash, even though they craftily designate their wares, suppositories, etc., as merely an aid to prevent *infection*.

Indiana, at its annual meeting this year, devoted a half day to medical economics. As their society has a three days' session, they can well give time to this subject.

Various national committees, endowed organizations, etc., keep plugging away on the topics of physicians and hospitals and the so-called economics connected therewith. Newspapers and magazines continue to pour forth hectic articles about the alleged excessive cost of medical care and of hospitalization. The newly-created Bureau of Medical Economics sponsored by the A.M.A. has covered much ground during the past year. You are urged to read those portions of the *Journal A.M.A.* and of the *Bulletin A.M.A.* which give valuable data. Other subsidized organizations, one of which is based on a proposed five-year survey, intimate that they must have yet more time in which to survey and print results. It would seem as though a really efficient and sufficient report could earlier be obtained, by taking certain cross sections of the country, including therein several cities.

Closely related to this is the subject of lay, corporation, and semi-medical intrusion into the medical field. One recent and typical example was that of Montgomery, Ward & Co., one of the largest mail order houses in the United States, offering and giving to the public at large a urine examining service. The *Journal A.M.A.* of May 21st, editorially advises us that Montgomery,

Ward & Co., taking note of the medical men's protest, will withdraw this laboratory service.

There are three or four bills in Congress seeking to remove or modify restrictions imposed upon physicians as to the quantity of liquor that can be prescribed or dispensed. We, in this supposedly dry Sahara of North Dakota, may fail to appreciate these efforts.

Probably one of the most serious inroads affecting our medical profession has been the United States Veterans' Legislation, which proposes extensive plans for the building of many new hospitals, and proposes authorizing free medical and surgical services to all so-called Veterans, even to those who never had any former service disability. The Shoulder plan and the Minnesota plan have been brought forward by the medical profession as a tentative substitute for this legislation. However, and finally, the people of these United States are becoming tax-conscious and are now earnestly trying to reduce the enormous financial burdens. From the public, rather than from the medical profession, must come the demand to Congress to halt the enormous raids upon the national treasury.

#### A PATRIOTIC PETITION

This is the heading of an editorial appearing May 21, 1932, in *The Churchman*, the leading weekly publication of the Episcopal Church. It decidedly endorses the petition of The National Economy Committee, of which Archibald B. Roosevelt is secretary, to the President and Congress. I quote some extracts from the document:

"We petition for the elimination of all expenditures for Veterans of the World War who did not in fact suffer disability in war service. We petition for a return to the sound policy in which the World War Veterans' Legislation was first conceived . . . just and liberal compensation to the dependents of those who lost their lives in war service, and to the veterans who in fact suffered some disability in the war. We petition for the repeal of the later statutes which permit payments for Veterans of the World War who, *without suffering any physical detriment to themselves, did no more than perform their duty as citizens.* We petition for the repeal of the provisions of the Spanish-American pension statutes which permit payments to veterans for disabilities not connected with service in that war. We petition . . . for a drastic reduction of the growing annual expenditures in the Federal Budget for Veterans of the World War and the Spanish-American War. . . . Thus there has insidiously grown up by legislative enactment . . . so grad-

ually as not to be realized by the people at large . . . a system of war benefits for men who suffered no physical injury in war service already running into the hundreds of millions of dollars . . . a burden which will rapidly increase from year to year unless the present laws are repealed. . . .

"The above recitals comprise a few . . . but a few only . . . of the facts demonstrating that an immense and growing legalized abuse has been fastened upon the people, which has reached a point which is beyond toleration, and demands immediate abatement. . . . Let no one assert that these petitioners desire to deprive any man who has served his country in military service of his just due. We advocate not merely just but liberal treatment of the dependents of all who lost their lives in war service and for all who suffered disability in war service. What we oppose is the payment of the great sums which are being disbursed to or for those who suffered no physical detriment in the war. . . . A system which saps the resources of the people and creates a specially favored class receiving a great subsidy from the people at large."

The editorial states that this petition was originated chiefly by men who were active in war service; that it, *The Churchman*, agrees with one who already has spoken of the reckless expenditure with which the petition deals as a "vast, legalized racket," that it is high time for Americans to remember their rights as citizens, and that the first amendment to our Constitution guarantees to the people the right "peaceably to assemble and to petition the government for a redress of grievances" a right which has been too often forgotten. The editorial claims that genuine Americanism, in place of the super-patriotic vaporizings and genuflections, of which we have had an over-abundance from soft-headed politicians and societies, will do something toward restoring our backbones and our liberties.

Copies of the petition for signatures may be secured from The National Economy Committee, 19 West 44th Street, New York City.

You will be interested to know that in a table published by the A.M.A. showing the percentage of state physicians receiving *Journal A.M.A.*, compared with the number of physicians in each state, North Dakota ranks second with 67 per cent, and New Jersey ranks first with 72 per cent. Of the total population of North Dakota illiteracy percentage is only 1.5 per cent. I mention this here because in looking over the September, 1931, copy of Mencken's *Mercury*, I

noticed he attempted to support his editorial about education and inferior colleges by stating that "they (the colleges) are even spattered over such barbaric states as Mississippi and *North Dakota*, where it would be dangerous to be educated in any real sense." This sarcastic thrust may have been due to a very small purchase in North Dakota of the *Mercury*.

Dr. J. E. Engstad sends me a copy of our First Constitution and By-Laws, and also a copy of the program of our Third Annual Meeting held in Larimore in the year 1889.

I call your attention to Dr. Grassick's book entitled "North Dakota Medicine." Copies may be secured at the registration desk. Price \$3.50.

A. W. SKELSEY,  
Secretary.

Dr. W. F. Sihler moved that this report be referred for consideration to a special committee to be appointed by the President, to report back at the next meeting of the House of Delegates.

The motion was seconded and unanimously carried.

The President appointed the following to serve as a reference committee: Drs. C. R. Tompkins, Grafton; G. F. Drew, Devils Lake; L. W. Larson, Bismarck.

REPORT OF TREASURER

Dr. William W. Wood presented the following report, which was automatically referred to the Council:

June 1931 to May 31, 1932, Inclusive

Balance May 30, 1931, Savings Account.....	\$2,343.38
Checking Account.....	1,593.38
Total Balance, May 30, 1931.....	\$3,936.76

Receipts during the year

Dues .....	\$1,885.00
Grassick Bank Fund.....	20.17
Div. from Carrington closed Bank .....	1.60
Interest Liberty Bonds.....	42.50
Total receipts.....	\$1,949.27

Disbursements

Checks #240 to 254 (15) as per vouchers .....	\$3,157.29
Exchange on checks.....	4.35
Total Disbursements.....	\$3,161.64
Total receipts.....	1,949.27
Net Disbursements over receipts..	\$1,212.37
Total assets, May 31, 1932.....	\$2,724.39

Distribution funds at present

Savings account incl. \$1,000.00 bond .....	\$1,042.50
Check account.....	1,697.64
Total assets.....	\$2,740.14
Less one check #254 uncashed....	15.75
Total assets.....	\$2,724.39

Disbursements in detail for year were as follows:

Dr. Waldren, Expense, Public Relations Committee .....	\$1,533.62
Dr. A. W. Skelsey, Services as Secretary....	400.00
Master Report Co., Reporting meeting....	25.25
Hannaber Anderson, Stationery Printing Co..	25.25
Stutsman Co., Record receipt book.....	3.75
Journal Lancet, July 31 to January 32.....	385.00
Fargo Floral Co., Flowers Dr. Rowe.....	10.50
Shotwell Co., Flowers Dr. Rowe.....	15.00
Wm. W. Wood, Postage, supplies for three years .....	6.50
Dr. J. F. D. Cook, Half joint meeting with S. Dakota .....	479.35
A. W. Skelsey, Expense of Secretaryship....	28.98
Mrs. James Blake, Expense of organizing Woman's Auxiliary.....	26.44
Dr. V. J. LaRose, Teleg. of Legislative Comm	5.28
Dr. A. W. Skelsey, Expense as delegate to New Orleans.....	186.00
Dr. H. M. Waldren, Telephone and Telegraph expense .....	15.75
July 1, 1931 to April 7, 1932	
	\$3,157.29

Respectfully submitted,

(Signed) WILLIAM W. WOOD, M.D., Treasurer

REPORTS OF COUNCILORS

FIRST DISTRICT

We have had seven meetings during the year, with an average attendance of 31. The January meeting was an afternoon and evening affair, the program being presented by members of the Board of the Journal-Lancet.

Twelve resident members have appeared on our programs.

Our paid up membership May 1, 1932 was 59.

Respectfully,

MURDOCK MACGREGOR, M.D., Councilor.

SECOND DISTRICT

The Devils Lake District Medical Society has had a very agreeable and profitable year. Our membership has increased by one. We received two new members and voted in three, one not qualifying financially. Also tried to admit one man who is in the Indian service but who was not registered in the State. This did not seem agreeable to the American Medical Association although applicant is registered in Georgia.

We had three good programs; well attended, no friction or dissension and we think we are doing fine.  
Respectfully submitted,

(Signed) G. F. DREW, M.D., Councilor.

#### THIRD DISTRICT

The problem confronting the officers of the Grand Forks District Medical Society is to get all fellows practicing in the district to become active members of the Society.

There are seventy-four physicians in active practice in this District. Sixty-two were members in 1931 and but fifty-four have paid dues thus far this year. Of the number who are eligible, some five or six hold membership in an adjoining Society, which is more conveniently located. Two deaths occurred during the year, both faithful members all their lives, Drs. J. C. Smith, Thompson, and C. E. Bennett, Aneta.

The officers of the Society are active; good programs have been furnished. It seems strange how indifferent and uninterested some men are to the profession which cost them so much. I have noticed that these are the men who complain most about irregularities and midwives, yet do nothing to help the profession.

As a member for many years of the Examining Board for admission to license, I can pass along this information, that when an application for license to practice medicine in this state is presented one of the points that is most actively scrutinized is that of his membership in his local and state society. There is one of two things wrong with a fellow who does not belong to his local society:

First, he may be unethical and his practice of such a character that he is not permitted to join.

Second, he is so indifferent to the general welfare of his profession that he pays no attention to what is being done. This type of applicant usually fails to satisfy the Examiners.

An effort was made to organize a Woman's Auxiliary in this District but there seemed to be little enthusiasm among the wives of the Doctors. The chief argument advanced by the women was that they belonged to many clubs and could find no time to devote to promoting another club locally.

The best of good fellowship prevails in the ranks of the profession.

Respectfully submitted,

(Signed) G. M. WILLIAMSON, M.D., Councilor.

#### FOURTH DISTRICT

We have fifty-seven old members in good standing. Eleven have been suspended for non-payment of dues; five have been reinstated. We have three new members; one member has moved away. There have been no deaths.

Twelve meetings were held, with an average attendance of twenty-five. During the summer three meetings were held at the Country Club. These meetings were entirely social, no scientific program being provided.

During the winter months we had the pleasure of listening to a number of speakers from other states.

We feel that altogether the Northwest District has passed an enjoyable and profitable year.

Respectfully submitted,

(Signed) E. M. RANSOM, M.D., Councilor.

#### FIFTH DISTRICT

The Traill-Steele District Medical Society has a membership of eleven.

Three regular meetings have been held, all in Mayville.

The spring meeting was addressed by Dr. H. Barnes on the subject, "With Byrd in the Antarctic."

The summer meeting was addressed by Drs. French and Haugen of the University; the former speaking on "Food Poisoning with Special Reference to Botulisms;" the latter on "Microscopic Characteristics of Inflamed Tissues and of Fibrous Repair Tissue."

"The Obstetrical Patient" was the subject under discussion for the fall meeting. This being presented by Drs. Hanna and Fortney of Fargo.

Dr. R. C. Little is President; Dr. Syver Vinje is Secretary, Drs. Vinje and Cuthbert are delegates.

The Sheyenne Valley Society has eighteen members. Four meetings have been held.

Our fall meeting was addressed by Drs. Ramstad and Larson of Bismarck, the subject discussed being "Tumors of the Neck."

Subjects of discussion at other meetings were: "Fees in County Medical Work," "The Official Magazine," "Contact of the Medical Profession with the Legion."

Our society would be glad to extend its aid to others in the establishment of stabilized fees in county work. The ladies met with us at our late spring meeting and organized an Auxiliary Society the officers of which are: President, Mrs. Westley, and Secretary, Mrs. Alm-klov, both of Cooperstown.

Our officers are: President, Dr. C. J. Meredith; Secretary-Treasurer, Dr. Will H. Moore, and Delegates, Drs. Meredith and Zimmerman.

Respectfully submitted,

(Signed) F. L. WICKS, M.D., Councilor.

#### SIXTH DISTRICT

During the past year four meetings were held with an average attendance of thirty-three members and six visitors.

There were two speakers from out of the State: Dr. C. A. Stewart, Minneapolis, and Dr. J. A. Evart, Glendive, Montana.

There were two speakers from other societies: Dr. H. M. Waldren, Sr., of Drayton, North Dakota, who spoke to us about "Medical Legislation," and Dr. P. H. Burton, of Fargo, who presented a paper on "Backache."

During the year ten members of the local society appeared on our programs.

There are now fifty-two members in good standing.

Two members have moved away: Dr. Rex Graber who located in Wisconsin, and Dr. J. H. Hoskins who moved to Wahpeton, North Dakota, but has thus far retained his membership here.

As the result of Dr. Waldren's visit, a physician was

appointed in each locality of our district to keep in contact with the American Legion in relation to medical legislation.

There were no deaths among our members during the year.

A committee of the society is now working with the officers of the KFYR Radio Broadcasting Station in an endeavor to present medical information to the public, which will be sponsored by the members of our society.

Respectfully submitted,

(Signed) N. O. RAMSTAD, M.D., Councilor

#### SEVENTH DISTRICT

I herewith present a résumé of the activities as well as a roster of the membership of our local County Society for the past year.

We have had four well attended and instructive meetings usually preceded by a splendid dinner at the Hospital. At our first meeting Dr. C. A. Stewart, of Minneapolis, presented a paper on "Tuberculosis in Children." This was cleverly presented, and gave much food for thought on this important subject.

Dr. Regan of the State Hospital, gave us a talk on "Malaria in Paralytica Dementia," and demonstration of patients. This was quite a remarkable demonstration of the results obtained as a rule.

Dr. Fred Willius of Rochester gave us an illustration talk on "Rheumatic Heart Disease." This paper needs no comment, as all who know Dr. Willius appreciate the clear manner in which he presents his subject.

Our last meeting of the year gave us Dr. H. J. Fortin, of Fargo, who presented a wonderful talk, illustrated with slides, on the very broad and difficult subject "Arthritis."

We boast 100 per cent membership in our county, having a total of twenty-one. We have lost one member, Dr. A. T. Bailey.

The year has passed pleasantly, harmony, good fellowship and active co-operation prevailing, for which we are thankful. Unfortunately, as with the rest of our tribe, we are financially a flop.

Respectfully submitted,

(Signed) P. G. ARZT, M.D., Councilor.

#### EIGHTH DISTRICT

The Southern District Medical Society has not been particularly active during the last few months. During the first of the year we held several fairly well attended meetings, at which some good papers were presented and some excellent surgical films were shown.

Considerable difficulty is still experienced in getting members to join. The large amount of territory included in the district, coupled with the fact that there are no towns in the district that might be considered Medical Centers, always has and always will work against a complete membership.

Respectfully submitted,

(Signed) LEE B. GREENE, M.D., Councilor.

#### NINTH DISTRICT

As councilor for the Tri-County Medical Society, I beg to submit a report of its activities for the fiscal year June 1, 1931 to June 1, 1932.

Since the last state meeting in Aberdeen in 1931, the Tri-County Medical Society has held six meetings either in New Rockford, Carrington, Fessenden, or Harvey. Once we went out of the district to McClusky as a courtesy to Doctor Alger who since has left for Europe to study. Of the twelve members residing in the Tri-County district in this period, ten of them were habitually present almost always; two members were habitually absent at these meetings. Drs. L. J. Alger and R. J. Critchfield have left us in the course of the last year, the former going to Europe for study, while the latter located in Fargo. Fifty per cent of the loss of this membership was made good by the joining of Dr. H. LaPointe. Every member in the district paid in his 1932 membership dues.

For some reason or other, our society did not get much into case reports, discussion of diseases, etc., but instead occupied its time discussing some such subjects as the following: Post graduate work, redistricting the state (all members voting against this proposal), medical legislation, hospitalization and medical care of the World War veterans, medical care of the poor, Basic Science Law (all in favor), collections, depression, and the Eighteenth Amendment.

Respectfully yours,

(Signed) J. J. SEIBEL, M.D., Councilor.

#### TENTH DISTRICT

The Councilor for the Tenth District begs to submit the following report: During the year we have had six meetings, all of which were interesting and well attended. One of these was a joint meeting with the Eastern Montana Medical Society, and was held in Glendive. Each meeting was held in a different city, so that each member of the Society would be able to attend at least one meeting during the year, without having to drive any great distance.

Of the thirty practicing physicians in the district, who are eligible to membership, twenty-seven belong. We had hoped to be able to report 100 per cent membership, during the year, but did not quite make it. We have lost no members during the year by death or removal. One new member has been gained and two have been lost by non-payment of dues.

During the year we have purchased a Bausch and Lomb Lantern for the projection of slides, pictures or opaque objects, and find that this adds a great deal to our meetings.

We are working on a plan of Group Life Insurance, for the members of our Society. At present we have nothing definite to report, but we believe it is feasible and will save the members considerable money.

The usual perfect harmony and good fellowship continues to prevail at all our meetings. We did not mind the depression very much, until the hard times caught us, but the morale of the members has kept up and we have not found it necessary to cut fees.

In spite of the stress of financial conditions and the increased threat of the cults and fads, we are determined that the science of medicine must advance; that the practice of medicine has become indispensable to the human welfare, and that the physician and surgeon must not fall short in his duty to the science and practice of medicine, regardless of unfavorable circumstances or opposition.

Respectfully submitted,

(Signed) A. E. SPEAR, M.D., Councilor.

Upon motion regularly seconded and carried these reports were accepted as read.

#### REPORTS OF SPECIAL COMMITTEES

*Committee on Medical History*—Dr. George M. Williamson stated that he had no formal report, but he understood that Dr. Grassick had collected considerable more material concerning the history of medicine in North Dakota. He felt that some movement should be made to place this in manuscript form at least, so that at some future time an additional volume could be published of the excellent history Dr. Grassick had prepared.

Discussion on this question was postponed until a later meeting.

*Committee on Necrology*—Dr. James Grassick presented the following report:

#### NECROLOGY REPORT 1931-1932

House of Delegates, North Dakota Medical Association:

We are again called upon to pay our tribute of respect to those of our number who, since last we met, have entered that other realm; and to place a minute on our records that those coming after may learn that they lived with a purpose, loved their profession and labored earnestly for the betterment of humanity.

DANIEL D. MURRAY, M.D.

Dr. D. D. Murray was born 1857 at Ross Point, New York State and died at Duluth, Minnesota, November 9, 1931.

Dr. Murray graduated from Albany Medical College in March, 1881, and began the practice of medicine at Mayville, Dakota Territory in 1883. Here he remained until 1891 when he moved to Duluth, Minnesota. He was a charter member of the North Dakota Medical organization at Larimore in 1887, and the last to leave us of the original six who visioned the coming day. For this reason, although living for many years in another state, we give him a place on our honor roll.

A Duluth paper had this to say of him: "Dr. D. D. Murray had been an active figure in the professional, civic and political life of the community for more than forty years. He made himself felt through the great-

ness of his heart and his boundless capacity for friendliness."

TIMOTHY O'BRIEN, M.D.

Dr. T. O'Brien was born at Brudevall, Ontario, March 17, 1861, and died at his home in Wahpeton, North Dakota, November 7, 1931. He received his preliminary education in the schools of his native country and his medical education at McGill University, Montreal, from which institution he graduated in 1883. After practicing for a few years in Ontario he came west and settled in Wahpeton, Richland County, in 1887, where he remained until his death. It will thus be seen that he just lacked two years of completing a half century of active practice.

Dr. O'Brien, during his forty-four years of residence and of service in the city of Wahpeton, had watched with keen interest its growth and development. He contributed freely of his time, talents and substance for community welfare and was ever ready to give the best he had for the relief of human suffering and the good of the people among whom he so faithfully labored.

Dr. O'Brien was prominent in medical circles of the State. He was one of the organizers of the Richland County Medical Society and was its President at the time of his death. He was also an active member of the Wahpeton Board of Health. He leaves to mourn his passing, a widow and four children. Of the latter, Veronica and Louis are students in the medical department of the University of Minnesota. Thus was laid away in the gloaming of life a worthy representative of our pioneer physicians.

CHARLES E. BENNETT, M.D.

Dr. C. E. Bennett was born in Menomonie, Wisconsin, in 1858 and died at his home in Aneta, North Dakota, 1931. His father, Richard Bennett, was French Canadian, and his mother, May Snively Bennett, of Moravian descent. Dr. Bennett received his education in the public schools of Menomonie, Wisconsin, and later in the University of Wisconsin, Madison. He graduated in medicine from the University of Minnesota in 1895, and came to North Dakota in 1896 and was licensed in the state April 15, 1897. He established a practice at Aneta, Nelson County, where he lived until his death. He was a splendid type of the country Doctor who considered it a privilege to serve. Every case that came to him was accounted a sacred trust and received the best of which he was capable. A call to him was an imperative order, and blinding rain, unmarked trail, biting storm and blackest night were unflinchingly faced in answering it. He was public spirited and took an active interest in community affairs. He was Mayor of his home city for three years and held the office of Vice-President of the State Board of Health from 1907 to 1913. His philosophy of life was summed up in: Honesty in dealing with his fellowmen, loyalty to his country and its institutions and service in the cause of human welfare.

## JOHN C. SMITH, M.D.

Dr. J. C. Smith was born at Southmont, Ontario, December 28, 1855, and died at his home in Thompson, North Dakota, December 26, 1931, lacking two days of completing seventy-six years of life.

He graduated from Victoria College and Toronto University, Canada, in the Spring of 1887, and immediately located at Thompson, Dakota Territory, where he continued to practice his profession almost continuously until his death.

Dr. Smith was a worthy representative of that group of pioneer physicians who in the full flush of young manhood came to Dakota before Statehood and did their day's work on its prairies. He was a fine type of the family physician, whose ranks in late years have been so greatly depleted. He lived among and for his people. He counseled the erring, guided the wayward, relieved the ailing and pointed the way to the better things of life. His name and memory are fittingly preserved in the hearts of those he so unselfishly served.

## HEZEKIAH JOHN ROWE, M.D.

Dr. H. J. Rowe was born in Pennsylvania, March 7, 1848, and died at his home in Minneapolis, Minnesota, November 20, 1931.

At the age of seventeen he enlisted as a private in Co. D. 100 Pa. Vet. Vol. After his discharge he entered the teaching profession and later that of medicine. He graduated from Jefferson Medical College, Philadelphia, Pennsylvania, in 1876. In 1879 he heard the call of the West and answered it, settling in Casselton, Territory of Dakota, at which place he practiced his profession for forty consecutive years. While serving his community as physician he found time to give constructive leadership in the development of the new country. He served for two terms in the State Senate and had the honor of introducing the first bill in the Senate of the new state of North Dakota. He was a member of the North Dakota Medical Examining Board for a number of years, was President of the North Dakota Medical Association, 1900-01, and for nineteen consecutive years was its Secretary. He had the knack of picking out and recording the salient points of a meeting, making his minutes concise and yet complete. This faculty, together with that of organization, made him an outstanding figure in the professional and fraternal life of the State. Where problems of rights or ethics were in dispute, Secretary Rowe always seemed to have the solution that would maintain the dignity of the organization, and at the same time reduce the friction to a minimum. As the World War with all of its harrowing experiences came to us, vivid memories of the Sixties made his yearning pulse of action beat strongly, and he again offered himself to serve in whatever capacity he could best fill.

Dr. Rowe was a delightful companion, a loyal and public-spirited citizen, a respected and honored member of the profession he loved so well, a genial and versatile attendant at social gatherings and with it all a consistent Christian gentleman. When the final history of North Dakota is written an illuminating chapter will have as a heading, "Dr. H. J. Rowe."

## W. J. STOCK, M.D.

Dr. W. J. Stock was born at Belville, Illinois, April 2, 1884, and died December 15, 1931, at the Veterans Hospital, Fort Snelling. He was a graduate of the Medical Department of the University of St. Louis, St. Louis, Missouri, and began the practice of medicine in Waconia, Minnesota. He later moved to Galacia, Kansas, where he remained for six years. He came to North Dakota in 1927, and located at Strasburg, Emmons County, where he made his home until his death.

He enlisted during the World War in the Medical Corps of the United States Army and spent two years overseas. The illness that caused his death was contracted in line of duty, an incident in the aftermath of war whose blight, like a curse of the gods, follows us to the bitter end. He leaves a widow and three sons, two of whom are students at the University of North Dakota.

## HUGH SPAULDING WILLSON, M.D.

Dr. H. S. Willson was born in Plainview, Minnesota, and died at his home in La Jolla, California, December, 1931, aged 54 years. He came to North Dakota with his parents in 1879. He attended the University of North Dakota and graduated in medicine from the University of Minnesota in 1905, and was licensed in North Dakota, October 12, 1905. After graduation he practiced for some time in Minneapolis and later moved to Crystal, North Dakota, where he remained for six years. During the World War he served in the Medical Corps, taking his training at Camp Kearney, California. He went overseas in 1918 and was advanced to Lieutenant Colonel and given charge of a hospital in France. On his return he began practice in Minneapolis, but the stress and strain of work at the front was too much for him and he retired and went to La Jolla, California, where he remained until his death. One more gone for Country's sake and laid away, not in Flander's Field, but by the poppy decked hillsides of sunny California. May we who remain, carry on,

".....till Earth and Sky  
Shall echo Peace o'er those who lie,  
Where Poppies blow."

Respectfully submitted,

(Signed) JAMES GRASSICK, M.D., Committee on  
Necrology.

Dr. Grassick moved the adoption of this report. The motion was seconded by Dr. Paul H. Burton and unanimously carried.

REPORT OF COMMITTEE ON  
PUBLIC HEALTH

In the unavoidable absence of Dr. A. A. Whittemore, Chairman, the following report was presented by Dr. B. K. Kilbourne:

The following report on public health is respectfully submitted:

The general health of the State has been exceptionally good during the last year. No outstanding epidemics have occurred. Smallpox, however, has been noticed as unusually prevalent in the southeastern por-

tion of the State and diphtheria in McLean County. Neither of these outbreaks could be said to be of a serious nature.

The drought area has been markedly free from preventable diseases, though a recent survey shows a small percentage of undernourished among the children.

The number of births reported for the State during 1931 is 13,939; 5,092 deaths were reported with 405 still births.

The influence of the general financial depression and drought has had no special influence on the causes of death except in the large number of suicides. There were seventy reported in 1930, showing an increase of twenty-four over the previous year. The figures for 1931 are not yet available.

The major project of the health department during the past year has been the active immunization of the school and pre-school children of the State. Special credit must be given to the physicians, local health officers and American Legion Auxiliary for their co-operation and assistance.

During the last nine months a generalized public health project has been completed. Among other things, approximately 30,000 school and pre-school children have been immunized against diphtheria, 25,000 against smallpox, and 5,000 against typhoid fever, making about 85 or 90 per cent immunization against one or all of these diseases over the territory covered. Toxin anti-toxin and toxoid were used for about equal numbers. It is expected that the exclusive use of toxoid will be recommended by the health department in the future. About 10,000 diphtheria immunizations have been reported by county health officers throughout the State independent of this project. The physicians of the State have co-operated in splendid shape. It is generally felt that immunizations have been greatly popularized. It is hoped that the physicians of the State will find it possible to follow up this advantage by the immunization of the new crop of children at least every two years.

Outside subsidies have been obtained for this and other health work by the department to the extent of about \$40,000.00.

The general and indiscriminate determination of the people to reduce taxes due to our recent financial depression is apt to wreck the splendid foundation of public health and disease prevention which has taken twenty years to build if something substantial is not done to prevent it. It is probably more important to have a properly functioning health department during these times of stress, reduced standards of living, undernourishment, jeopardized water supply, etc., than at any other time. It must be admitted, however, that taxes are really too high, but a well-balanced retrenchment is certainly essential.

Respectfully submitted,

(Signed) A. A. WHITTEMORE, M.D., Chairman,  
B. K. KILBOURNE, M.D.,  
H. E. FRENCH, M.D.,  
G. F. DREW, M.D.,  
S. A. ZIMMERMAN, M.D., Committee.

Dr. Kilbourne moved the adoption of this report.

The motion was seconded by Dr. Sihler and unanimously carried.

*Committee on Military Affairs*—Dr. Lee B. Greene, Chairman, made the following verbal report:

I have nothing of importance to report but wish to urge every member of the Association who holds a reserve position in the Medical Reserve Corps to keep up his commission and not permit it to lapse.

Dr. Greene moved the adoption of this report.

The motion was seconded and unanimously carried.

*Committee on Scientific Program*—Dr. R. D. Campbell presented the program for the annual session and moved that this be accepted as the report of this committee.

The motion was seconded and unanimously carried.

## MISCELLANEOUS BUSINESS

### COMMITTEE ON JOURNAL

DR. N. O. RAMSTAD, Bismarck: At the last meeting of the Society the Council appointed Dr. Drew, Dr. Wicks and myself to investigate the relative merits of the Journal-Lancet and Minnesota Medicine as the journal to represent this Association. The Committee thought that possibly the other members of the House of Delegates might be kind enough to give us some assistance and advice in this matter. Your Committee has had a number of meetings but we felt that the matter is too large for the three of us and that the best we could do was to obtain a definite offer from both journals and submit them to every society in the State, in order that the members of the State Association might have some definite idea of this matter. The Council undoubtedly will consider this question tomorrow and I am sure we would be very glad to have the advice and support of the House of Delegates.

We feel that the Journal-Lancet has made great strides during the past year, and while there are some things to criticize the Committee feels that great progress has been made.

### AUTOMOBILE ACCIDENTS

DR. H. A. BRANDES, Bismarck: I have a matter which Dr. LaRose requested me to bring before you, relative to the formulation of a bill providing for a lien for hospital physicians and nurses for the care of patients following automobile accidents. I have here a copy of a bill presented by the State of Montana which seems

to be a pretty good thing. The matter can be referred to a committee if you wish.

DR. BRANDES: If this matter is to be presented to the Legislature would it not be well to have some figures to present? In Bismarck I looked up this matter some time ago and asked the hospitals there to keep a record of the bills for services following automobile accidents for six months in order to get some figures. I am informed that in Ohio the hospitals lost something like \$375,000 during the year because of nonpayment for services following accidents. Of course any hospital can keep such records and it would be well to submit the facts to the Legislative Committee.

THE PRESIDENT: I think your point well taken, Dr. Brandes, and if every member of the House of Delegates will keep this in mind and have such records kept it will be very helpful to present to the next Legislature. It is very difficult when we do not have the information we need, and everything to be used for legislation should be gathered beforehand. If our Committee has the material by January 1st I know it will be a great help.

DR. G. WILLIAMSON: I move that a committee be appointed with Dr. Brandes as Chairman to take this up with the various clinics and hospitals throughout the State for accumulation of the data in time to be used at the next meeting of the Legislature, in January, 1933.

The motion was seconded by Dr. H. F. Emert and unanimously carried.

The President stated that he would announce the personnel of the committee at the next meeting of the House of Delegates.

Dr. Williamson moved to adjourn and that the next meeting of the House of Delegates he held at 12:30 p. m. Wednesday.

The motion was seconded and the House of Delegates adjourned at 9:45 p. m., to reconvene at 12:30 Wednesday, June 1.

## SECOND MEETING

WEDNESDAY, JUNE 1, 1932

The second meeting of the House of Delegates was held at the Dakotah Hotel and was called to order at 12:45 p. m. by the President, Dr. Henry M. Waldren, Sr., Drayton.

## ROLL CALL

Secretary Skelsey called the roll and the following Delegates, Councilors and Officers responded:

Drs. A. E. Spear, A. P. Nachtwey, J. J. Seibel, C. R. Tompkins, G. M. Williamson, H. F. Emert,

R. H. Breslin, G. F. Drew, Lee B. Greene, N. O. Ramstad, E. A. Pray, Murdock MacGregor, H. A. Brandes, Frank I. Darrow, W. W. Wood, W. H. Cuthbert, J. L. Devine, Paul H. Burton, T. H. Lewis, F. L. Wicks, John H. Moore, H. E. French, John Crawford, A. F. Hammargren, W. C. Fawcett, E. M. Ransom, President H. M. Waldren and Secretary A. W. Skelsey.

The President declared a quorum present and the House duly constituted for the transaction of business.

## REPORTS OF COMMITTEES

### REFERENCE COMMITTEE ON SECRETARY'S REPORT

Secretary Skelsey presented the following report which had been submitted by this Committee:

#### MEDICAL ECONOMICS

The Committee recommends that in its opinion the best way to handle this subject would be to request the Committee on Scientific Program for next year's annual meeting to arrange for a well qualified speaker to address the Association on the question of medical economics.

(Signed) G. F. DREW, M. D. Chairman,  
C. R. TOMPKINS, M. D.  
L. W. LARSON, M. D.

Dr. J. W. Bowen moved that the report be accepted.

The motion was seconded by Dr. A. P. Nachtwey.

Dr. G. M. Williamson offered as an amendment that the President appoint someone in each District or each County to carry on this work and recommend to the Councilor of the District.

This amendment was seconded by Dr. Paul H. Burton.

Dr. Bowen accepted the amendment and the motion as amended was put to a vote and unanimously carried.

### PETITION INITIATED BY THE NATIONAL ECONOMY COMMITTEE OF NEW YORK (19 WEST 44TH STREET) ADDRESSED TO THE PRESIDENT AND THE CONGRESS OF THE UNITED STATES REFERRED TO IN SECRETARY SKELSEY'S REPORTS

We recommend \* \* \* that a committee be appointed consisting of one man from each District to contact the suitable men of local Taxpayers' Associations in the respective territories. \* \* \*

G. F. DREW, M. D.,  
C. R. TOMPKINS, M. D.,  
L. W. LARSON, M. D., Committee.

In a discussion of the preceding subject it was the judgment of those present that Secretary Skelsey procure copy of the petition, to be transmitted to the Councilor of each District for such action as might later seem proper to him.

#### REPORT OF COMMITTEE ON MEDICAL EDUCATION

Dr. H. E. French, Grand Forks, Chairman, presented the following report:

To the House of Delegates, North Dakota State Medical Association:

Your Committee on Medical Education would report as follows:

The School of Medicine at the University continues to operate as a two year or half school in the plan familiar to you. Facilities compel it to limit its beginning class to about thirty, but this number seems to take care of all well qualified applicants from this state and usually for a few others. The second year class finishing at this time numbers twenty-seven. One of these will be unable to continue his work at present for financial reasons; the other twenty-six are all placed for next fall in good clinical schools—thirteen at Rush, four at Northwestern, one at Harvard, one at Pennsylvania, and one at Jefferson, and two each at Nebraska, Washington University and Louisville.

In regard to popular health education the Committee knows of the broadcasting each week over KFJM by the Chairman, it knows indirectly of similar work from time to time by health officers, and of bulletins by similar agencies, particularly of the quarterly report of the city health officer of Fargo and of literature of the Tuberculosis Association. During the year a request for authorization to broadcast on the part of a practitioner in the State was referred to the Committee. Since investigation on the part of the member of the Committee residing in the place where the broadcast was to take place indicated that this request should not be granted, no further action was taken. The Committee, however, would recommend that either the councilors in each district or a special committee appointed in each district be authorized to pass upon any such requests and to have over-sight over any broadcasting in their respective territories.

Respectfully submitted,

(Signed) H. E. FRENCH, M.D.,  
G. M. WILLIAMSON, M.D.,  
N. O. RAMSTAD, M.D.,  
C. R. TOMPKINS, M.D.

Dr. French moved the adoption of this report.

The motion was seconded by Dr. A. D. McCannel and unanimously carried.

#### AUDITING COMMITTEE

Dr. G. F. Drew made the following verbal report:

Mr. President: Your Auditing Committee has examined the records and found all books of the Treasurer correct as submitted.

Dr. Paul H. Burton moved the adoption of this report, and of the report of the Treasurer.

The motion was seconded by Dr. Lee B. Greene and unanimously carried.

#### PUBLIC POLICY AND LEGISLATION

Dr. W. C. Fawcett, Starkweather, gave the following verbal report:

Dr. LaRose is Chairman of this Committee but he is unable to be present to make the report.

Under guidance of Dr. Waldren there was maintained in Bismarck a room with a stenographer in attendance to help with reports and so forth. I think a great deal was accomplished. Many harmful bills were killed. The registration bill was put over almost unanimously, and only one bill was lost—our educational bill. In some recent correspondence with men who were on that Committee some suggestions are made. Dr. LaRose is probably better versed in the machinery and the proper lobbying than any other physician in the State and he has made some valuable suggestions, particularly regarding necessary action concerning the care of persons injured in automobile accidents.

I move the adoption of this report.

The motion was seconded by Dr. A. E. Spear.

The report was discussed by Drs. Williamson, Darrow, Burton and Ramstad, following which the motion to adopt was put to a vote and unanimously carried.

#### UNFINISHED BUSINESS

##### APPOINTMENT OF COMMITTEES

*Committee to Collect Data*—The President appointed to work with Dr. H. A. Brandes, Chairman, Dr. W. H. Long, Fargo; Dr. R. W. Pence, Minot.

*Committee on Nominations*—The President appointed as the Committee on Nominations, Dr. H. F. Emert, Sarles; Dr. A. P. Nachtwey, Dickinson; Dr. T. H. Lewis, Fargo.

THE PRESIDENT: Is there anything anyone wishes to bring up before we adjourn?

DR. R. H. BRESLIN: The Kotana District for some time had the idea that we were under the wing of the Fourth District, but today I found this is not true. We are 125 miles from Minot and it is difficult to have any contact. I am acquainting you with the fact that there has been an influx in our part of the country of several young and interested medical men. We have twelve meetings each year and the hospital staffs hold meetings each month, so you can see that we are a live group.

I move that an Eleventh District be created under the North Dakota State Medical Associa-

tion, and that due measures be taken to appoint a Councilor from that District.

The motion was seconded.

DR. E. M. RANSOM: A few years ago I represented as Councilor both the Kotana and the Fourth District Societies and I am sure that the House took action that Kotana was entitled to their own representation, but I think nothing more than that was done. I think we should take care of this now and not wait for a year.

President Waldren read that portion of the Constitution relating to the formation of the Council and stated that in order to take care of this question it would be necessary to act in accordance with Article XIII.

DR. H. E. FRENCH: I believe we should think of this as a motion to amend so that it can come up next year. I would suggest that as a matter of courtesy a tentative councilor can be chosen.

DR. BRESLIN: I am in favor of this suggestion, acquainted as I am with the affairs in my part of the State. We are on the far border and it is easy to forget us, but we have come to life recently and have taken some active part in the progress of medicine in the State. I feel that to some extent it would be a dampener to our enthusiasm if we have to wait a year before we can get recognition, the same as other State bodies have. I am sure that on behalf of the Kotana Medical Society I can express our appreciation of this courtesy if it is extended to us.

THE PRESIDENT: While I feel very sympathetic toward that Society I do not feel that our Constitution should be used as a set of By-Laws would be. I think we should adhere to it. If we start a precedent we might as well tear up the Constitution.

DR. BRESLIN: I desire that my remarks be considered as serving notice of a proposed change in the Constitution.

DR. T. H. LEWIS: I would suggest that when this change is being considered Article XIII be amended to read "ten or more Councilors" so that if anything comes up in the future it will not be necessary to change it again.

DR. FRANK I. DARROW: I move that the question of revision of the Constitution in regard to redistricting be submitted to a committee, to report at the next meeting of the House of Delegates.

The motion was seconded by Dr. J. J. Seibel and unanimously carried.

The President appointed to serve as such

committee, Dr. H. E. French, Grand Forks; Dr. A. W. Skelsey, Fargo; Dr. P. G. Arzt, Jamestown.

On motion regularly seconded and carried the House of Delegates adjourned at 1:45 p. m. to reconvene at 12:30 p. m., Thursday, June 2.

### THIRD MEETING

THURSDAY, JUNE 2, 1932

The third meeting of the House of Delegates was held at the Dakotah Hotel, Grand Forks, and was called to order at 1:10 p. m. by the President, Dr. Henry M. Waldren, Sr., Drayton

### ROLL CALL

Secretary Skelsey called the roll and the following Delegates, Councilors, and Officers responded:

Drs. Frank I. Darrow, T. H. Lewis, H. F. Emert, J. H. Moore, C. R. Tompkins, R. H. Breslin, J. L. Devine, C. J. Meredith, L. W. Larson, H. A. Brandes, A. P. Nachtwey, Joseph Sorkness, W. H. Cuthbert, A. E. Pray, James Grassick, H. B. Huntley, W. F. Sihler, Murdock MacGregor, G. M. Williamson, E. M. Ransom, N. O. Ramstad, Lee B. Greene, A. E. Spear, H. E. French, Paul H. Burton, J. W. Bowen, C. E. Stackhouse, A. D. McCannell, W. W. Wood, President H. M. Waldren and Secretary A. W. Skelsey.

The President declared a quorum present and the House of Delegates duly constituted for the transaction of business.

### REPORT OF NOMINATING COMMITTEE

Dr. H. F. Emert, Chairman, presented the following report:

The Nominating Committee beg to submit the following report:

President, Paul H. Burton, M.D.....Fargo  
 President-Elect, Jesse W. Bowen, M.D.....Dickinson  
 First Vice President, C. E. Stackhouse, M.D...Bismarck  
 Second Vice-President, A. D. McCannell, M.D....Minot  
 Secretary, A. W. Skelsey, M.D.....Fargo  
 Treasurer, W. W. Wood, M.D.....Jamestown  
 Delegate to A. M. A., A. W. Skelsey, M.D.....Fargo  
 Alternate Delegate to A.M.A.....  
 W. C. Fawcett, M.D.....Starkweather

### COUNCILORS

First District, Murdock MacGregor, M.D.....Fargo  
 Third District, G. M. Williamson, M.D....Grand Forks  
 Sixth District, N. O. Ramstad, M.D.....Bismarck

## STATE BOARD OF MEDICAL EXAMINERS

George M. Williamson, M.D.....Grand Forks  
 W. F. Sihler, M.D.....Devils Lake  
 P. G. Arzt, M.D.....Jamestown

Respectfully submitted,

(Signed) H. F. EMERT, M.D., Chairman,  
 A. P. NACHTWEY, M.D.,  
 T. H. LEWIS, M.D.

Dr. H. F. Emert moved that the rules be suspended and that the Secretary cast a unanimous ballot for these nominees.

The motion was seconded by Dr. E. M. Ransom and unanimously carried.

Dr. Skelsey reported the ballot cast and the President declared these gentlemen duly elected.

## PER CAPITA TAX

Dr. G. M. Williamson moved that the annual dues remain as at present.

The motion was seconded by Dr. J. H. Moore and unanimously carried.

## SELECTION OF MEETING PLACE

Secretary Skelsey read a letter which had been received from the Chamber of Commerce of Mandan inviting the Association to meet in that city in 1933.

Dr. Paul H. Burton, on behalf of the Cass County Medical Society, invited the Association to meet in Fargo in 1933.

Dr. C. J. Meredith, on behalf of the Sheyenne Valley Medical Society, extended an invitation to the Association to meet in Valley City in 1933. This invitation was warmly seconded by Dr. A. E. Pray.

Dr. W. W. Wood stated that the Seventh District had intended to invite the Association to meet in Jamestown in 1933 but had withdrawn their invitation in favor of Valley City.

The President stated that he would entertain a motion designating the place of meeting.

Dr. G. M. Williamson moved that, in view of the numerous invitations, the meeting place be selected by ballot.

The motion was seconded by Dr. E. M. Ransom and unanimously carried.

After the ballots were counted the Secretary announced that Valley City had received the highest number of votes and President Waldren declared that City to be the next meeting place.

## NEW BUSINESS

DR. H. A. BRANDES: For the past five or six years I have had the privilege of representing our Society at the annual meetings of our State Association, and during the last several years it has seemed to me that we are not giving

sufficient time to the business of the Association. There are many problems confronting the profession now and sometimes I think we are somewhat indifferent to them. Many reports are presented which contain suggestions which we do not have sufficient time to consider, for instance, our relation to the public, the press, the radio, and our relationship to the legislators. Time does not permit me to enumerate them all, but I present this as constructive criticism of the organization.

I move that the House of Delegates convene at 2:00 p. m. on the day preceding the first day of our annual session.

The motion was seconded by Dr. G. M. Williamson and unanimously carried.

President Waldren stated that this plan had been in his mind for the entire year, and urged that each of the component societies devote at least one meeting to the discussion of medical economics.

Dr. Skelsey stated that efforts were made at the last annual meeting of the American Medical Association in New Orleans to have either a semi-annual meeting of the House of Delegates with the Board of Trustees of that organization for the consideration of their various activities; or meet one or two days prior to each annual session.

## REPORT OF COMMITTEE ON REDISTRICTING

The Secretary presented the following report:

It is the opinion of the Committee that it is not now advisable to increase the number of Councilors.

It is suggested, however, that a committee now be appointed, to report at our next Annual Session, to consider a plan of combining or redistricting the State based upon the total present number of ten (10) Councilors.

(Signed) H. E. FRENCH, M.D.  
 P. G. ARZT, M.D.  
 A. W. SKELSEY, M.D.

Dr. Skelsey moved the adoption of this report. The motion was seconded by several.

DR. R. H. BRESLIN: As I understand it the objection to increasing the number of districts is because of the body becoming unwieldy. I think that is a negligible objection for the reason that we do not expect any marked increase in medical men in North Dakota within the next fifty years. In view of our interest and enthusiasm in regard to medical affairs we are entitled to representation by a Councilor. Inasmuch as I brought this to your attention yesterday, I hereby voice my objection to the report and to the motion that has been made.

DR. PAUL H. BURTON: I have talked with Dr. Wright of Minneapolis, who is here with us, and he tells me they found ten Councilor Districts unwieldy and are going back to nine.

DR. H. E. FRENCH: At the time we read over the Constitution and thought it over, and the more we thought of it the more we were convinced that this was the thing to do. You are aware how this body is made up—this is the legislative body and the elective body. It elects the Councilors. Who are the Councilors? They are the Board of Directors. One of their duties is to take care of financial affairs and problems of ethics. By the Constitution itself there is no objection to having the Councilors all from one place. We have thirteen societies and ten districts. I think we would be better off if we had a group of seven, but certainly it is a mistake to increase the number. No part of the State is without representation, and if a man at Williston is desirable he will, in time, be elected.

The motion to adopt the report of the Committee was put to a vote and carried.

#### REPORT OF DELEGATE TO AMERICAN MEDICAL ASSOCIATION

Secretary Skelsey presented the following report:

#### REPORT OF DELEGATE TO THE AMERICAN MEDICAL ASSOCIATION MEETING IN NEW ORLEANS, MAY, 1932

The House of Delegates opened on the morning of May 9th, in New Orleans. I had heard of the well lubricated machinery for the prompt transaction of business and there saw it exemplified. Dr. Warnshuis, of Michigan, the speaker presiding over the sessions, appeared impartial throughout all the meeting. A unique plan for keeping the delegates from straying away from the seats of duty was to compel every delegate personally to sign an individual attendance card at the opening of each session. Request was made that delegates urge upon the membership of their respective states to read carefully the records of the National Secretary and the National Board of Trustees, as well as other valuable material in connection therewith, that all members might realize the vast work of the national bodies and appreciate what had been done during the past year. This material covers over one hundred closely printed pages; much of it may be found in fairly recent seriatim numbers of the Journal A. M. A. I give below some extracts from the

handbook, in connection with the reports at the New Orleans sessions.

*Membership*—On March 1, 1932, a membership of 99,470. The A. M. A. Directory shows a total of 159,109 physicians in the United States and territorial possession. This directory list includes the active and the passive; the eligible and the non-eligible; also members of several groups which are engaged in teaching or in institutions for research, governmental service, etc. The National Secretary gave some very pertinent reasons why it has been difficult or impossible to add to our membership. National Secretary West, in response to some criticism that the membership should be larger, stated that there was some serious objection to the so-called membership drive; that quality should be the aim, rather than quantity plus some undesirable members.

*Our National Journal*—A gross weekly average of 94,470. The mailing list, January 1, 1932, was 90,717—a decrease of 2,380 compared with previous year period.

*Quarterly Index Medicus*—Is now taken over by the A. M. A. and its cost hereafter will have to be borne entirely by us. Attention is called to the fact that members of groups who have access to the Journal A. M. A. are also permitted to substitute therefor the Index Medicus or some other special journal of this Association. The loss on this Index in the year 1931 was \$29,533, slightly less than the loss in 1930.

Regarding other special A. M. A. monthly or quarterly publications, there was a net reduction of only 225 in the total circulation compared with the previous year; that is, in some cases a gain was offset by a loss. The excess of expenditure over income was \$21,397.

*Hygeia*—It is stated that this publication continues to hold the leading position as the one authoritative health periodical in the United States. It now yields a net modest income.

*The A. M. A. Directory*—Up to January 1, 1932, there were 7,992 copies sold. Income received was larger by \$3,724 than the operating cost.

*Co-operative Advertising Medical Bureau*—This you may recall is an organization sponsored by the A. M. A. looking to the distribution and a final diversion of net advertising receipts. There are now thirty-two state journals affiliated. North Dakota does not belong to this. Would become eligible by actually owning and controlling a state journal, and accepting the A. M. A.'s standard of so-called "ethical advertising." The net earnings

of this Co-operative Bureau were \$30,845, out of which these many state journals were allowed \$14,250, presumably on a circulation ratio. The A. M. A. got the net balance.

*The A. M. A. Library*—There were 7,901 copies of periodicals loaned to physicians and subscribers during the past year. In addition, 2,450 package libraries furnished to physicians during 1931; each package library contains from ten to thirty reprints and periodicals.

*Buildings and Equipment*—No decision to do any additional building, especially as some present inability to acquire one necessary piece of property.

*Bureau of Legal Medicine and Legislation*—Several Federal measures which require careful attention. The principal one was the World War Veterans' Relief Legislation. Various national conferences have been held on this subject. Our National Committee has received a friendly invitation from the American Legion to meet with them at their coming annual session in Portland, Oregon. The committee's report on the Shoulder's Plan: Agreed to the purpose and the purport of same, but recommended that the House of Delegates refer same back for further consideration.

It may not be amiss here to notice the views of at least one proponent for the governmental plan of continuing to build many hospitals for the Veterans. In answer to the question "What eventually will become of this hospital building plan?" the reply was: (1) It might lead to state medicine; (2) it would be useful in case of war.

The perennial topic of Federal maternal and child welfare legislation included in report of our National Committee.

*Medicinal Liquor*—Some so-called medicinal liquor bills have been pending in Congress, the purport of which would be to remove the restrictions imposed upon physicians with respect to the prescribing of liquor, and also permit the physicians to prescribe malt liquor for medicinal purposes. I do not know what final action has been taken, but with the heavy swing now against national prohibition it does not seem that for much greater length of time must physicians petition the national government for the professional privileges now requested in those bills.

*Bureau of Medical Economics*—Established during the past year. Aims to study all phases of economics bearing on medical practice. Your careful consideration is invited to its various reports, to be found at intervals in the Journal and in the Bulletin A. M. A. One of the affairs

brought into the limelight is the sordid subject of contract practice, showing in some cases how cheaply certain doctors and clinics have sold themselves.

*Committee on Foods*—This has been in existence a few years only. Doubtless those in charge of this type of work, which is of a regulatory and commendatory nature, consider it a useful appendage to the many activities of the A. M. A. During the past year 129 announcements of acceptances by the A. M. A. have been made; therefore the use of the official food seal of the A. M. A. has been permitted to the manufacturers. When we consider the great number of food preparations, fruits, fruit juices, many varieties of bread, chocolates, cocoas, ginger ale, sarsaparilla, etc., the question arises how many thousands of seals of merit eventually will be awarded for these varied products? Also, must the A. M. A. frequently go into the open market and purchase and test these articles, in order to ascertain that they continue to merit the coveted Association seal; in other words, for the benefit of the public should the Association stand sponsor for the manufacturer?

*Council of Pharmacy and Chemistry*—An item that may interest you is a reference to the endeavors of commercial advertisers to induce the medical profession to use intravenous therapy. The Council indicates by its report that for routine medication the oral or rectal route is safer and to be preferred.

#### HOUSE OF DELEGATES (Continued)

No friction this year about seating delegates. At a later session of the House, and in order to avoid troubles similar to that of the past few years, a new Standing Rule (No. 5) was adopted to make easier the acceptance of substituted delegates where the regular and alternates were not present.

Retiring President Judd discussed the question of full-time teachers in medical colleges. Does not consider such a plan as being entirely satisfactory. Suggests that in the matter of titles assumed as specialists, further inquiry and action be taken; it would be well to arrange for some standard system of classification.

President-elect Cary urges a committee of contact with the newly-created Bureau of Medical Economics. He questions whether the average physician fully appreciates the organized work of the A. M. A. Compares our National Journal with that of other nations, greatly to our credit in material and moderate price. Refers to the prob-

ably increased cost of postage due to the proposed national revenue law. Does not believe that the price of our Journal should be reduced. Mentions the necessity of considering a new building program for Chicago headquarters.

*Legislation Regarding Birth Control Data*—Motion was made that in view of the decided attention which is now being given this subject, a committee be appointed at this meeting and allowed a year within which to bring their report to our next annual meeting. It is not necessary here to discuss the arguments pro and con that are now being used in the press, magazines, pulpits, etc., and but scant attention was given thereto at this meeting. One speaker claimed that he did not believe the A. M. A. should intrude into the arena; that he considered it much more dignified to pay no attention or to pass any resolution appointing a committee. Another physician humorously remarked that the whole affair was so commonplace nowadays that in any city, any person, by dropping the requisite amount of money into any slot machine, could get any desired mechanical contrivance. I think he stated that such vending machines were even placed at all gasoline filling stations; that perhaps was "hyperbole." A motion to appoint a committee was *tabled*.

In separate session in New Orleans at the same time was being held the annual meeting of the Woman's Medical Association. The newspapers contained headlines to the effect that the assistant of Dr. Margaret Sanger, the very active proponent for birth control and for the removal of certain Federal restrictions, was in attendance and probably would urge the passage of resolutions along the lines suggested by Mrs. Sanger. Whether later such resolutions were passed, I do not know.

Recommended that the Association publish annually a book containing the medical-legal decisions running through the various issues of the Journal.

Decided not to reduce the price of the Journal from \$7.00 to \$5.00. However, the opinion was voiced that a reduction should be made as soon as feasible.

Complimentary introductions to the officers of the House of Delegates:

Dr. Paul Wolff, of Berlin, Germany, who brought greetings from the national organization of medicine in Deutschland.

The secretary of the Canadian Medical Association, who mentioned his appreciation of the work done by our national organization and also

expressed the hope that in the near future the A. M. A. would honor Canada by holding a session in the latter Dominion.

Dr. West, our National Secretary, read greetings from the British Medical Association. Expressed regret for not sending us an English delegate.

*Dual Membership*—There evidently have been some complications of this type. The one under discussion at this national meeting related to physicians located on state or county lines, maintaining separately residence and office within such dual territory. It is believed that for the purpose of efficient organization, jurisdiction over membership shall be definitely established. Would it be desirable for constituent associations to consider the advisability of amending their by-laws to provide that physicians residing on or near the state line may hold membership in the societies of adjacent states when jurisdiction over their membership has been officially waived by the societies of the counties and states in which they reside? Does *not* approve of dual membership. Suggests strict observance of present rules. (Of course, I understand that so far as North Dakota is concerned our occasional trouble has been due *not* to state lines but to the question of allowing members of component societies, after being properly released, to affiliate themselves with that society most accessible by automobile or railroad.)

Comment made that comparatively few of the United States Army and Navy service appear at our various meetings.

Some criticism of the activities of certain state boards of health in their zeal to obtain Federal financial aid.

General Patterson, of the United States Army, gave a forceful plea that our organization rescind a resolution passed at our last annual meeting, in Philadelphia, by which action our Association stated its preference for a certain location of the proposed new Army Medical Library in Washington, D. C. General Patterson mentioned that he and his associates felt that that resolution was passed under a misconception of the actual facts regarding the best location for that library. He insisted that the ideal location would be close proximity to the medical plant now being built up in Washington; that the site proposed by the army authorities was one directly across from the Walter Reid Hospital and other buildings later to be erected; that to permit the Army Medical Library to be absorbed by the Congressional Library would spoil the value of the Medical Library; gave his reasons therefor. In view of

the data presented by the General, the convention voted a resolution rescinding its action of last year, and now commending the plan presented by General Patterson.

Approved for printing in book form a new volume on Nomenclature.

*Committee on Public Relations*—Urged that all components and local societies come into closer contact with this national section. Some suggestions:

(1) Keep in close touch with the national organization.

(2) Strengthen the local organization.

(3) Activity on the boards of the various public relationships in the United States.

(4) The officers and trustees work in conjunction with the Women's Auxiliaries, in connection with local state and national societies.

Approves for admission to the A. M. A., internes in properly qualified hospitals; but *not* obligatory.

Urges that all state delegates render a complete report of this national meeting.

Reference Committee asks that all members making resolutions, as well as those opposed to such resolution, personally appear before such Reference Committee to give their views, in order that the Committee may give both sides due consideration.

Suggestions regarding a committee to study medical economics, state medicine, etc., in Europe. This has been gone over to some extent, but not very directly under the control of the Board of Trustees. Could this proposed committee now work in connection with our new Board of Medical Economics? (The American Dental Association, as well as the American College of Dentistry, recently have very thoroughly investigated such subjects in Europe as regard dental practice, and have kindly offered to share the information with the A. M. A.)

Upon the question of turning over certain work to nurses, midwives and technicians, the committee was decidedly of the opinion that we should keep the actual practice of medicine in the hands of physicians.

On Tuesday morning, May 10th, there were presented the Reference Committee's reports upon the annual reports of the Board of Trustees and the National Secretary. These two mimeographed papers, as read by Dr. Braasch, of Rochester, Minnesota, seemed quite innocent but caused some vigorous debate in afternoon session. The doves of peace took to the top of the palms in the hall, and the lambs and the lions went to it quite

vigorously, with a temporary victory for the latter. One could almost imagine himself in a convention of theologians with their exciting debates!

Urged that as regards the Bureau of Medical Economics and the large number of subjects contemplated for investigation, it is now suggested as preferable for the Bureau to possibly single out a few of the most urgent problems and pursue them to an immediate constructive conclusion. Also recommended that the personnel and the amount of financial support of the Bureau be augmented.

Reference Committee also recommends closer co-operation between the Board of Trustees and other officers with the House of Delegates. Is of the opinion that much benefit would accrue could it be so arranged that the House of Delegates and the Board of Trustees meet several days prior to the annual sessions, or through semi-annual meetings, and in this way permit of a better knowledge of and familiarity with the various activities of our Association.

Reference Committee highly commended Dr. West, National Secretary, and called attention to its former suggestion that, in view of the great amount to be done in his departments as secretary and manager, Dr. West be furnished an assistant.

Referred resolution: Regarding civil hospitals that could be used for the Veterans, and also the mention of the fact that a well-trained array of doctors and specialists could and would be glad to furnish available data to the Government, especially at this time, in regard to the wisdom of building many additional Federal general hospitals.

Referred resolution: The dropping by the Government of many medical officers.

On Thursday, May 12th, the election of officers. Dr. Dean Lewis, of Baltimore, was made president-elect, as against Dr. Cummings, of the United States Service, and Dr. Biering, of Iowa. Dr. R. Matas, of New Orleans, elected vice-president. The secretary, the treasurer and the speaker of the house succeeded themselves.

Milwaukee secured the convention for next year.

Concurrent with our meeting the Louisiana State Medical Society held its annual session in New Orleans, utilizing the A. M. A. program and exhibits for their material. The Orleans Parish Medical Society and the Louisiana State Medical were banquet hosts to the officers and delegates of the A. M. A. on Monday evening, May 9th. A pleasant remembrance.

Louisiana State University requested us to attend dedicatory exercises of the Medical Center in New Orleans, afternoon of May 10th. We were not able to accept the invitation, as our House of Delegates was in active and lurid session all that afternoon until five o'clock. Many of us have been accustomed to think of Tulane University with its School of Medicine as being so outstanding in New Orleans and that portion of the South that we are now inclined to wonder why the state of Louisiana must start an entirely new medical school in that city.

A. W. SKELSEY, M.D.,  
Delegate.

#### REPORT FROM COUNCIL

Dr. N. O. Ramstad, Chairman, presented the following report:

In accordance with the provisions of the Constitution of the North Dakota State Medical Association the report of the activities of the Council is hereby presented.

The Council chose the Journal-Lancet as the official journal for the Association for two years.

The following Associated Editors were re-elected: Drs. J. P. Aylen, Fargo; H. E. French, Grand Forks; A. D. McCannel, Minot; J. O. Arnson, Bismarck.

It was decided to assist Dr. Grassick in compiling material for a second volume of the Medical History of North Dakota by supplying him with the services of a stenographer for his work.

The financial transactions of the Association were audited by a Committee from the Council, Drs. Drew, Ransom and Spear, and the Treasurer's report was found to be correct.

The financial assets now consist of a One Thousand Dollar Liberty Bond and savings and checking accounts in a bank affiliated with the Northwest Bank Corporation, amounting to \$1,724.29.

Respectfully submitted,

(Signed) N. O. RAMSTAD, M.D.

Dr. Ramstad moved the adoption of this report.

The motion was seconded by Dr. G. M. Williamson and unanimously carried.

Dr. Ransom moved to adjourn.

The motion was seconded by Dr. Burton and the House of Delegates adjourned at 1:35 *sine die*.

A. W. SKELSEY, M.D.  
Secretary.

## PROCEEDINGS OF THE GENERAL MEETINGS OF THE NORTH DAKOTA STATE MEDICAL ASSOCIATION 1932

### FIRST DAY

WEDNESDAY, JUNE 1—MORNING

The first general meeting was called to order in Epworth Hall of the Methodist Church, Grand Forks, N. D., at 9:15 A. M., by the president, Dr. Henry M. Waldren, Sr., Drayton.

*Address of Welcome*—Dr. H. W. F. Law.

The President of the City Commission is not able to be present this morning and I have been asked to welcome you to our city. Grand Forks is very happy to have you here and we all hope you will enjoy every minute of your stay and feel at home. If we can do anything to add to your comfort please let us know.

*Response to Address of Welcome*—Dr. Frank I. Darrow.

Mr. President, distinguished citizens of Grand Forks: I came down here with the idea of enjoying this convention, but last night I was told that Dr. Aylen could not be here this morning and that I was to respond to the address of welcome from the Mayor, who, I understand, is a plumber, and I had several things all ready to tell you, but they have pulled another fast one this morning by substituting Dr. Law to welcome us, so I am high and dry.

However, we appreciate our welcome to Grand Forks. We are going to accept all the hospitality Grand Forks has to offer, and we appreciate very much the opportunity to meet here. We know this City is the center of learning in North Dakota and we all like Grand Forks. We all started our medical careers here, and we all had to go through Dr. Williamson's hands before we were permitted to start, and I remember very well the few days I spent here before them.

In speaking to a medical audience we often use different terms than in speaking to a lay audience, and I am not much of a talker. I recently asked my young daughter, who is studying Latin, "What is a monologue?" and she replied, "Conversation between you and mother."

We do appreciate very much your kind invitation to come here and the hospitality Grand Forks has offered.

## SCIENTIFIC PROGRAM

Dr. Owen H. Wangensteen, Minneapolis, gave a surgical Clinic and presented several interesting cases, the patients being supplied by Dr. R. D. Campbell, Charles MacLachlan, and H. G. Woutat.

Dr. R. C. Webb, Minneapolis, read a paper entitled, "Drainage in Appendicitis." Discussed by Drs. Edgar A. Pray, Valley City, and A. L. Cameron, Minot.

The meeting was declared adjourned at 11:15 a.m. to reconvene at 1:30 p.m.

## FIRST DAY

## AFTERNOON

The Association reconvened and was called to order at 2:10 p.m. by President-Elect, Dr. Paul H. Burton, Fargo.

Dr. Henry M. Waldren, Sr., Drayton, presented his Presidential Address.

The President then took the Chair and called for the report of the Annual Registration.

DR. G. M. WILLIAMSON: Mr. President, Fellows: I am particularly anxious to bring this matter to you this afternoon for the reason that our annual registration is new and this is the first opportunity we have had to come before you for suggestions. As you know, the registration is left in the hands of the Medical Examiners. That I think is one of the best plans and it works more satisfactorily in the states where they have it.

Dr. Williamson then read the following report.

#### HOW ANNUAL REGISTRATION OF PHYSICIANS IS OPERATING IN NORTH DAKOTA

G. M. WILLIAMSON, M.D.,

*Secretary, State Board Medical Examiners,  
North Dakota.  
Grand Forks*

From a paper, "The Present Extent and Value of Annual Registration," read before the Federation of State Medical Examination Boards in Chicago, by Doctor E. J. Engberg, Secretary of the Minnesota State Board of Medical Examiners, February 16, 1932, the following information was obtained:

"Doctor Engberg sent a questionnaire to the various State Boards. From 53 questionnaires sent, 50 replies were received; which indicates the interest in this important subject.

"California was the first to adopt an annual registration law effective in 1917; Louisiana in 1918; Connecticut and Idaho 1919; Iowa in 1924; New York and Pennsylvania in 1926; Nebraska, Oregon and Florida in 1927; Minnesota, Wyoming and Nevada in 1928; Colorado in 1929; North Dakota in 1931; Alaska, Georgia and Texas in 1932.

"Fees for annual registration vary from \$1 to \$10.

"Nine states have some form of occupational tax in connection with which an annual registration of physicians is effected. These are: Alabama, California, Delaware, Florida, Georgia, Mississippi, North Carolina, Utah and Virginia.

"Occupational taxes are from \$3 to \$75.

"The opinion expressed in all states possessing some form of annual registration is that it is of great help in law enforcement, through having an accurate list of all entitled to practice in the state.

"Law enforcement is further aided by the distribution of an annual directory to all licentiates, to various agencies, and particularly to law enforcement officers.

"Further assistance in law enforcement is provided where the registration fee is paid into a separate fund available for the use of the Medical Board."

Annual registration in North Dakota became effective July 1, 1931. Four hundred sixty-nine registered who were practicing in the state and seventy registered who had a North Dakota license and practiced outside the state. So far as I know, I was able to register every man practicing in the state.

The second registration was effective January 1, 1932, and four hundred seventy-three registered who practiced in the state and fifty-four registered from outside the state. In this second registration there is only one man in the state who has not registered.

Now I don't want to convey the impression that every fellow responded to the first notice I sent out. I wish they would. Letter after letter was written to some fellows and finally I would get results; usually a nice letter would accompany the check saying they had forgotten all about this registration. Now fellows, don't be neglectful, next December when I sent out notices of annual dues, get out the old check book at once and send in the dues; your neglect means extra work for me.

I said I had registered all in the state but one. This man has had a notice *via* registered mail.

The Board does not want to take any harsh means to make him pay his dues, but if he is holding back inviting trouble he will get it after July 1st, when the Board meets.

You will notice a slight difference in the number who registered in the state the second time. This is caused by new men who are licensed semi-annually and are added to the register; and deaths in the profession.

The reaction on the part of the profession to this new law has been splendid. I have had no complaints and have received some nice letters from men saying they were glad of the opportunity to pay the fee so that the Board would have funds to enforce the Medical Practice Act. It matters not how good a law is on the statute books; it is enforcement that counts.

We are proceeding cautiously. At the regular meeting in January, Judge H. A. Bronson was engaged as General Counsel and Advisor to the Board.

Judge Bronson, who follows me, will explain the law, what we have been doing since January 1932, and some of the difficulties we are encountering. We are laying a foundation for enforcement cautiously. All this takes time, and we must have the help and co-operation of every man practicing in the State in order to make law enforcement effective.

I said that I had received no complaints regarding annual registration. That is true; but I have had complaints regarding men who come into the state and begin practice before receiving a license. The expression of opinion I received is that the registration fee should protect men already licensed against that practice.

The law states that no man can legally practice in this state until he has been licensed by the Board of Medical Examiners. Temporary permits are not granted.

Heretofore this phase of the law has been rather loosely administered, and in fact men have been encouraged, especially by heads of clinics, to come to the state and begin practice before being licensed. The Board has tolerated that custom; but since the Annual Registration law has come into effect the Board finds that they must take a firm stand regarding this practice, and beginning July 1st this year, no person will be allowed to begin practice before he receives a license, and I am asking every member of this Association to help the Board to enforce this rule. No longer will be tolerated the excuse, "that men have been permitted to practice before being licensed," and "I did not know a new ruling had been made."

The new registration law states clearly that every person practicing must be registered. Besides it gives the Board funds to enforce its ruling, and this will be done.

#### REGARDING ENFORCEMENT

In October, 1931, Robert G. Errington, who operated a Nature Cure Hospital in Fargo, was successfully prosecuted. Doctors in Fargo were directly responsible for procuring evidence sufficient to convict this man. Special Counsel was employed to advise them.

I consider this an important case, as Errington had been "running wild" for some time in defiance of the Medical laws of the state. He came to North Dakota from Minnesota, where he had been convicted for similar practices.

I am asked occasionally about fellows who advertise in the Press that they will be at a hotel in certain cities where they can be consulted. They usually claim and recommend that surgical operations are unnecessary; that by taking their medicines, Gall Stones, Appendicitis, Goiters, etc., will be cured. These fellows may have a license to practice in North Dakota. The outstanding offender is Doctor Mellenthin; he was licensed January 12, 1911, before I became Secretary of the Board. His headquarters at present are in Los Angeles, California; were formerly in Minneapolis. This fellow paid his annual registration fee and retains the rights and privileges to practice in this state.

I would recommend that we try to have an Itinerant License Law enacted at the next session of the Legislature, not only covering the practice of Medicine but also taking in Itinerant Practitioners of all classes, e. g., fellows who come into the state fitting glasses, etc.

A number of states have Itinerant License Laws in effect. These non-taxed fellows take considerable money from people who cannot afford to lose it, yet the itinerant contributes nothing in the way of a tax.

Judge Bronson will tell you what we have been doing since January regarding law enforcement, and after his address any questions that are asked will be answered as intelligently as possible.

HON. H. A. BRONSON, Grand Forks: Mr. Chairman and Doctors: I am glad to be with you here today. You are not only regular in the light of ethics but you seem to be regular fellows. I should judge you are regular from what Dr. Williamson said about your payment of his license fee. It happens that

I was privileged in being present to draw the first act requiring registration of lawyers in the United States. For a while this raised a sort of protest among the lawyers of the state because it compelled them to be members of the State Bar, but as the time has gone along and other states in large numbers have followed the prototype of the North Dakota law it has been recognized that the law has been not only for the benefit of the lawyer, but of the law.

It also was my privilege to assist in the drawing of this Medical Registration Act, with the assistance of your able President, with the result that it became a law. This idea of annual registration that brings doctors into association, and lawyers into association, has behind it the fundamental idea of protecting the public, and there can be no question in fundamentals that the medical men are in favor of protecting the public, for there are no men with higher ideals than you have.

Judge Bronson then read the following report:

REPORT OF GENERAL COUNSEL FOR  
NORTH DAKOTA BOARD OF  
MEDICAL EXAMINERS

HON. HARRISON A. BRONSON,

*Formerly Chief Justice of Supreme Court of  
North Dakota*

The law of our state, covering the practice of medicine, recognizes several classes of persons who are entitled to diagnose or treat human ailments.

These classes are:

1. Licensed or commissioned physicians and surgeons. (A U.S. Army Doctor is a commissioned physician and surgeon.)
2. Licensed dentists.
3. Licensed optometrists.
4. Licensed osteopaths.
5. Licensed chiropractors.
6. Those practicing cults such as Christian Science or other religious forms of worship, devotion or healing, provided such do not administer or prescribe drugs, nor perform surgical or physical operations, or assume to be physicians or surgeons.

What is embraced within the term, "The Science of Medicine" or, what constitutes exercising the art of medicine is, of course, a subject matter that may cover a wide field of discussion as well as of debate.

Our statute, Section 463, Compiled Laws of

1913, sets forth what constitutes the practice of medicine.

It classifies a person as being engaged in the practice of medicine who does any of the following things:

*First*, who holds himself out as engaged in diagnosing or treating diseases or injuries of human beings.

*Second*, who offers, recommends or prescribes any form of treatment for the intended palliation, relief or cure of any physical or mental ailment with the intention of receiving directly or indirectly any fee.

*Third*, who maintains an office for the examination or treatment of persons afflicted with disease or injury of body or mind.

*Fourth*, who attaches the title M.D., Surgeon, Doctor, or any word or abbreviation to his name indicating engagement in treatment or diagnosis of diseases or injuries of human beings.

In addition, we have mentioned certain statutory provisions that cover nurses and also midwives, of which mention hereafter will be made.

Concerning dentists, the statute (Sec. 509, N.D. Supplement), in substance defines their practice as the performance of dental operations upon the human jaw, or the treatment of dental diseases or lesions thereof.

Concerning osteopaths, our statutes (Sections 516 to 523, N.D. Code 1913), only indefinitely define osteopathy and its practice.

Section 518 of the Code by inference gives the scope within which osteopaths may practice their profession when considered in connection with the Medical Practice Act, Sec. 463. Said Section 518 provides that the osteopathic Board shall examine an applicant to determine his fitness to treat the diseases of the human body according to the theory of osteopathy, which shall not include the prescribing of internal medicine. The presumption to be drawn is that, if the applicant is found qualified and is granted a license to practice as an osteopath, his practice will be confined to osteopathy as its founder and the law considers it to be.

The Medical Practice Act, Sec. 463, prohibits osteopaths from representing or assuming the title of physician or surgeon, and prohibits osteopaths from professing to administer or to prescribe drugs, and also prohibits osteopaths from performing surgery, except minor surgery.

In an opinion rendered to Dr. Williamson, Secretary of our Medical Board of Examiners, by Assistant Attorney General Shaft, dated April 5, 1932, Dr. Still, the discoverer and founder of

the practice, is quoted as follows: "Man's power to cure is good, at least insofar as he has knowledge of the right or normal position, and so far as he has the skill to adjust the bones, muscles and ligaments which give freedom to the nerves, blood, secretions and excretions," and "You, as osteopaths, can go no further than to adjust the abnormal condition in which you find the afflicted. Nature will do the rest."

It must be noted that the statute Sec. 518, provides that applicants to practice osteopathy must be examined in obstetrics. In a Minnesota case (*Stoke vs. Wiseman*) 208 N.W. 993, an osteopath brought an action to recover for his services rendered in attending childbirth. The question was raised whether an osteopath could practice obstetrics. It was held that there would be little reason for the Legislature to require an applicant to take a course in obstetrics and pass an examination on the subject if he should not be permitted to attend women in childbirth. The Court further said that if the Legislature intended to prohibit practicing obstetrics, it was fair to assume that they would say so in plain language, just as they otherwise prohibited osteopaths from prescribing drugs for internal use, or from performing major surgical operations. However, it must be assumed that so far as osteopaths practice obstetrics, they must practice it according to the tenets of osteopathy and must do so without prescribing or administering drugs, or performing surgery except minor surgery.

Concerning chiropractors, the statute (Sec. 523a4, N.D. Supp.) in substance confines their operations to the adjustment of any displaced tissues of any kind or nature. The statute prohibits chiropractors from prescribing for, or administering to, any person any medicine or drug now or hereafter included in *materia medica*, to be taken internally; it prohibits them from performing any surgery, except as stated (and none is stated in the Act); it prohibits them from practicing obstetrics; and from using the titles Dr., physician or surgeon.

Sec. 524, Compiled Laws 1913, provides for the licensing of optometrists. The practice of optometry in substance as defined is confined to measuring eye vision and applying objectively corrective appliances. The statutory definition is practically the same as that contained in Webster's International Dictionary.

Accordingly, all of the classifications above named; namely, physicians or surgeons, dentists, osteopaths, chiropractors and optometrists are required to be licensed under the law to practice

their art concerning the treatment of any human ailments.

There are two further classes, however, to be mentioned; namely, professional nurses and midwives. Professional nurses must take an examination under the statute (Sec. 506a9, Supp. to N.D. Code), and must be registered.

Midwives are mentioned in our statutes. One statute, (Sec. 449 C.L. 1913), requires midwives to be registered with the local registrar, such as the clerk of a township or city. Another statute, (Sec. 3168 C.L. 1913), requires a midwife to report if a child is born blind and whether prophylactic treatment known to medical science was given. Under date of April 7, 1932, in an opinion rendered to Dr. Williamson, Secretary of the Board, Assistant Attorney General Shaft holds that there is no statute which provides for an examination or licensing of midwives. The two sections mentioned above; requiring registration of midwives and reporting on child birth matters, are stated as insufficient, in his opinion, to indicate any positive legislative intention to permit the practice of obstetrics by midwives. His opinion, therefore, is that midwives attempting to practice their profession within this state, would be practicing medicine without a license.

Concerning the practice of medicine, it is well recognized that the state, under its police power for the protection of the public health, may regulate the practice of medicine and define the qualifications of those who profess to practice medicine. The leading case in our state is the case of *State vs. Miller*, decided by our Supreme Court in February, 1930, and found in 229 N.W., page 569. In this case the defendant, who claimed to be a naturopath practicing or using religious tenets, was convicted of practicing medicine without a license. Our court has held in that case that the term "practicing medicine" is not concerned with the efficacy of the remedy. Also, that when one diagnoses diseases and prescribes and applies any therapeutic agent as a remedy he is, in a broad sense, practicing medicine. The court further stated that the law is for the protection of the people in the matter of public health against the ignorant charlatan and imposter, and that the law is confined to the practice of medicine as a science and is aimed at those who profess *to be* what they are *not*. Further, it does not pretend to interfere with a nurse, a minister or a priest who furnishes his assistance, advice or instruction, or to interfere with the narration of the values of time-honored specifics. The court further said that whether a rem-

edy prescribed and furnished is harmless and has any effect whatsoever is not involved; that even a food may be a medicine if it be administered and employed for that purpose. Concerning the defense by the defendant, that he is a naturopath and that his actions were part of a religious worship, devotion and healing of the Seventh Day Adventists Church, the court said religious tenets cannot be used as a shield to cover a business undertaking.

Commencing in January, 1932, the Secretary and General Counsel of the North Dakota Board of Medical Examiners have considered some nineteen matters covering violations or reported violations of our Medical Practice Act. Four of these reported cover the practice of obstetrics by so-termed midwives involving also, in some cases, prescribing or administering medicine.

Dr. Williamson first proceeded to secure from the Department of the Attorney General in this state an opinion upon the rights of midwives to practice obstetrics or midwifery. Mr. Shaft, Assistant Attorney General, rendered an opinion to the effect that midwives attempting to practice obstetrics or their profession within this state, would be practicing medicine without a license.

Dr. Williamson, as secretary of the Board, has given much attention to the dispensation of narcotics heretofore permitted to osteopaths and chiropractors in this state. It appears that there were nine osteopaths who registered with the Collector of Internal Revenue, and by reason of such registration, were able or permitted to receive drugs such as opium or coca leaves and derivatives or preparations thereof. Complaint was made to the District Supervisor of the U. S. Narcotic Service and the response was that it was necessary to receive a more definite opinion from the Department of our Attorney General than had heretofore been received. Action was immediately taken by the secretary to secure a definite opinion from our Attorney General upon the right of osteopaths or chiropractors under our law to administer drugs, like opium or coca leaves or preparations or derivatives thereof. Opinion was received by Dr. Williamson to the effect that it was unlawful for an osteopath or a chiropractor to administer or prescribe the drugs above mentioned. Upon communication of this advice to the U. S. Narcotic Service, the District Supervisor advised that each of the registered osteopaths had been directed to surrender their special tax stamp on used official opium forms, and to make legal disposition of whatever narcotic drugs each may have on hand. We are awaiting advice

now from the District Supervisor that each of the osteopaths have complied and that the registrations of each have been cancelled by the Department.

We have just received advice from the Department of the Attorney General to the effect that the osteopaths are claiming that they have the right to receive and dispense these drugs under an opinion rendered by a former Attorney General. We have not located such opinion. However that may be, we are satisfied under the law, namely: the Medical Practice Act, that osteopaths have no right to prescribe or administer drugs of any kind. The law is specific and direct. We are, therefore, satisfied that the opinion of the Assistant Attorney General Shaft is based upon the proper interpretation of the law.

We have been devoting considerable attention to the operations of one, Gath, who, in an advertisement back in 1929, terms himself as a specialist in magnetic healing. He was formerly located at Rolette and Dunseith. It seems that he is now at Rock Lake. We have been considering the matter with the State's Attorney of Rolette County and with the State's Attorney of Towner County. Some of our advice is to the effect that this Gath has been acting in co-operation with another doctor who is licensed by our Board. One doctor wrote that he noticed the names of both parties on the same window and both had the prefix of "Dr." in front of their respective names. The State's Attorney of Towner County reports to us that this party has already served time in one county for violation of the liquor laws, and also was denied citizenship at a hearing held in that county. This matter is now being brought to a focus for direct action. Day before yesterday we received a report from one doctor that this party is now practicing medicine and prescribing drugs. The report is also made that four other doctors in the vicinity are co-operating and giving some attention to his operations.

We are glad to note, and are always glad to receive, the co-operation of local doctors in investigation and action concerning anyone violating the Medical Practice Act. For the first time, we have just now received specifically the name of one party who has been a patient of this man Gath, the child of whom was treated by Gath. This matter is particularly brought to your attention now for the reason that the Board will soon be faced with the question of determining what should be done with a physician and surgeon licensed as such, who aids and assists

one who is not licensed in violating the Medical Practice Act. We have authority to the effect that an unlicensed person may not practice under the wing of one who is licensed. Also, that a licensed person such as a doctor, who aids and abets an unlicensed person in practicing medicine, is equally guilty in violating the Medical Practice Act and his license is subject to revocation. (See *Gobin v. Oklahoma*, 131 Pac. 546, 44 L.R.A. [N.S.] 1089; *State vs. Paul*, 56 Neb. 369, 76 N.W. 861.)

We have also had under consideration the activities of four chiropractors within the state, involving violation of the Medical Practice Act.

One involved application by a chiropractor of a compound compounded as a tonic by the chiropractor himself and administered as such to a patient. The matter was considered with the State's Attorney of Mercer County. However, the chiropractor disappeared. His whereabouts just now are unknown. The last heard of him he was in a foreign state.

Another one has been treating a contagious disease, but we have not received evidence yet of prescribing or administering anything in respect thereto.

Concerning still another chiropractor the report is that he is advertising to make adjustments covering contagious diseases, and, in a manner, he is advertising certain rights and privileges of a physician and surgeon, although he does not practice surgery nor prescribe medicine.

Concerning another chiropractor, the report is that he not only adjusts concerning venereal diseases, but he treats with medicine. Thus far, we have not secured any direct evidence of prescription or of administering medicine by this last-named chiropractor. Of course, the law is that a chiropractor cannot either prescribe or administer any medicine to cure a human ailment. We also have an opinion of the Attorney General rendered to Dr. Whittenmore on October 24, 1930, by Assistant Attorney General Shaft, which holds that neither osteopaths nor chiropractors may make use of electric rays and currents as curative agents in the treatment of disease. We are giving attention to this matter of the operations of chiropractors to the end that their activities under their licenses may be confined to their rights to make adjustment of displaced tissues of any kind or nature, in accordance with their own theories concerning chiropractics.

About the first of March we started to investigate concerning the operations of an osteopath

at Watford City, known as Dr. Leroy Parkhurst. A group of physicians and surgeons at Williston and vicinity known as The Kotana Medical Society, have given splendid co-operation in the investigations. Dr. R. H. Breslin of Williston, a member of the society, and acting as a committee for this society, has spent much time and effort in ascertaining the facts concerning the operations of this Dr. Parkhurst. The results obtained are, at the present writing, that much evidence has been secured that this osteopath, Dr. Parkhurst, has been prescribing and has been administering drugs over a considerable period of time, all in respect to his patients. The names of many patients have been secured; likewise, the prescriptions and that these were prescribed as medicine in the treatment of human ailments of Dr. Parkhurst's patients.

The matter was taken up directly with the State's Attorney of McKenzie County, Mr. J. D. Taylor. A complaint was prepared and signed by Dr. Breslin against this Dr. Parkhurst for violation of the Medical Practice Act upon ground of prescribing and administering, and upon further grounds of practicing obstetrics. Dr. Parkhurst was arrested. His case is now pending for preliminary hearing before the Justice of the Peace at Watford City. Our last information just received is that he has changed his mind about pleading guilty, that he has secured counsel, and the date of the preliminary hearing has not yet been set. If Dr. Parkhurst is bound over to District Court his trial will not come up until next October. We have advised State's Attorney Taylor that we want the complaint based solely upon the ground of prescribing and administering drugs to patients of Dr. Parkhurst. We have plenty of evidence upon that score, and we have advised further that we do not desire to have this question of obstetrics injected in this case at this time. As has heretofore been stated, the right of osteopaths to practice obstetrics is a matter requiring separate consideration and involves consideration of various provisions of our law. If we grant that osteopaths can practice obstetrics in accordance with the tenets of osteopathy, we are then faced with the question of the right of an osteopath to give prophylactic treatment under the statute, when this treatment involves prescribing and administering a drug which osteopaths, by law, are prohibited from doing. This matter of obstetrics, so far as osteopaths are concerned, we want to try out on our own battle ground and in a separate case just covering that question. We are certainly

pleased with the energy and enthusiasm that has been shown by the Kotana Medical Society of Williston in aiding the Board of Medical Examiners in upholding the law. The Board needs this sort of aid and co-operation to see that the law be observed and the public protected as the law requires in the practice of medicine.

The question has come up before the Board of the action which should be taken concerning those who come within the state as physicians and surgeons and set up offices for the practice of medicine before they have taken an examination and before they have been licensed as physicians and surgeons to practice in the state. It seems that many have assumed that such persons may practice in this state in the interim between the time of coming and the time of taking their examination, provided that they have filed with the Board an application for examination and for license. The error involved in this assumption is that the law applies equally to all, and the law prohibits practicing medicine by anyone not licensed to do so. We have been brought face to face with the complaint made by one doctor concerning a situation where another doctor sold out his practice to another who has come within the state. This newcomer has taken over the office of the North Dakota doctor, and commenced and initiated the practice of medicine, prior to the time of taking an examination before the Board and prior to the time of the issuance of any license by the Board. The doctor who sold his business to this person said that he did not think that there would be any objection to the incoming doctor practicing until he had had an opportunity of taking an examination and securing a license. His theory was that this incoming doctor was, to express his terms, "locum tenens;" that is, holding the place with an option to purchase, and he further expressed himself that it was a common thing to do this prior to the time of taking an examination and securing a license from our Board of Medical Examiners.

I am bringing this matter to your attention for the precise purpose of emphasizing the thought that those who are licensed as physicians and surgeons must first themselves understand the law, and not permit its evasion by any of their own fraternity or profession who are seeking to practice as physicians and surgeons in this state. The primary purpose of the Medical Practice Act is to protect the public, and it is the first requirement that the Board of Medical Examiners, and everyone who has been licensed by it, uphold the dignity of the law, respect it, and with it the

high ideals and ethics of their profession. It accordingly follows that it is essential that the law in every respect be observed by a regular licensed physician and surgeon, and that those licensed by the Board of Medical Examiners in this state give full support and co-operation to the Board in its efforts to see that all who are not licensed as the statute requires, be compelled to respect and abide by the law.

Since I have been working as general counsel for the Board, I have suggested from time to time, (and in this thought Dr. Williamson has fully co-operated), that the Board of Medical Examiners, in upholding and enforcing the law, should proceed carefully and cautiously in prosecutions initiated against those charged with violating the Medical Practice Act. Already, it has appeared that there is much misunderstanding concerning what constitutes the practice of medicine, pursuant to the terms of our statute. Already, it has been disclosed that there is considerable confusion as to the legal interpretation to be given to various provisions of our statutes concerning the practice of medicine by those licensed to practice the art within this state.

How far a chiropractor may go in using external appliances and remedies in making adjustments, how far an osteopath may go in practicing his profession, in accordance with the tenets of osteopathy, in applying external remedies, and even how far an optometrist may go under his license to practice optometry, are questions opening up a wide field of debate, and each are questions that need separate and careful consideration. The Board of Medical Examiners is chargeable with the upholding of the Medical Practice Act. It is its duty to prosecute when there exists facts disclosing clearly violation of law. Yet, they must be careful not to create a public attitude or public sentiment that they are attempting to persecute others who are licensed in their profession. Already the Board had adopted an attitude that it recognizes osteopaths practicing according to the tenets of osteopaths, and chiropractors practicing in accordance with their theory, but it must boldly follow those osteopaths and those chiropractors who pretend, under their license, to be what they are not, and who pretend to practice outside of the tenets of their respective professions.

Furthermore, there are many who profess an ability to alleviate human ailments by a variety of remedies which they seek to apply to human beings upon a fee paid as a reward. These are not licensed at all. They are subject to no regu-

lation by any Board except as the law applies to them. They advertise generously and they proclaim loudly. When they are cornered in that they are posing as a doctor or are prescribing or administering, they evasively seek to demonstrate that they are merely recommending, or are concerned with, a form of religious healing or of worship. Against such, it is necessary to make careful investigation to ascertain, through direct evidence, positive violation of the statute.

Then, again, we have these itinerants who come within the state for a transient visit here or there, as regular physicians and surgeons elsewhere, who minister unto the people of a given town for a time upon the theory, apparently, that they have a specialist's knowledge and a specialist's training which cannot be obtained and received here at home by our own physicians and surgeons. Apparently, the public generally do not appreciate that such come seeking directly, through their blare of trumpets, the people of our towns as patients, staying a short time, and leaving behind little responsibility, except that as stated by their own advertisements. It is apparent that it is time that some attention be given to the Medical Practice Act, to the end that this itinerant practice may be both regulated and curbed, all for the better benefit of the public in its health and in its pocketbooks.

This report, as you may note, is merely a general survey concerning the Medical Practice Act, and some initial activities that have been started during the past four months. The practice of medicine is one of the most wonderful professions in civilization as an aid to humanity's progress. It has made wonderful progress in advancement during the past 50 years. The ethics of your profession are high; your ideals are most worthy. If this report simply serves to bring to you the thought of aid and co-operation to our Board of Medical Examiners in upholding the law for the public benefit, and to aid in seeing that those who are unworthy in the practice of this noble art be prosecuted, when they seek unworthy gain and seek to sell their unworthy service, I will feel that this report has at least served some purpose.

Dr. Russell M. Wilder, Rochester, Minnesota, read a paper entitled, "Ten Years' Experience with Insulin." Discussed by Drs. W. H. Long, Fargo; C. R. Tompkins, Grafton; and Russell M. Wilder, Rochester.

Dr. Owen H. Wangenstein, Minneapolis, read a paper entitled, "The Recognition and Treatment of Pulmonary Suppuration." Dis-

cussed by Drs. W. G. Paradis, Crookston, Minnesota; Harry F. Bayard, Minneapolis; and Owen H. Wangenstein, Minneapolis.

The meeting was declared adjourned at 5:45 p.m., to reconvene at 9:00 a.m., Thursday.

### ANNUAL BANQUET

The Annual Banquet was held at the Dakotah Hotel at 6:30 p.m.

A musical program was furnished under the direction of John E. Howard, and included a group of songs by a University male quartet; marimba solos by Robert Ryan, and violin solos by Mr. Howard, accompanied at the piano by Mrs. Howard.

Dr. S. Marx White, Minneapolis, delivered an address entitled, "Pitfalls in Diagnosis."

Mr. M. M. Opegard, Editor and Manager of the Grand Forks Herald, addressed the Association on "The Press and the Physician."

President Waldren, on behalf of the Association, congratulated the Program Committee on the excellent treat they had provided, and thanked the speakers for contributing so splendidly to the entertainment.

The meeting was declared adjourned at 9:30 p.m.

### SECOND DAY

#### THURSDAY, JUNE 2—MORNING

The Association reconvened and was called to order at 9:15 a.m., by the President, Dr. Henry M. Waldren, Sr., Drayton.

Dr. H. O. Altnow, Minneapolis, read a paper entitled, "Diseases of the Blood." Discussed by Drs. J. E. Hetherington, Grand Forks; Charles B. Wright, Minneapolis; and H. O. Altnow, Minneapolis.

Dr. H. W. Cook, Minneapolis, read a paper entitled, "Some Relationships of Clinical and Insurance Medicine."

President Waldren stated that at the banquet a telegram of greeting was sent to Dr. Aylen, and read the following reply:

"Dr. H. M. Waldren, President, North Dakota Medical Association, Grand Forks.

"Telegram much appreciated. Greetings to all the boys. My forty-second year of membership. Regrets go with this.

(Signed) Jim Aylen."

Dr. Archie D. McCannell, Minot, read a paper entitled, "Advantages of Bronchoscopy and Esophagoscopy to the General Practitioner."

Dr. E. M. Ransom, Minot, read a paper en-

titled, "Eclampsia." Discussed by Dr. John H. Moore, Grand Forks.

Dr. E. P. Quain, Bismarck, read a paper entitled, "Traction and Countertraction in the Reduction of Fractures," and exhibited a patient and the apparatus employed.

The Association adjourned at 12:20 p.m. to reconvene at 2:00 p.m.

## SECOND DAY

### AFTERNOON

The Association reconvened and was called to order at 2:20 p.m. by the President, Dr. Henry W. Waldren, Sr., Drayton.

Dr. Waldren requested Dr. Grassick to introduce the President-Elect, Dr. Paul H. Burton.

DR. GRASSICK: I am sure it gives me great pleasure to introduce to you, if he needs any introduction, your future President. I am certain he is so well known and so favorably known, and that he has taken such an interesting part in the development of medicine in North Dakota, that he will make a success of his position. I am indeed glad to introduce Dr. Burton.

DR. BURTON: Fellows, I wish to thank you very much, for I deeply appreciate this honor and will do the best I can for the coming year.

Dr. Burton then took the Chair.

Dr. Charles B. Wright, Minneapolis, addressed the Association on "Veterans' Legislation." Discussed by Drs. T. J. Glasscock, Finley; Frank I. Darrow, Fargo, and C. B. Wright, Minneapolis.

Dr. A. W. Ide, St. Paul, read a paper entitled, "Internal Injuries Involving Internal Organs." Discussed by Dr. R. E. Weible, Fargo.

Dr. L. W. Larson, Bismarck, read a paper entitled, "Laboratory Procedures of Practical Value to the General Practitioner."

Dr. Harry F. Bayard, Minneapolis, read a paper entitled, "Etiology, Course and Treatment of Anal Pruritus." Discussed by Dr. R. W. Henderson, Bismarck.

Dr. W. H. Long, Fargo, read a paper entitled, "Diagnosis of Hyperthyroidism."

President Burton, on behalf of the Association, thanked the guest speakers for their courtesy in attending the meeting and addressing them, and declared the Forty-Fifth Annual Session adjourned at 5:15 p.m., *sine die*.

A. W. SKELSEY, M.D.  
Secretary.

## PROCEEDINGS OF THE COUNCIL OF THE NORTH DAKOTA STATE MEDICAL ASSOCIATION 1932

### FIRST MEETING

TUESDAY, MAY 31

The first meeting of the Council was held at the Dakotah Hotel, Grand Forks, and was called to order at 9:50 p. m. by the Chairman, Dr. N. O. Ramstad, Bismarck.

#### APPOINTMENT OF AUDITING COMMITTEE

The Chairman appointed the following to serve as an Auditing Committee to report at the next meeting of the House of Delegates:

George F. Drew, M.D., Devils Lake.

E. M. Ransom, M.D., Minot.

A. E. Spear, M.D., Dickinson.

#### OFFICIAL JOURNAL

The Chairman introduced for consideration the question of the selection of the official journal for the Association, and presented the following report:

To the Council of the North Dakota State Medical Association:

At the meeting in Aberdeen, South Dakota, last year, there was appointed by the Council a committee consisting of Drs. G. F. Drew, F. L. Wicks, and N. O. Ramstad, to investigate the relative merits of the Journal-Lancet and Minnesota Medicine as representatives of our Association.

The Committee met at Valley City and decided to ask the publishers of each journal to present their offers to us. Copies of their letters were sent to each local society in order that the entire membership of the State might obtain direct information so that they could instruct the Delegates to the State Association regarding their wishes.

These letters are attached to this report, should the Council wish to review them.

The Committee feels that with this information available, the Council should be able to decide this question promptly.

Respectfully submitted,

(Signed) N. O. RAMSTAD, M.D.,

G. F. DREW, M.D.

F. L. WICKS, M.D.

Dr. G. M. Williamson moved that the Association continue with the Journal-Lancet for the next two years, the same as in the past.

The motion was seconded by Dr. Murdock MacGregor.

DR. GEORGE F. DREW: I think a matter of two years or five years does not make much difference. There are two journals in the field

and I think most of us realize that there is not room for more than one, and that it would be better to have one good journal than two poor ones. North and South Dakota and Minnesota have about 2500 physicians and with the support of that number I think we should have a good journal for this district. Just how much of a problem it would be to make it work I do not know but I think if there was only one journal we could have good patronage and have a firstclass journal. As long as there are two in the field we cannot have a really firstclass publication.

DR. F. L. WICKS: In supporting Dr. Williamson's motion of course we are doing just as we have for several years. I look at it this way: I think it would be a good thing to make it for a year, for we stand a better chance of having it kept up if it is only for a year than if we commit ourselves for a number of years. It appealed to me that it is probably up to us to remain as at present for I think it a little bit unwise to make a change at this time.

DR. J. J. SEIBEL: Our County Society is in favor of the same arrangement we have.

DR. HENRY M. WALDREN, SR.: I am in accord with the motion, to stay with the Journal-Lancet and give them a further opportunity to serve us.

DR. A. E. SPEAR: The Southwest District sent their Councilor without instructions, but we would like to see this definitely settled if possible. We feel that under the present conditions it would not be well to withdraw our support from the Journal-Lancet, especially as they are trying to put out a better publication. We do feel that there is only room for one journal and we would like to see them consolidate, if possible. I am in favor of supporting the motion.

DR. P. G. ARZT: Our Society concluded that it would not be well to make a change at this time.

DR. LEE B. GREENE: All of the members of the Southwest District feel that we should stand by the Journal-Lancet at this time.

DR. N. O. RAMSTAD: The Sixth District Society considered this matter and felt that it would be well to go over to Minnesota Medicine, but left their Councilor uninstructed.

DR. E. M. RANSOM: Our Society went on record as in favor of the Journal-Lancet.

Dr. Williamson's motion was then put to a vote and unanimously carried.

#### APPOINTMENT OF EDITORIAL BOARD

Dr. Murdock MacGregor moved that the present board be reappointed, substituting the incoming president for Dr. Waldren.

The motion was seconded by Dr. Williamson and unanimously carried.

#### HISTORY OF MEDICINE IN NORTH DAKOTA

Dr. G. M. Williamson stated that Dr. Grassick had collected sufficient material for another volume of the History of Medicine in North Dakota, and that if he could be furnished the services of a stenographer he could prepare the material in manuscript form for future publication.

Dr. Lee B. Greene moved that the Committee on Medical History be authorized to consult with Dr. Grassick and make suitable arrangements for putting his notes in shape to be handled by any future historian, and that the necessary expense be authorized.

The motion was seconded by Dr. J. J. Seibel and unanimously carried.

#### CHANGE IN DISTRICTS

Dr. Murdock MacGregor introduced the question of consolidation of some of the districts and asked if anything ever had been done about it. He stated that several of the men from Wahpeton would like to join the First District Society and attend the meetings if it could be arranged.

The matter was discussed by Drs. Wicks, Williamson, and Spear.

Dr. Williamson suggested that it would be well to leave the matter until the arrival of Dr. W. C. Fawcett on Wednesday.

#### MEDICAL ECONOMICS

President Waldren discussed informally the question of health insurance and medical economics.

Dr. MacGregor moved to adjourn, to meet at the call of the Chairman.

The motion was seconded and unanimously carried and the Council adjourned at 10:45 p. m.

#### SECOND MEETING

THURSDAY, JUNE 2

The second meeting of the Council was called to order at 1:45 p. m. by the Chairman, Dr. N. O. Ramstad, Bismarck.

#### EXPENSE OF ANNUAL SESSIONS

Dr. G. M. Williamson introduced the question of the expense incident to the Annual Sessions.

This matter was discussed by Drs. Burton, Greene and Williamson.

Dr. Paul H. Burton moved that the present sum of \$150.00 appropriated by the Association toward the expense of the Annual Sessions be increased to \$200.00, to apply to this year's meeting.

The motion was seconded by Dr. E. M. Ransom, discussed by Dr. Williamson, and unanimously carried.

#### ELECTION OF OFFICERS

CHAIRMAN: Dr. G. M. Williamson moved that Dr. E. M. Ransom be elected as Chairman of the Council.

The motion was seconded and unanimously carried.

CLERK: Dr. Murdock MacGregor moved that Dr. G. M. Williamson be re-elected Clerk of the Council.

The motion was seconded and unanimously carried.

#### FOLLOW-UP OF TUBERCULOUS PATIENTS

Dr. Charles MacLachlan introduced the question of recommending to the Governor that he appoint a traveling unit to follow-up patients discharged from San Haven Sanitarium.

Dr. G. M. Williamson moved that this recommendation be submitted to the general assembly at the afternoon meeting.

The motion was seconded by Dr. Murdock MacGregor and carried.

As this completed the business before the Council for the Forty-fifth Annual Session, the meeting was declared adjourned at 2:10 p. m., *sine die*.

GEORGE M. WILLIAMSON, M.D.  
Clerk of the Council.

#### PRESIDENTIAL ADDRESS

H. M. WALDREN, SR., M. D.  
*Drayton, N. D.*

Mr. President-elect, fellow members of the North Dakota State Medical Association, and guests, I take this occasion to express to you my deep and heartfelt appreciation of the honor you conferred upon me when you elected me president of our state association. I accepted the office, realizing the responsibilities that went with it, and have endeavored, through the year, to render service in return for the honor you so graciously conferred upon me. If these services have met with your approbation, then I am rewarded for any

efforts put forth to hold our association to the high standards set by its illustrious founders.

Scientific medicine may well look with pride upon its achievements of the past half century. We observe the history of medical practice from the days of empiricism into the era of scientific discoveries related to the medical field. The microscope revealed, through the efforts of Neisser, the gonococcus in '79. Two years later, in '81, Laveran described the amœba of malaria. Came '82, Koch electrified the medical world with his description of the tubercle bacillus. In '84, Metchnikoff gave us the theory of phagocytosis. In '87, Weichselbaum discovered the meningococcus. One could go on *ad infinitum* but I would simply be repeating what is familiar to you all. Each year one might quote not one, but many, outstanding contributions worked out by members of our profession for the advancement of scientific medicine and the benefit of the human race. If a pageant of the years were to pass before us, each year representing an outstanding achievement, we might observe:

1876—Use of stomach tube—Ewald.

1877—Relation of the liver to metabolism.

1878—First excision of goitre—Kocher.

1879—Gonococcus discovered—Neisser.

1880—Parathyroid described—Sandstrom.

1881—Discovery of the malarial parasite—  
Laveran.

1882—Discovery of the tubercle bacillus—  
Koch.

1883—Conception of the body as a machine  
—Voit.

1884—Theory of phagocytosis—Metchnikoff.

1885—Prevention of hydrophobia—Pasteur.

1886—Relation of the pituitary to acromegaly  
—Pierre Marie.

1887—Meningococcus discovered—Weichsel-  
baum.

1888—Studies in toxins—Roux and Yersin.

1889—Proof of the relation of pancreas to  
diabetes—Von Mehring and Min-  
kowski.

1890—Diphtheria treated with antitoxin—  
Behring.

1891—Lumbar puncture introduced—Quincke.

1892—Discovery of bacillus aerogenes capsu-  
latus—Welsh.

1893—Increased metabolism in exophthalmic  
goitre—Mueller.

1894—Introduction of X-rays—Roentgen.

1895—Neurological studies—Charcot.

- 1896—Diagnosis of typhoid bacterial agglutination—Widal.
- 1897—Researches in proteins and purins—Emil Fischer.
- 1898—Differentiation of human and bovine tuberculosis—Theobald Smith.
- 1899—Chemical activation of sea urchin's egg—Loeb.
- 1900—Studies in yellow fever—Reed and Carroll.
- 1901—Parasite of sleeping sickness—Dutton and Ford.
- 1902—Isolation of adrenalin—Takamine.
- 1903—String galvanometer introduced—Einthoven.
- 1904—Respiration calorimeter introduced—Atwater.
- 1905—Discovery of spirocheta pallida—Schaudinn.
- 1906—Discovery of Wassermann reaction—Wassermann.
- 1907—Sugar from protein in diabetes—Lusk.
- 1908—Introduction of duodenal tube and bucket—Einhorn.
- 1909—Discovery of salvarsan—Ehrlich.
- 1910—Use of digitalis in fibrillation—MacKenzie.
- 1911—Beri beri vitamine isolated—Funk.
- 1912—Calculation of blood reaction from CO<sub>2</sub>—Henderson, Hasselbach, and Lunds-gaard.
- 1913—Test of immunity to diphtheria—Schick.
- 1914—Classification of arrhythmias—Wenckebach.
- 1915—Studies on spirochetosis icterohemorrhagica—Inada.
- 1916—Bronchoscopic advances—Chevalier Jackson.
- 1917—Introduction of the gas burette—Van Slyke.
- 1918—Introduction of quinidine—Frey.
- 1919—Advances in colloid chemistry—Loeb.
- 1920—CO<sub>2</sub> and intracellular reaction—Jacobs.
- 1921—Insulin—Banting and co-workers.
- 1922—Lipiodol—Sicard.
- 1923—Application of colloid chemistry to mammalian blood—Van Slyke, Wu, and McLean.
- 1924—Scarlatinal antitoxin—Dochez and the Dicks.
- 1925—Cholecystography—Graham.
- 1926—Parathyroid extract—Collip.

While we listen to this recital we perhaps do not remark the forward march of progress

a closer survey will disclose; these leaders all have to do with an understanding of the problem of care of the sick and that the final result depends on an earlier discovery. In 1905, Schaudin's discovery of the spirocheta pallida led to Wassermann's work the following year and to Ehrlich's contribution of salvarsan in 1909. Again in 1889, the proof of the relation of the pancreas to diabetes by von Mehring and Minkowski, the formation of sugar from protein described by Lusk, the importance of the ketogenic and the anti-ketonic balance in the dietetics of diabetes by Schaffer, all assisted Banting, McLeod, and their co-workers, in producing insulin.

William Osler's name is not mentioned in this list, but during these years his contributions were many, and humanity will always recognize that he delivered them from the scourge of the bacillus typhosis.

Much remains to be uncovered, but what one thing will discover this storehouse of unknown treasures? What is its "open sesame"? *Service!* There is no life which typifies a service to mankind more than that of a physician. I shall not attempt to express the idea further. Leigh Hunt expresses it in his poem "Abou Ben Adhem"; and Dr. William Royal Stokes suggests that this be adopted as the doctor's professional hymn:

#### ABOU BEN ADHEM

Abou Ben Adhem (may his tribe increase!)  
 Awoke one night from a deep dream of peace,  
 And saw within the moonlight of his room,  
 Making it rich, and like a lily in bloom  
 An angel, writing in a book of gold.  
 Exceeding peace had made Ben Adhem bold,  
 And to the presence in the room he said,  
 "What writest thou?" The vision raised its  
 head,  
 And, with a look made all of sweet accord,  
 Answered, "The names of those who love the  
 Lord!"  
 "And is mine one?" said Abou. "Nay, not so,"  
 Replied the angel. Abou spoke more low,  
 But cheerily still, and said, "I pray thee, then,  
 Write me as one who loves his fellow-men."  
 The angel wrote and vanished. The next night  
 It came again, with a great wakening light,  
 And showed the names whom love of God  
 had blest;  
 And lo! Ben Adhem's name led all the rest.

## DISTRICT AND COUNTY ROSTER

## CASS COUNTY MEDICAL SOCIETY

## PRESIDENT

Morris, A. C..... Fargo

## SECRETARY-TREASURER

Kilbourne, B. K..... Fargo

Aylen, J. P..... Fargo  
 Baillie, W. F..... Fargo  
 Bakke, H..... Lisbon  
 Boerth, E. H..... Buffalo  
 Bray, R. B..... Fargo  
 Burton, P. H..... Fargo  
 Carpenter, G. A..... Fargo  
 Clay, A. J..... Fargo  
 Darrow, Frank I..... Fargo  
 Darrow, Kent E..... Fargo  
 Dillon, J. G..... Fargo  
 Elofson, Carl E..... Fargo  
 Evans, L. J..... New York City  
 Fjelde, J. H..... Fargo  
 Floew, Arnt T..... Fargo  
 Fortin, H. J..... Fargo

Fortney, A. C..... Fargo  
 Foster, G. C..... Fargo  
 Gowenlock, H. J..... Gardner  
 Hanna, J. F..... Fargo  
 Haugen, H..... Fargo  
 Haynes, G. H..... Lisbon  
 Heimark, A. J..... Fargo  
 Hendrickson, G..... Enderlin  
 Hotchkiss, Wm..... Fargo  
 Huntley, H. B..... Leonard  
 James, J. B..... Page  
 Jelstrup, Christian..... Kindred  
 Joistad, Arthur H..... Fargo  
 Kaess, A. J..... Fargo  
 Kilbourne, B. K..... Fargo  
 Lancaster, W. E. G..... Fargo  
 Larson, C. B..... Fargo  
 Larson, G. A..... Fargo  
 Lewis, T. H..... Fargo  
 Limburg, A. M..... Fargo  
 Long, W. H..... Fargo  
 MacGregor, M..... Fargo

Miller, H. W..... Casselton  
 Morris, A. C..... Fargo  
 Nichols, A. A..... Fargo  
 Nichols, W. C..... Fargo  
 Oftedal, Axel..... Fargo  
 Oftedal, Sverre..... Fargo  
 Oftedal, Trygve..... Fargo  
 Patterson, T. C..... Lisbon  
 Pray, R. E..... Fargo  
 Richter, E. H..... Hunter  
 Rindlaub, E..... Pasadena, Calif.  
 Rostel, Hugo..... Fargo  
 Rothnem, T. P..... Fargo  
 Sand, Olaf..... Fargo  
 Skelsey, A. W..... Fargo  
 Stolinsky, A..... Sheldon  
 Swanson, J. C..... Fargo  
 Tainter, Rolfe..... Fargo  
 Tronnes, N..... Fargo  
 Watson, E. M..... Fargo  
 Weible, R. E..... Fargo

## DEVILS LAKE DISTRICT MEDICAL SOCIETY

## PRESIDENT

Laugeson, L..... Cando

## SECRETARY-TREASURER

Drew, G. F..... Devils Lake

Arneson, A. O..... McVille  
 Beek, R. H..... Lakota  
 Blair, A. K..... Minnewaukan  
 Call, A. M..... Rugby  
 Drew, G. F..... Devils Lake  
 Emert, H. F..... Sarles

Engesather, J. A. D..... Brocket  
 Fawcett, J. C..... Devils Lake  
 Fawcett, W. C..... Starkweather  
 Graham, J. D..... Devils Lake  
 Horsman, A. T..... Devils Lake  
 Laugeson, L. M..... Cando  
 Lees, H. D..... Minneapolis  
 McDonald, J. A..... Cando  
 McGurran, C. J..... Devils Lake  
 McIntosh, G. J..... Devils Lake  
 McLean, Neil..... Devils Lake

Mattson, R. H..... McVille  
 Nicholson, E. G..... Lawton  
 O'Hara, E. S..... Esmund  
 Sedlacek, B. B..... Fort Totten  
 Sihler, W. F..... Devils Lake  
 Smith, C..... Devils Lake  
 Stickelberger, J..... Oberon  
 Verret, B. D..... Rolla  
 Vigeland, J. G..... Brinsmade  
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O'Keefe, Henry..... Grand Forks  
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 Vance, R. W..... Northwood  
 Wagar, W. D..... Michigan  
 Waldren, H. M., Sr..... Drayton  
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 Williamson, G. M..... Grand Forks  
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 Grieve, H. G.....Minot  
 Halliday, D. J.....Kenmare  
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Moffat, George.....Crosby  
 Moreland, J. W.....Carpio  
 Nelson, L. F.....Bottineau  
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 Parker, R. M.....Portal  
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 Ransom, E. M.....Minot  
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 Rowe, P. H.....Minot  
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 Brandt, A. M.....Bismarck  
 Buckingham, T. W...Aberdeen  
 Bunting, F. E.....Mandan  
 Constans, G. M....Bismarck  
 Diven, W. L.....Bismarck  
 Eastman, L. G.....Hazen  
 Fisher, A. M.....Bismarck  
 Fredricks, L. H....Bismarck

Friese, P. W.....Bismarck  
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 Gordon, W. L.....Washburn  
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 Heinzroth, George..Turtle Lake  
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 Monteith, George....Hazelton  
 Nelson, J. M.....Hebron  
 Nickerson, B. S....Mandan  
 Owens, P. L.....Bismarck  
 Pierce, W. B.....Bismarck

Quain, E. P.....Bismarck  
 Quain, F. D.....Bismarck  
 Ramstad, N. O....Bismarck  
 Rasmussen, F. P....Beulah  
 Rice, P. F.....Solen  
 Roan, M. W.....Bismarck  
 Schoregge, C. W....Bismarck  
 Smith, C. C.....Mandan  
 Smith, L. G.....Mandan  
 Spielman, G. H....Mandan  
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		Lynde, Roy.....Ellendale
		Lyle, W. D.....Havana
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		Hetzler, A. E.....Richardton
		Hill, S. W.....Regent
		Law, I. M.....Halliday
		Lemieux, D.....New England
		Lyons, W. M.....Sentinel Butte
		Murray, K. M.....Scranton
		Nachtwey, A. P.....Dickinson
		Neville, J. V.....Dickinson
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		Patterson, Stanley.....Rhame
		Perkins, G. A.....Dickinson
		Radl, R. B.....Minneapolis
		Rodgers, R. W.....Dickinson
		Schumacher, N. W.....Hettinger
		Smith, Oscar M.....Killdeer
		Spear, A. E.....Dickinson
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		Voss, Carl.....Hettinger
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		Bowen, Jesse W.....Dickinson
		Bradley, W. C.....Beach
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		Ostfield, J. R.....Jamestown
		Peake, F.....Jamestown
		Sorkness, Joseph.....Jamestown
		Wink, Helena.....Jamestown
		Winn, F. C.....Jamestown
		Wood, W. W.....Jamestown
		Woodward, F. O.....Jamestown
		Arzt, P. G.....Jamestown
		Buzzell, C. P.....Cleveland
		Carpenter, G. S.....Jamestown
		Conrad, J. L.....Jamestown
		Culbert, M. H.....Courtenay
		DePuy, T. L.....Jamestown
		Gerrish, W. A.....Jamestown
		Griess, R. O.....Jamestown
		Holt, G. H.....Jamestown
		Karterman, M. R.....Lake Williams
		Lang, A. A. J.....Jamestown

## TRAILL-STEELE COUNTY MEDICAL SOCIETY

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		Gibbons, J. M.....Finley
		Hjelle, C. A.....Portland
		Kjelland, A. A.....Hatton
		Knutson, O. A.....Buxton
		Little, R. C.....Mayville
		Odegaard, Bernt.....Mayville
		Savre, M. T.....Northwood
		Vinje, Syver.....Hillsboro

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		Hammargren, A. F.....Harvey
		La Pointe, J. P.....Harvey
		MacKenzie, J. R..New Rockford
		MacLachlan, C.....San Haven
		Matthaei, D. W.....Fessenden
		Matthaei, Pearl V.....Fessenden
		Meadows, R. W.....Carrington
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 Almklov, L.....Cooperstown  
 Arneberg, J. G.....Minneapolis  
 Arneson, A. O.....McVile  
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 Arzt, Philip G.....Jamestown  
 Aylen, James Prentiss...Fargo  
 Baer, DeWitt.....Steele  
 Baillie, W. F.....Fargo  
 Bakke, H.....Lisbon  
 Banister, E. B.....Grand Forks  
 Bascom, K. F.....Minot  
 Beek, R. Hudson.....Lakota  
 Beithon, E. J.....Hankinson  
 Benson, O. T.....Glen Ullin  
 Bentzen, Olaf.....Grand Forks  
 Benwell, H. D.....Grand Forks  
 Berg, H. M.....Bismarck  
 Blair, A. K.....Minnewaukan  
 Blatherwick, W. E...Van Hook  
 Bodenstab, W. H.....Bismarck  
 Boerth, E. H.....Buffalo  
 Bowen, J. W.....Dickinson  
 Bowman, L. J.....Shelly, Minn  
 Boyum, P. A.....Harvey  
 Bradley, W. C.....Beach  
 Brandes, H. A.....Bismarck  
 Brandt, Albert M.....Bismarck  
 Bray, R. B.....Fargo  
 Breslin, R. H.....Williston  
 Brown, Fred.....Valley City  
 Buckingham, T. W.....Aberdeen  
 Bunting, Frank E.....Mandan  
 Burton, Paul H.....Fargo  
 Buzzell, C. P.....Cleveland  
 Call, A. M.....Rugby  
 Cameron, A. L.....Minot  
 Campbell, William...Valley City  
 Campbell, R. D.....Grand Forks  
 Carpenter, G. A.....Fargo  
 Carpenter, G. S.....Jamestown  
 Carr, A.....Minot  
 Carr, Andy M.....Minot  
 Carr, John D.....Jamestown  
 Chernausek, S.....Dickinson  
 Clay, A. J.....Fargo  
 Conrad, J. L.....Jamestown  
 Constans, Geo. M.....Bismarck  
 Cornelius, F. J.....Bowman  
 Countryman, J. E.....Grafton  
 Craise, O. S.....Towner  
 Craven, J. P.....Williston  
 Crawford, John...New Rockford  
 Crosby, E. B.....Valley City  
 Culbert, M. H.....Courtenay  
 Cuthbert, W. H.....Hillsboro  
 Dach, John L.....Reeder  
 Dahl, P. K.....Belfield  
 Dalager, N. O.....Anamoose  
 Darrow, Frank I.....Fargo  
 Darrow, K. E.....Fargo  
 Deason, Frank W.....Grafton  
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 De Vault, V. T.....Williston  
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 Dillon, J. G.....Fargo  
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 Dochterman, L. B.....Williston  
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 Durnin, Charles.....Westhope  
 Eastman, L. G.....Hazen  
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 Fergusson, F. W.....Kulm  
 Field, A. B.....Forest River  
 Fisher, Albert M.....Bismarck  
 Fjelde, J. H.....Fargo  
 Flaten, A. A.....Edinburg  
 Flath, A.....Stanley  
 Flath, M. G.....Stanley  
 Floew, Arnt T.....Fargo  
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 Fortney, A. C.....Fargo  
 Foster, Geo. C.....Fargo  
 Fredricks, L. H.....Bismarck  
 French, H. E.....Grand Forks  
 Friese, P. W.....Bismarck  
 Frogner, G. S.....Parshall  
 Gaebe, O. C.....New Salem  
 Garrison, M. W.....Minot  
 Gates, Russell.....Minot  
 Gerrish, W. A.....Jamestown  
 Gertson, G. D.....Grand Forks  
 Gibbons, J. M.....Finley  
 Gilsdorf, Walter H....Dickinson  
 Gislason, G. J.....Grand Forks  
 Glaspel, C. J.....Grafton  
 Glaspel, G. W.....Grafton  
 Goodman, R.....Powers Lake  
 Gordon, W. L.....Washburn  
 Gowenlock, H. J.....Gardner  
 Graham, J. D.....Devils Lake  
 Grangaard, Henry O....Ryder  
 Grant, George.....Wishek  
 \*Grassick, James...Grand Forks  
 Greene, E. E.....Westhope  
 Greene, Lee B.....Edgeley  
 Greenman, N. H....Fairmount  
 Griebenow, F.....Bismarck  
 Griess, R. O.....Jamestown  
 Grieve, H. G.....Minot  
 Gunper, J. B.....Belfield  
 Gundermann, H. R....Monango  
 Haagenson, E. C...Grand Forks  
 Halliday, D. J.....Kenmare  
 Halverson, Henry L....Minot  
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 Hamilton, J. S.....Bathgate  
 Hammargren, A. F....Harvey  
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 Haraldson, O.....Minot  
 Hardy, N. A.....Minto  
 Haugen, H.....Fargo  
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 Haynes, G. H.....Lisbon  
 Healy, H. H.....Grand Forks  
 Heimark, A. J.....Fargo  
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 Hetherington, J. E..Grand Forks  
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 Hillis, S. J.....Berthold  
 Hjelle, Carl A.....Portland  
 Hofto, J. M.....Grand Forks  
 Hogue, R. R.....Linton  
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 Hood, C. E.....Lansford  
 Horsman, A. T.....Devils Lake  
 Hoskins, J. H.....Wahpeton  
 Hotchkiss, W. M.....Fargo  
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 Hurd, F. D.....Tolley  
 Irvine, Vincent S...Park River  
 Ivers, M. U.....Christine  
 Jacobs, George C....Wahpeton  
 James, J. B.....Page  
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 Jensen, August F.....Rugby  
 Johns, Stephen M.....Velva  
 Johnson, J. A.....Bottineau  
 Johnson, P. O. C...Watford City  
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 Jones, Carlos S.....Williston  
 Kaess, A. J.....Fargo  
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 Kermott, Louis H.....Minot  
 Kilbourne, B. K.....Fargo  
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 Kjelland, A. A.....Hutton  
 Knapp, Henry G.....Minot  
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 Kolb, F. K.....Granville  
 La Pointe, J. P.....Harvey  
 LaRose, Victor J.....Bismarck  
 LeBien, E. A.....McHenry  
 Lancaster, W. E. G....Fargo  
 Landry, L. H.....Walhalla  
 Lang, A. A. J.....Jamestown  
 Larson, C. B.....Fargo  
 Larson, E. J.....Underwood  
 Larson, G. A.....Fargo  
 Larson, L. W.....Bismarck  
 Laugeson, L. M.....Cando  
 Law, H. W. F....Grand Forks  
 Law, I. M.....Halliday  
 Leavitt, R. H.....Carson  
 Leedahl, O. S.....Stanley  
 Lees, H. D.....Minneapolis  
 Leigh, R. E.....Grand Forks  
 Lemieux, D.....New England  
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 Liebeler, W. A....Grand Forks  
 Limburg, A. M.....Fargo  
 Lipp, G. R.....Bismarck  
 Little, R. C.....Mayville  
 Lohrbauer, L. T....Grand Forks  
 Longstreth, W. E.....Kensal  
 Long, W. H.....Fargo  
 Lyle, W. D.....Havana  
 Lyman, F. V.....Velva  
 Lynde, Roy.....Ellendale  
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 McDonald, J. A.....Cando  
 McGurren, C. J....Devils Lake  
 McIntosh, G. J....Devils Lake  
 McLean, Neil.....Devils Lake  
 McQueen, W. W.....Langdon  
 Macdonald, A. C....Valley City  
 Macdonald, A. W....Valley City

Mahon, Ruth M. . . . . Grand Forks  
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 Matthaei, Pearl V. . . . . Fessenden  
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 Miller, J. P. . . . . Grand Forks  
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 Peake, M. F. . . . . Grand Forks  
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 Pence, R. W. . . . . Minot  
 Perkins, G. A. . . . . Dickinson  
 Pierce, A. E. . . . . Minot

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 Platou, C. A. . . . . Valley City  
 Porter, W. H. . . . . Calvin  
 Pray, E. A. . . . . Valley City  
 Pray, R. E. . . . . Fargo  
 Quain, E. P. . . . . Bismarck  
 Quain, F. D. . . . . Bismarck  
 Quale, V. S. . . . . Grand Forks  
 Radl, R. B. . . . . Minneapolis  
 Ramstad, N. O. . . . . Bismarck  
 Ransom, E. M. . . . . Minot  
 Rasmussen, F. P. . . . . Beulah  
 Ray, R. H. . . . . Garrison  
 Ribble, George. . . . . LaMoure  
 Rice, C. P. . . . . Wahpeton  
 Rice, P. F. . . . . Solon  
 Richter, E. H. . . . . Hunter  
 Rindlaub, E. . . . . Pasadena, Calif.  
 Roan, M. W. . . . . Bismarck  
 Rodgers, R. W. . . . . Dickinson  
 Rolleison, C. J. . . . . Crosby  
 Rollie, C. O. . . . . Drake  
 Rostel, Hugo. . . . . Fargo  
 Rothnem, T. P. . . . . Fargo  
 Rowe, P. H. . . . . Minot  
 Ruud, H. O. . . . . Grand Forks  
 Ruud, M. B. . . . . Grand Forks  
 Ryan, D. E. . . . . Hankinson  
 Rystad, O. H. . . . . Grand Forks  
 Sand, Olaf. . . . . Fargo  
 Sasse, E. G. . . . . Lidgerwood  
 Savre, M. T. . . . . Northwood  
 Schoregge, C. W. . . . . Bismarck  
 Schumacher, N. W. . . . . Hettinger  
 Sedlacek, B. B. . . . . Fort Totten  
 Seibel, J. J. . . . . Harvey  
 Sihler, W. F. . . . . Devils Lake  
 Skelsey, A. W. . . . . Fargo  
 Skovholt, H. T. . . . . Williston  
 Smith, C. C. . . . . Mandan  
 Smith, C. . . . . Devils Lake  
 Smith, J. A. . . . . Noonan  
 Smith, LeRoy G. . . . . Mandan  
 Smith, O. M. . . . . Killdeer  
 Sorenson, A. R. . . . . Minot  
 Sorkness, Joseph. . . . . Jamestown  
 Spear, A. E. . . . . Dickinson  
 Spielman, G. H. . . . . Mandan  
 Stackhouse, C. E. . . . . Bismarck  
 Steeves, E. O. . . . . Rugby  
 Stickelberger, J. S. . . . . Oberon  
 Stolinsky, A. . . . . Sheldon

Strauss, F. B. . . . . Bismarck  
 Stromberg, G. E. . . . . Langdon  
 Swanson, J. C. . . . . Fargo  
 Tainter, Rolfe. . . . . Fargo  
 Thelen, W. P. . . . . Wilton  
 Thompson, A. Y. . . . . Larimore  
 Thompson, A. M. . . . . Wahpeton  
 Thompson, R. C. . . . . Wilton  
 Thorgrimsen, G. G. . . . . Grand Forks  
 Timm, J. F. . . . . Makoti  
 Tompkins, C. R. . . . . Grafton  
 Tronnes, Nels. . . . . Fargo  
 Vance, R. W. . . . . Northwood  
 Van de Erve, S. H. . . . . Carrington  
 VanHouten, J. . . . . Valley City  
 VanHouten, R. . . . . Oakes  
 Veigel, Lester. . . . . New England  
 Verrett, D. D. . . . . Rolla  
 Vigeland, J. G. . . . . Brinsmade  
 Vinje, Syver. . . . . Hillsboro  
 Vonnegut, F. F. . . . . Hague  
 Voss, Carl. . . . . Hettinger  
 Wagar, W. D. . . . . Michigan  
 Waldren, H. M., Sr. . . . . Drayton  
 Waldren, H. M., Jr. . . . . Drayton  
 Waldschmidt, R. H. . . . . Bismarck  
 Wanner, W. B. . . . . Wimbledon  
 Watson, E. M. . . . . Fargo  
 Weed, F. E. . . . . Park River  
 Weeks, S. A. . . . . Grenora  
 Weible, R. E. . . . . Fargo  
 Welker, A. J. . . . . Max  
 Wendell, W. G. . . . . Marmarth  
 Westley, M. D. . . . . Cooperstown  
 Westervelt, A. E. . . . . Bowden  
 Weyrens, P. J. . . . . Hebron  
 Wheelon, F. E. . . . . Minot  
 Whitemore, A. A. . . . . Bismarck  
 Wicks, F. L. . . . . Valley City  
 Widmeyer, J. P. . . . . Rolla  
 Williamson, G. M. . . . . Grand Forks  
 Wink, Helena K. . . . . Jamestown  
 Winn, F. C. . . . . Jamestown  
 Witherstine, W. H. . . . . Grand Forks  
 Wolverton, W. C. . . . . Linton  
 Wood, W. W. . . . . Jamestown  
 Woodward, F. O. . . . . Jamestown  
 Woutat, H. G. . . . . Grant Forks  
 Wright, W. A. . . . . Williston  
 Wylie, A. R. T. . . . . Grafton  
 Yeomans, T. N. . . . . Minot  
 Zimmerman, S. A. . . . . Valley City

\*Honorary

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THE OFFICIAL JOURNAL OF THE

North Dakota State Medical Association	The Minnesota Academy of Medicine
South Dakota State Medical Association	The Soo Railway Surgical Association
The Hennepin County Medical Society	The Sioux Valley Medical Association
North Dakota State Health Officers' Association	
Great Northern Railway Surgeons' Association	
Minneapolis Clinical Club	

W. A. JONES, M.D.  
 1859-1931

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### IMPRESSIVE THOROUGHNESS

We admire the man who, through experience and intuition, prescribes intelligently in many cases without a thorough physical examination. We would have a greater admiration for this same man, however, if he did in every case make a thorough examination, and, what is more to the point, *so would the patient.*

When a patient presents himself, it is usually with a preconceived expectation that the body must be exposed to view for proper investigation. In most cases it is not only necessary but also, as has been said before, it is commendable psychology and legitimate art to demonstrate to the patient in every possible way that an interest is taken in his case. The chest and abdomen must always be bared for proper examination of the vital organs.

Bretheran, let us not forget the diagnostic and therapeutic value of "the laying on of hands."

A. E. H.

### A BEACON-LIGHT

The accreditation of North Dakota by the Bureau of Animal Industry of the United States Department of Agriculture, in co-operation with the North Dakota Live Stock Sanitary Board, is a most important step in the control of human disease of that state. Six other states have previously been accredited: Wisconsin, Maine, North Carolina, Ohio, Indiana and Michigan. The standard for the accrediting is the reduction of the percentage of positive tuberculin reactors among cattle to five-tenths of one per cent or less.

When the veterinarians began their work they met with much opposition and discouragement, yet they had a vision of tuberculosis control, and continued to work. In the brief period of approximately fifteen years they have reduced the incidence of positive tuberculin reactors so that throughout the entire nation forty-three per cent of all counties are accredited. In some counties, particularly in Wisconsin, tuberculosis has been completely eradicated from the animal herds. This is the goal of the Live Stock Sanitary Board for all counties and states of the nation.

The public health aspects of this program are obvious to all members of the medical profession. The decrease in bone and joint and lymphatic tuberculosis which has resulted from this procedure, together with pasteurization ordinances in cities, is an old story today.

At one time, statements were made such as the following, which is taken from the Reference Handbook of the Medical Sciences, Volume VII, Page 891: "No effective control of bovine tuberculosis is possible. To use the tuberculin test for its detection and to destroy all cattle which give the reaction would result in economic losses impossible for the state to meet." Does not this statement recall to mind similar statements, that have been made and are being made at present, in regard to the control of tuberculosis in the human family? Do the above facts mean that the veterinarians are accomplishing the impossible?

The success of the veterinarians is a direct challenge to the medical profession to duplicate their work in the field of human tuberculosis. They have demonstrated that such a program is not only possible but is the wisest public health measure. In fact, tuberculin testing and segregation is the only measure that will ever control tuberculosis, short of a specific agent.

The first reaction to this challenge is, of course, that the veterinarians could slaughter their infected animals while such a procedure is not pos-

sible in human tuberculosis. But, and the *but* is a large one, human beings can be taught the necessary precautions following their diagnosis, a situation which is not within the veterinarians' scope.

The same singleness of purpose and the same measures as have been employed by the veterinarians, with such modifications as the situation demands, will yield the same gratifying results in the control of human tuberculosis. The way has been pointed out. Let us, as doctors of human medicine, awake!

J. A. M.

#### POLITICAL RESPONSIBILITY

Why a physician takes so little active interest in politics, it is difficult to understand. Perhaps, by reasons of long trained instinct, he feels that it savors of unethical publicity; and it has become second nature for him to shun headlines and footlights. Then let it be understood that these, in and of themselves, may or may not be such agents.

Was it unethical for Doctor Benjamin Rush to have his name emblazoned for all times as a signer of the Declaration of Independence? When Doctor John Warren stepped out from teaching anatomy at Harvard to march at the head of his troops up Bunker Hill, was he thinking of posterity's acclaim or duty to his country?

We, too, have duties to perform. Our country's welfare demands that we share with every other citizen the responsibility of government. Let us keep posted on the issues of the day, attend public meetings, and actually organize in the interest of a cause in which we believe. Let us not forget, by the way, that we are expected intelligently to direct legislation *in matters and measures for which we are specially trained*. If we acquaint ourselves with prospective candidates' viewpoints on medical matters, which we understand, this will serve as a safe criterion by which to judge their sanity on other questions.

A. E. H.

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#### CLINTON E. SPICER

Again time calls the roll and the passing of another of our number is noted. Word has reached us from Long Beach, California, that Dr. C. E. Spicer died at his home in that city July 3rd, 1932, aged 62. He received his education in the schools of his native state, Wisconsin, graduated in medicine from Rush Medical College, Chicago, in the spring of 1903, and was admitted to practice in North Dakota July 19th

of the same year. For ten years he devoted himself to general medicine in the central part of the state, laying the foundation for a successful restricted practice in later years. In the years 1913 and 1914, he took up intensive studies of eye, ear, nose, and throat at London and Vienna. Returning to North Dakota he located in Valley City and there practiced his specialty until 1930 when he removed to the West Coast. Dr. Spicer was honored by his fellows by being elected as President of the Shewenne Valley Medical Society and as President of the North Dakota Medical Association, presiding at the latter during the 1912 session at Valley City. He also served on the Board of Education of his home city and was assistant surgeon of the Northern Pacific Railway. He was active in fraternal circles and closely identified with church work.

Dr. Spicer was of the progressive type. Not content with what he received with his diploma, he continued his studies by a well directed course of reading and by frequent visits to the clinics of such centers of medical thought as Philadelphia and New York. This fitted him for giving a quality of service to his patrons that was fully abreast of the times and made a good foundation for the specialty to which he confined his work in his latter years. He is survived by his widow, two sons and a daughter, to whom he bequeaths the memory of a life of fine endeavor.

J. G.

#### DR. ROBERT EMMETT FARR

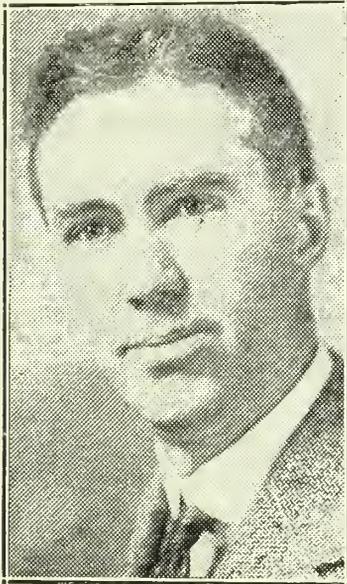
1875 - 1932

In the passing of Dr. R. E. Farr, Minneapolis and Minnesota lose one of their foremost figures in the development of surgery and especially local anesthesia. Dr. Farr was born at Montello, Wisconsin, in 1875, his parents being of Irish descent. He received his early education in the schools of Wisconsin and graduated from Rush Medical College of Chicago in 1900. He served as interne in St. Mary's Hospital at Minneapolis where he became acquainted with Dr. James Dunn, at that time an outstanding surgeon in Minneapolis. Dr. Farr subsequently became an assistant and partner of Dr. Dunn up to the time of Dr. Dunn's death.

Dr. Farr was married to Miss Mary Scallen, to whom one son, Paul, was born. Dr. Farr was thoroughly devoted to his family but suffered the great sorrow of losing both his wife and only son before his death. Dr. Farr's death

terminates entirely that branch of the Farr family.

During his life, Dr. Farr devoted all of his time to the advancement of surgery and local anesthesia. Early he became interested in the development of the latter and pioneered in its advances. He was constantly performing operations under local anesthesia that were not done elsewhere in the hope of developing the method and extending the realm of its possibilities. Many hours were spent in the anatomy rooms and the experimental department of the University in anesthesia research. Much research was carried on with his own private facilities and at private expense. So well known did Dr. Farr



Dr. Robert Emmett Farr

become in the development of his art that he had almost daily visitors from all parts of the United States and from many foreign countries. Doctors from England, Canada, France, Australia and Germany frequently came to his clinic and spent many hours learning his technic and watching his operations. Dr. Farr spent a great deal of time and a large amount of money in the development of special retractors, special instruments for bone surgery, special operating room lights, but most of all in the development of a local anesthesia injector. This injector he manufactured and marketed personally because of his desire to supervise its manufacture rather than permit it to be commercialized. Many reels of motion pictures were taken at personal expense for educational purposes. These reels have been

exhibited before some of the largest societies of the United States, both East and West. It was Dr. Farr's desire that these films be left to the profession, and available for educational purposes.

Dr. Farr continually contributed to medical literature; he wrote many articles on the repair of the cleft palate, abdominal surgery, but most of his articles were written upon the use of local anesthesia and the improved surgical technic which he recommended to render this anesthesia more practicable. Dr. Farr's text book on practical local anesthesia has been acknowledged throughout the world as one of the best. For his pioneer work on local anesthesia, Dr. Farr's name was recommended for the Nobel prize, one of the outstanding awards for advancement in science. Although he never received this recognition, the recommendation came from several prominent societies throughout the United States.

Dr. Farr was a man of personality, ambitious, energetic beyond measure, and always generous. He took a very active part in the development of the Minnesota State Medical Journal and served for a number of years on its editing and publishing committee. He enjoyed an argument and when he thought he was right, he was firm in his stand, and many times has he been heard to commend others for a similar stand and the courage of their convictions, even though they took issue with his ideas. Only those who knew him best are familiar with the fact that he helped to put a number of students through medical school, that he loaned numerous recent graduates sufficient money to get started and that he frequently paid the rent, and helped other physicians when they were sorely pressed. This generosity was never known to the profession.

In his college years, Dr. Farr was a great athlete, a captain of the Rush Medical football team and football coach for McCallister College. A strong, robust young man, later, however, he became the subject of great pain and practically all of his research and greatest efforts were performed under this severe handicap. During the last four years of his life, he was virtually confined to his home by great suffering during which time, however, he completed the publication of the second edition of his book and wrote the treatise on local anesthesia for a great system of surgery. Only one with his perseverance and indomitable courage would have continued to produce under such a handicap.

Dr. Farr was a past president of the Hennepin County Medical Society, a member of the

Minnesota State Medical Association, American Medical Association, Minnesota Academy of Medicine, Western Surgical Association, American Association of Obstetricians, Gynecologists and Abdominal Surgeons, and a Fellow of the American College of Surgeons.

Dr. Farr's death occurred on June 30, 1932, at St. Mary's Hospital. Funeral services were held on July 2 from the Basilica of St. Mary's, well attended by a host of his medical friends and colleagues.

S. R. M.

### NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Dr. and Mrs. M. B. Hebeisen, Chaska, Minn., are on a two months' vacation visiting leading European cities and countries.

Dr. O. W. Schlopp, Hutchinson, Minn., has been elected president of the McLeod County Medical Society for the coming year.

Dr. J. L. Montgomery, who was in active practice in Minneapolis for nearly twenty years, died at Rochester this month at the age of 50 years.

Dr. F. W. Rankin, Rochester, Minn., presented two papers at the annual meeting of the Northwest Medical Society, recently held at Spokane, Wash.

Dr. Edmund C. Emerson, St. Paul, has recently returned from Europe, where he spent several months doing graduate work in leading surgical clinics.

The mid-year convention of the South Dakota academy of Ophthalmology and Otolaryngology will be held in Mitchell in December, date to be announced later.

Dr. Robert Emmett Farr, Minneapolis, a pioneer in the development of local anaesthesia, died Thursday at St. Mary's hospital, following an illness of four years.

The McLeod County, Minn., Public Health Association held their annual meeting last month at Glencoe, with Dr. Wm. A. O'Brien, Minneapolis, as guest speaker.

Some \$10,000 is being expended in improv-

ing St. Raphael Hospital at Hastings, Minn. New plumbing, with more modern machinery and an oil burner, will be installed.

Dr. Ernest J. Larson, Underwood, N. D., who has been taking a year's work at the Graduate School of Medicine, University of Pennsylvania, is now at St. Thomas Hospital, Nashville, Tenn.

Dr. James Hynes, Minneapolis, a physician and surgeon who had practiced his profession in this city for many years, was found dead at his offices on July 8th. Dr. Hynes was 65 years of age.

Dr. C. A. Feige of Canova, S. D., was appointed a member of the state board of health by governor Green. Dr. Feige will finish the unexpired term of the late Dr. A. C. Clark of Woonsocket.

Dr. C. E. Spicer, who for many years was a practicing physician at Valley City, N. D., died this month at Long Beach, Calif. Dr. Spicer was a past president of the North Dakota State Medical Society.

The Blue Earth County, Minn., Medical Society, held their June meeting at the Mankato Golf Club on June 24th. Dr. W. C. Alvarez, Rochester, was the principal speaker, his subject being "Medical Folklore a Physician Should Know."

Dr. C. A. McKinlay, Minneapolis, has recently returned from Oklahoma City, where he was a member of the Extension Course Faculty of the University of Oklahoma on June 13, 14, and 15. His lectures were on "Subacute Bacterial Endocarditis" and "Coronary Thrombosis."

The sixty-fourth annual meeting of the Wabasha County Medical Society was held at Lake City, Minn., on July 7th, with Dr. and Mrs. J. A. Slocumb entertaining the members at dinner. Dr. W. F. Wilson, Lake City, is president and Dr. R. H. Frost, Wabasha, secretary.

The Northern Minnesota Medical Association will hold their annual meeting at Crookston, September 19th and 20th. A fine program is being arranged by a special committee and will be mailed by the secretary, Dr. O. O. Larsen, Detroit Lakes, who will be pleased to extend any information desired.

Dr. H. D. Lees, who for twelve years practiced medicine in Esmond, N. D., and was later a member of the Faculty of the University of Minnesota School of Medicine, has just returned from Philadelphia, where he is Director of the Students'

Health Service of the University of Pennsylvania, to carry on research work at the University of Minnesota during the summer months.

Dr. Arthur L. Collins of Duluth was elected president of the Great Northern Surgeons association at the final session of the annual meeting held at Duluth last month. The physicians will meet in Portland, Ore., next June. Dr. F. A. Kiehle, Portland, Ore., Dr. A. E. Gerhardt, Wenatchee, Wash., and Dr. W. Q. Conway, were elected vice presidents, and Dr. R. C. Webb, Minneapolis, secretary.

Dr. Lottie G. Bigler, Yankton, S. D., has been appointed an assistant in the medical survey to be made in South Dakota reservations. The work is under the direction of Dr. A. E. Bostrom, De Smet, of the state health department. The working staff of the survey will be composed of several doctors and dentists and some nurses. Clinics will be established on the various reservations.

Herman G. James, president of the University of South Dakota, was one of the speakers at the annual banquet of the South Dakota Medical association. In his address, President James called attention to the present state of democracy and pointed out that doctors, through their personal relationships with so many persons, could do much in developing a more intelligent public, which is essential to the success of democracy.

A physicians' short course on tuberculosis was held at Battle Lake, Minn., July 13th, with the following program being presented: Dr. J. A. Myers, associate professor of Medicine, University of Minnesota, "The Early Diagnosis and Treatment of Tuberculosis;" Dr. Leo G. Rigler, professor of roentgenology, University of Minnesota, "X-Ray Chest Diagnosis;" and Dr. M. S. Henderson of Rochester, on "Tuberculosis of the Bones and Joints."

Dr. Halbert L. Dunn, head of the section on statistics in the Mayo Clinic and Mayo Foundation, was appointed director of the University hospital and professor of medical statistics at the University of Minnesota. Dr. Dunn entered the Mayo Foundation as a fellow in medicine July 1, 1924. The following year he was associated professor of biometry and vital statistics, school of hygiene, Johns Hopkins university, Baltimore, and returned to Rochester in June, 1929, as associated professor of biometry and statistical medicine.

The sixty-fourth annual meeting of the Wa-

basha County Medical Society was held at Plain view, Minn., with the following program being presented: President's Address—"Some Changes in Thirty-eight years," W. F. Wilson, M. D., Lake City. "New Developments in the Diagnosis and Treatment of Gastric Cancer and Ulcer" (Illustrated by lantern slides), G. B. Eusterman, M. D., Mayo Clinic, Rochester. "Osteomyelitis of Humerus Treated with Maggots," R. C. Rada-baugh, M. D., Hastings. "Peroral Endoscopy," D. G. Gardiner, M. D., St. Paul. "Simplified Infant Feeding," Thomas Myers, M. D., St. Paul.

Eighteen candidates have been licensed to practice medicine in North Dakota, as authorized by Dr. G. M. Williamson, secretary of the Medical Board. Fifteen took the written, oral, and practical examination. Two were admitted via reciprocity; took oral and practical. One Diplomate of the National Board of Medical Examiners. Abner Veitch, Jr., Williston; Adolph W. Brazda, Mandan; Leonard B. Moyer, Elgin; George L. Countryman, Grafton; George U. Ivers, Christine; Robert Hallenberg, Fargo; Carrol M. Lund, Fargo; Ludwig J. Seibel, Harvey; William J. Rogne, McClusky; Arthur B. Halliday, Lidgerwood; Glen William Toomey, Devils Lake; Garnot Howe Sherman, Oakes; Gerald Arthur Knutson, Buxton; Robert Casselman Ray, Forman; Reinhold O. Goehl, Grand Forks; Daniel Tuttle Weston, Mandan; Paul Jean Breslich, Minot; Philip Henry Woutat, Grand Forks.

Dr. J. R. Westaby, Madison, was elected president of the South Dakota State Medical association, and Huron was chosen as the 1933 meeting place at the closing session of the three-day convention of the association held at Watertown June 20-22nd. Dr. E. W. Jones, Mitchell, was named president-elect, and will succeed to presidency next year, while Dr. W. G. Magee of Watertown was named vice president and under the association's rule of succession will become president in 1934. Dr. J. F. D. Cook of Langford was re-elected secretary-treasurer. Four new members of the association council were elected as follows: First District—Dr. E. A. Pit-tenger, Aberdeen. Second District—Dr. M. J. Hammond, Watertown. Fourth district—Dr. B. M. Hart, Onida. Eighth district—Dr. S. M. Hohf, Yankton. Ninth district—Dr. J. L. Stewart, Nemo. Members of the council who hold over are: Third district—Dr. C. E. Sherwood, Madison. Fifth district—Dr. E. B. Taylor, Huron. Sixth district—Dr. Fred Treon, Chamberlain.

Seventh district—Dr. A. S. Rider, Flandreau.  
Tenth district—Dr. H. R. Kenaston, Bonesteel.  
Eleventh district—Dr. A. E. Bostrom, De Smet.  
Twelfth district—Dr. Charles Flett, Milbank.  
Councilor-at-large—Dr. Percy D. Peabody, Webster.

## SOCIETIES

### Eleventh Annual Session

American Congress of Physical Therapy  
September 6, 7, 8, 9, 1932  
New York City

Announcement is made of the Eleventh Annual Scientific Session of the American Congress of Physical Therapy, which, this year, will be held in New York City. The Hotel New Yorker, with its excellent convention facilities, will be the official headquarters. The convention will be conducted over the week from September 5th to the 10th, but, officially, the scientific sessions will be run on September 6, 7, 8, and 9. On September 10, clinics will be given at more than fifteen New York hospitals.

The preliminary program which has been arranged definitely marks the 1932 session of the Congress as the year's outstanding event in physical therapy. The leading teachers, clinicians and research workers in the field have accepted invitations, and will contribute valuable scientific information to this year's Congress.

Added features in connection with this year's program are the new sections on stomatology and colon's therapy. The demand for authentic instruction in these respective specialties has prompted the program committee to ask for scientific contributions from prominent clinicians. The response has been unusual, permitting the organization of a full day's program in each section.

The sections on Medicine, Surgery, and Eye, Ear, Nose and Throat will, as heretofore, include their various group and allied specialties. Cancer, tuberculosis, and arthritis are favorite subjects which will be discussed in interesting symposia. The subject of electro-surgery of tonsils will be adequately dealt with by prominent laryngologists in the eye, ear, nose and throat section.

The outstanding achievement in physical therapeutics, the production of artificial fever by diathermy and its use in various chronic diseases, will occupy a special place on the program. Representative workers are prepared to present available data of their accomplishments with this newer therapeutic agent.

The Congress meets in the east for the first time in its eleven years of existence. This is the result of numerous invitations which have come from eastern leaders engaged in the physical therapy science. From present indications this convention should attract the largest attendance in the history of the Congress. Preliminary programs may be secured by addressing the American Congress of Physical Therapy, 30 North Michigan Avenue, Chicago.

## BOOK NOTICE

MEDICAL CLINICS OF NORTH AMERICA. Philadelphia, W. B. Saunders Co., 1931. September, 1931, Vol. 15, No. 2.

This is the Philadelphia contribution and contains, as usual, some very interesting and readable papers. A considerable portion of the field of medicine is covered.

Any discussion of the papers is quite out of place as they all seem to bring out an idea or two of the authors'. The volume seems to be especially interesting and is highly recommended to anyone in the medical field.

A. E. CARDLE, M.D.

THE PRACTICAL MEDICINE SERIES, GENERAL MEDICINE. Edited by G. H. Weaver, Lawrason Brown, G. R. Minot, W. B. Castle, W. D. Stroud, R. C. Brown, Series 1931. Chicago Year Book publishers, 1931. Price: \$3.00.

The 1931 issue of "General Medicine" published by the Year Book publishers is an excellent survey of the literature in internal medicine for the year.

The book is divided into five parts: Infectious Diseases, Diseases of the Chest, Diseases of the Blood and Blood-making Organs, Diseases of the Heart and Blood Vessels and Diseases of the Gastro-Intestinal Tract. The selection of articles is quite inclusive for each phase of the subject.

Altogether this book gives one a ready reference to the most recent work in this field.

M. J. SHAPIRO, M.D.

LEGAL MEDICINE AND TOXICOLOGY. By Ralph W. Webster, M.D., Ph.D., Clinical Professor of Medicine (Medical Jurisprudence) in Rush Medical College, University of Chicago; Professorial Lecturer in Medical Jurisprudence and Toxicology in the University of Chicago; Toxicologist to the Coroner's Office, Cook County, Illinois; Attending Chemist, Presbyterian Hospital, Chicago; Director of Chicago Laboratory, Clinical and Analytical. Cloth. Price, \$8.50, Pp. 862. Philadelphia and London: W. B. Saunders Company, 1930.

The object of this work is to present in one volume the more usual phases of Legal Medicine in a somewhat concise manner. The subject matter embraces legal procedure, rights and obligations of physicians, malpractice, death in its medicolegal circumstances, examination of blood stains, questions concerning sex and childbirth, mental disorders and toxicology. Three hundred seventeen pages are devoted to legal medicine and 513 to toxicology. It is the author's aim "to go much more thoroughly into the methods of isolation and identification of the various poisons discussed than is the case in other single volume works on the subject."

The complex relations of mental disorder and legal concepts are discussed. Perusal of this chapter in

particular brings one to reflect how far apart law and medical science continue on some important questions.

The Index comprises 31 pages. Webster's book is practical. It adds to the value of the doctor's bookshelf.

J. C. MICHAEL, M.D.

THE CONTROL OF TUBERCULOSIS IN THE UNITED STATES, by Philip P. Jacobs, Ph.D., National Tuberculosis Association, 450 7th Ave., New York, N. Y., 1932.

Jacobs' new book is about much water that has gone over the dam during the past twenty-five years. It is a guide for the new procedure in our present-day administration problem. Such a book written by a man with a great wealth of tuberculosis experience back of him adds a valuable and most useful volume to our literature.

Jacobs has given us in a few pages the problem of tuberculosis administration in retrospect and in prophesy as well as a guide to current achievement.

The book is divided into four parts, each one of which is sub-divided into chapters giving in detail information concerning:

Some Historical Aspects of the Anti-Tuberculosis Movement, Methods and Programs in the Control of Tuberculosis in the United States, Fundamental Policies of the Tuberculosis movement in the United States, and Illustrative Programs.

The chapters are completed by a very useful bibliography. The language is clear and simple, the logic evident, and the conclusions acceptable. It is a good book to own and to know.

More than twenty years have passed since the author's intimate association with the problem he discusses began. He has held his knowledge close, observed and studied the problem carefully since then. If left unwritten, this would be, as Coleridge says, like the stern lights of a ship which illumine only the track it has passed. We think the author has performed for us a service in making his experience a permanent one; that this ship in passing by has thrown from its stern a shaft of light that is informing, pleasing, and of lasting value.

H. A. BURNS, M.D.

A SPEECH FOR EVERY OCCASION, by A. C. Edgerton, L.L.M.; published by Noble and Noble, 76 5th Ave., New York City; \$2.

Here is a useful book for any man important enough to expect to be called on for a speech at a public gathering. Here is an amusing book for the man or woman with enough imagination to conceive the embarrassment of the unpracticed speaker who has been

called upon to say a few words without having had the previous benefit of this book.

The book itself is exactly what the title implies, a compendium, 450 pages in length, of speeches for every occasion. Some of the occasions are hardly likely to arise in the life of the average man, for example, an occasion demanding a speech in connection with the presentation of prizes for target shooting; but on the other hand, some of the speeches are particularly useful for physicians, particularly an "Address to a Graduating Class of Nurses." This speech contains the excellent line: "Hospitals are Cupid's favorite hunting ground."

Besides a very helpful introduction, offering a general word of advice to speakers and candidates for the office of toastmaster, the book carefully classifies and gives pertinent examples of proper speeches for the following occasions: holidays, patriotic occasions, military affairs, political gatherings, civic associations, business organizations, professional gatherings, educational and religious gatherings, social affairs, fraternal societies, christenings, condolences, and sporting events. A bright section of original toasts concludes the volume. Sprightliest among these is the toast to the woman driver: "Here's to the Woman Driver. Like Charity, her left hand never knows what her right hand does."

Most of the after-dinner jokes offered in this group of "set speeches" fall in the whiskered category, but they will probably bring the desired roar of recognition from a delighted audience when they are sprung once again. However, many are new and different and they are all classified by occasion so that a man required to make a Lincoln's Birthday speech will not be required, if he owns this book, to tell a joke more fitting for a Christmas celebration. Particularly commendable is the darkey's definition of telegraphy and radio: "First off, Rastus," the darkey explains to his friend, "ah'll expatiate on de way de telegraph works. Hit's like dis: Ef dar were a dog big 'nuf so his haid could be in New York and his tail in Bosting, den if yo all tromp on his tail in New Yo'k, he'd bark in Bosting. Now de radio am just perzackly de same, Rastus, wid de exception dat de dog am 'maginary."

Probably the best way for the inexperienced speaker to make use of this book both for the purpose of overcoming potential stage fright and finding subject matter for an expected speech, is to read aloud to himself the various pertinent speeches contained in the volume. They are all written in the proper conversational swing. Author Edgerton, who collaborated on "Thirty Complete Debates," has done a great service to the shy and bashful members of the human race by supplying this book to soothe their quaking moments.

**LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD  
OF MEDICAL EXAMINERS, MAY 24, 1932**

BY EXAMINATION

(April)

Name	School of Graduation	Address
Belzer, Meyer Simon.....	U. of Minn., M.D., 1931.....	K. C. Gen. Hosp., Kansas City, Mo.
Benesh, Norbert George.....	U. of Nebr., M.D., 1931.....	Asbury Hospital, Minneapolis, Minn.
Borland, Verl Gideon.....	U. of Minn., M.B. and M.D., 1932.....	University Hosp., Minneapolis, Minn.
Borman, Chauncey Nord.....	U. of Minn., M.B., 1931.....	Mpls. Gen. Hosp., Minneapolis, Minn.
Darnall, Charles Milton.....	U. of Texas, M.D., 1930.....	Mayo Clinic, Rochester, Minn.
del Plaine, Carlos Werter.....	U. of Minn., M.B., 1931.....	1633 E. River Ter., Minneapolis, Minn.
Deuterman, Joel LeRoy.....	U. of Va., M.D., 1930.....	Mayo Clinic, Rochester, Minn.
Farsht, Irving Joseph.....	U. of Minn., M.B., 1931.....	1124 N. Washburn Ave., Mpls., Minn.
Fine, Benjamin A.....	U. of Minn., M.B., 1931.....	699 Iglehart Ave., St. Paul, Minn.
Haines, William Henry.....	U. of Minn., M.B., 1931, M.D., 1932....	1218 W. Superior St., Duluth, Minn.
Hassett, Myron Frederick.....	U. of Minn., M.B., 1931.....	Mpls. Gen. Hosp., Minneapolis, Minn.
Herman, Samuel Morton.....	U. of Minn., M.B., 1931.....	711 Carroll Ave., St. Paul, Minn.
Johnson, Spencer.....	Rush Med. Col., M.D., 1929.....	Mayo Clinic, Rochester, Minn.
Johnston, Leonard Fredrick.....	U. of Minn., M.B., 1931.....	4816 Garfield Ave., Minneapolis, Minn.
Leck, Paul Clifford.....	U. of Minn., M.B. and M.D., 1931.....	Mpls. Gen. Hosp., Minneapolis, Minn.
Lindgren, Russell Cyrus.....	U. of Minn., M.B., 1931.....	Mpls. Gen. Hosp., Minneapolis, Minn.
Macy, John Willis.....	U. of Iowa, M.D., 1928.....	Mayo Clinic, Rochester, Minn.
Mears, Burtis J.....	U. of Minn., M.B., 1931.....	Miller Hospital, St. Paul, Minn.
Murphy, Cornelius Bernard.....	U. of Minn., M.B., 1930, M.D., 1931....	St. Luke's Hosp., St. Paul, Minn.
Nuetzman, Arthur William.....	U. of Minn., M.B., 1931.....	810 26th Ave. N. E., Minneapolis, Minn.
Olson, Paul Frederick.....	Rush Med. Col., M.D., 1932.....	Mayo Clinic, Rochester, Minn.
Peterson, Willard Henry.....	U. of Minn., M.B., 1931.....	2925 33rd Ave. S., Minneapolis, Minn.
Rogne, William Gustav.....	U. of Minn., M.B., 1930, M.D., 1931....	Casselton, N. Dak.
Schulze, Victor Ewald.....	U. of Texas, M.D., 1928.....	Mayo Clinic, Rochester, Minn.
Simonson, Sigwert Wallace.....	U. of Minn., M.B., 1931.....	Miller Hospital, St. Paul, Minn.
Sonnesyn, Nels Nitter.....	U. of Minn., M.B., 1931.....	Mpls. Gen. Hospital, Minneapolis, Minn.
Sterner, Ernest Russell.....	U. of Minn., M.B., 1931.....	1072 Portland Ave., St. Paul, Minn.
Stevens, George Arnold.....	Col. of Med. Evang., M.D., 1930.....	Mayo Clinic, Rochester, Minn.
Stuart, Frank Allan, Jr.....	U. of Tenn., M.D., 1930.....	Mayo Clinic, Rochester, Minn.
Trotter, Fred Oscar.....	U. of Minn., M.B., 1932.....	681 Lawson St., St. Paul, Minn.
Youngerman, William Martin....	U. of Cincinnati, M.B., 1930, M.D., 1931.	Mayo Clinic, Rochester, Minn.

BY RECIPROCITY

Chadbourn, Charles Rufus.....	Northwestern, M.D., 1931.....	203 Prescott St. St. Paul, Minn.
Furrer, Emil Daniel.....	U. of Ore., M.D., 1929.....	Mayo Clinic, Rochester, Minn.
Ingebrigtsen, Ernest K. G.....	Rush Med. Col., M.D., 1931.....	Moorhead, Minn.
McCrimmon, Herman Patrick....	U. of Okla., M.D., 1925.....	3130 Excelsior Ave., Minneapolis, Minn.
Niles, Sidney C.....	Northwestern, M.D., 1907.....	Hamm Bldg., St. Paul, Minn.
Nylander, Emil G.....	Chic. Col. M. & S., M.D., 1917.....	Ellsworth, Wis.

BY NATIONAL BOARD

Dwan, Paul Francis.....	Harvard Univ., M.D., 1928.....	4509 Dupont Ave. S., Minneapolis, Minn.
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## The Treatment of Pneumonia\*

JAMES GRAY CARR, M.D.  
*Chicago*

**I**N UNDERTAKING a discussion of the treatment of any disease consideration should be given to the pathology, the pathological physiology, and the means of altering either of these to promote the restoration of normal function or normal structure. When neither is possible therapeutically, treatment is concerned with the practicability of providing means for supplementing impaired function pending recovery if such may be expected. A consideration of pathology and pathological physiology may properly introduce a discussion of treatment.

Lobar pneumonia, characterized as it is by certain specific changes in the lungs which give the name to the disease, is not, however, a local disease, but a sepsis, which manifests not only the local pulmonary consolidation, but the injuries to other organs characteristic of sepsis in general. The first aim in the treatment of pneumonia is to combat the sepsis. It is only in recent years that the search for specific therapy has been rewarded, even in part, but a discussion of specific therapy is now no longer futile.

The pathological processes in the lung are most striking. In the affected pulmonary area, the alveoli are filled with coagulated serum and epithelial debris. In most cases in which consolidation is extensive this factor is of major importance in preventing proper oxygenation of the blood. However, the respiratory function has

\*Read before the Sioux Valley Medical Association, Sioux City, Iowa, January 26, 1932.

a wide margin of safety, and usually, as in the patient with an involvement of one or two lobes, it is not the diminution of the respiratory area, resulting from the decreased area of normal pulmonary tissue, which is responsible for signs of severe anoxemia and death. Diminution of the lung area may be aggravated by shallow breathing, due to the pain of pleurisy or to depression of the respiratory center in the nervous system produced by toxæmia, or to cardiac and vasomotor failure, which not only prevents proper oxygenation of the blood, but also seriously impairs the circulation and interferes notably with the supply of oxygen to the tissues. This anoxemia is aggravated by the accumulation of waste substances in the tissues which is due to incomplete metabolism in turn dependent on failure of oxidation.

The effects of the disease upon the circulation are partly due to the infection and its accompanying toxæmia. Often the heart shows evidence of myocardial disease, inflammatory or degenerative, which may co-exist. But other effects are probably of more consequence, especially in so far as added burdens are put upon a damaged heart.

In the usual case of pneumonia, pulmonary consolidation adds more to the work of the heart than to that of the lung. Even though one lobe is abruptly closed to the intake of air, the respiratory area available is far above the needs of the individual; no great strain, as we know from

observation of the milder cases of this type, is put upon respiration. But the heart must meet a demand for increased work with less reserve if we assume the frequent occurrence of myocardial damage. The vessels in the pneumonia area are obstructed by the surrounding inflammatory exudate, which materially adds to the work of the right heart. Impaired respiratory movement, the result of pain or consolidation, lessens, to a greater or less extent, the aid normally afforded to the pulmonary circulation by the respiratory movements. With progressive disease, increased respiratory rate and shallow breathing may cause an enormous increase of the burden upon the right ventricle.

Yet other factors are present. Blood forced through the consolidated area is not oxygenated. Thus, almost from the start, some venous blood finds its way back to the left auricle and is distributed through the greater circulation. Obviously, the proportion of such blood tends to increase with the duration of the disease and extension of the process. The anoxemia so characteristic of pneumonia is a severe test of cardiac efficiency. Some degree of failure of the pulmonary circulation is usually present in pneumonia. Thus the heart, stimulated to increased rapidity by the sepsis, with increased activity and lessened time for repair, struggling to overcome a steadily increasing pressure in the pulmonary circuit and damaged by toxins of the disease, must derive its own supply of oxygen from arterial blood which carries much less than the normal proportion of oxygen.

Of even more significance to the mechanics of the circulation is the vaso-motor failure, so commonly an accompaniment of this disease, and one which is often responsible for the fatal termination. This in its turn aggravates the tachycardia while it diminishes the return flow of blood to the heart. The fall of blood-pressure, emphasized by Gibson some years ago as of prognostic value, has its basis in this vaso-motor depression. Again we have an accumulation of ill-effects; the lowered pressure and the sluggish flow in the capillaries permit relative stagnation in the venous radicles; there is anoxemia and retention of carbon dioxide in the tissues and normal removal of waste products is diminished.

The vaso-motor impairment in pneumonia, though long known, is too often neglected. In 1895, Romberg and Passler reported the results of careful experimental work which led them to this conclusion:

For general pathology it follows that we must think

not only of the heart, but of vasomotor failure, in the circulatory disturbances clinically designated as cardiac weakness in the course of infectious disease. Alongside the cardiac weakness, we must place the vaso-motor weakness; alongside the cardiac paralysis, the vaso-motor paralysis.

As an effect of the sepsis, degenerative processes occur in the parenchymatous organs. Occasional intestinal paresis may add to the gravity of the disease by permitting abdominal distention with consequent damage to the circulatory and respiratory mechanisms. The significance of chloride retention, so long recognized, has not been explained.

Preliminary reference should be made to prophylaxis. It has been my experience that pneumonia frequently develops upon the basis of an existent respiratory infection. The minor infection, ignored by the patient who continues to work, is suddenly interrupted by a chill, following which the signs of pneumonia promptly appear. The patient with a "bad cold" who is able to rest and avoid exposure until the infection has subsided, is likely to avoid pneumonia. The contrary is true of the man who must continue at work involving exposure while he is suffering from an upper respiratory infection.

Alcoholism predisposes to pneumonia and, in its presence, the mortality of pneumonia is high. Age is a commonly recognized factor. The question of contagion is important. In large hospital wards we formerly saw occasional cases developing, which suggested very strongly the possibility of personal transmission. Such incidents have been rare since the segregation of patients with pneumonia has been instituted.

The role of carriers is somewhat uncertain, though there is much evidence in favor of the view that the contagion is conveyed by carriers. Dochez and Avery found that organisms of typical type might, at times, be isolated from the mouths of healthy individuals, but also found that:

So far this has occurred only in individuals intimately in contact with cases of lobar pneumonia. Wherever typical organisms have been obtained under such circumstances, the type has always corresponded to that with which the case of pneumonia was infected. Such individuals, therefore, become infected with virulent types of pneumococcus by contact, and may be regarded as healthy carriers of disease-producing types.

They state further:

This study makes it probable that the majority of cases of pneumonia are dependent upon either direct or indirect contact with a previous case.

Prophylactic immunization has been the subject

of much investigation and discussion. In 1919, Cecil and Vaughan reported on the vaccination of 13,400 men, 80 per cent of the total strength, at Camp Wheeler. Pneumococcus lipovaccine was used. Dosage was 1 c. c. of the lipovaccine, containing approximately ten billion each of Pneumococcus Types I, II, and III. Both the local and general reactions were usually mild. Most of these men were under observation for two or three months, and during this period there were thirty-two cases of pneumonia of one of these types among the vaccinated, and forty-two cases of pneumonia of these types among the unvaccinated—one-fifth of the camp. If all cases of pneumonia that developed within one week after vaccination are excluded from the vaccinated group, there remain only eight cases of pneumonia produced by fixed types, and these were all secondary to severe attacks of influenza. There is no evidence whatever that pneumococcus vaccine predisposes the individual even temporarily toward either pneumococcus or streptococcus pneumonia . . . of the 155 cases of pneumonia (all types) developing one week or more after vaccination, 133 were secondary to influenza. The death rate for 155 cases of pneumonia (all types) that developed in vaccinated men one week or more after vaccination was only 12.2 per cent, whereas the death rate for 327 cases of all types that occurred among unvaccinated troops was 22.3 per cent. The death rate for primary pneumonia among vaccinated troops was 11.9 per cent; among the unvaccinated troops it was 31.8 per cent. The mortality for pneumonia secondary to influenza was about equal for the two groups.

Cecil and Blake found that subcutaneous inoculation of monkeys with pneumococcus Type I vaccine in doses comparable with those employed in man does not protect them against subsequent attacks of pneumococcus Type I pneumonia, either spontaneous or experimental. Vaccination, however, does modify the course of the disease. Blood stream invasion in vaccinated animals is usually slight, and the proportion of recoveries is considerably higher for vaccinated than for unvaccinated monkeys.

The value of prophylactic immunization is still *sub judice*; not much has been added to the literature since the earlier reports published at about the period of the influenza epidemics. In the latest edition of Osler this statement is made:

The evidence suggests that there is value in vaccines as a preventive, but the immunity produced is of short

duration. When done it should be regarded as an experiment and careful records kept.

Sylla of Halle in an extensive review of the etiology and treatment of pneumonia makes no reference to vaccine therapy, prophylactic or curative.

The specific treatment of pneumonia has been the subject of experiment in the laboratory and at the bed-side for forty years. In the second edition of his text book, Osler tells of the interesting work carried on by the brothers Klemperer in Leyden's Clinic on the immunity to pneumonia in experimental animals. Even then it was hoped that the serum of convalescents might prove useful in treatment.

Nothing came of this line of study until Neufeld and Handel in 1910 provided an exact basis for serum therapy by their recognition of the different types of pneumococci. This work was particularly developed at the Rockefeller Institute, and in 1913 at the meeting of the A.M.A., Cole presented the results of his studies and defined the four principal groups of pneumococci, at the same time reporting seventeen cases of pneumonia treated with immune serum. Fourteen of these showed infection with Type I, three with Type II. One patient died from each of the two groups. At the same session Dochez and Gillespie presented their work on the differentiation of the various types. Large amounts of the Cole serum, from 80 to 120 c. c. every eight hours, were required until the temperature dropped and the patient showed definite improvement.

Dochez and Avery state that:

By the use of immune sera prepared in this country, Professor Neufeld has demonstrated the existence in Germany of groups of pneumococci having immune reactions identical with organisms belonging to our groups I and II. . . . Lister has described five groups of pneumococcus among the strains studied by him in South Africa. Three of these groups are identical with the groups met with in North America and Germany. The other two groups, one of which appears to be dominant in South Africa, have not as yet been found in the cases of pneumonia studied by the writers.

In 1929, Cole presented a paper on the results in four hundred thirty-one patients with pneumonia due to Type I pneumococcus at the Hospital of the Rockefeller Institute since 1913. Of these, forty-four died. "A review of the fatal cases indicates that if serum therapy was not effective in this group of cases, no other form of specific therapy would likely have been of much greater value." . . . It was Cole's opinion that "the present method of treatment with large doses

of serum is not ideal. The methods [standardization of concentrated serum] now being used present certain difficulties, and it is seriously questioned whether by these methods a picture of the actual effectiveness of the product can be obtained. . . . Unless very large doses of concentrated serum are employed, or unless some more accurate method of standardization is adopted, it is better to continue to treat cases of Type I pneumonia with good, whole serum in large doses."

Cecil and Plummer state that Type I pneumonia is the most common form of lobar pneumonia, constituting almost one-third of all lobar pneumonias in Bellevue Hospital.

Observations of Cole have been abundantly confirmed by other investigators. It must be admitted that such a prompt and striking clinical effect is not observed in every case, and that the patients most likely to yield satisfactory results are those who receive serum early in the disease.

The use of Huntoon's anti-body solution, a water-clear solution of anti-pneumococcal immune bodies, polyvalent for Types I, II, and III, is one method of serum therapy which they employed. In two years, 171 cases of Type I pneumonia were treated with Huntoon's serum, with a mortality of 14 per cent. In fifty-six cases admitted within forty-eight hours after onset the mortality was 8.9 per cent. Sixty-eight control cases admitted within forty-eight hours of onset, showed a mortality of 23.5 per cent. Large doses were necessary: a severe chill and sharp rise of temperature characterized many cases. The severity of the reaction has been mainly responsible for the disuse of this type of anti-pneumococcus serum.

They further describe their results with the concentrated Type I anti-pneumococcus serum of Felton. In general, they "tried to administer from 100,000 to 200,000 units (from 40 to 100 cc.) during the first twenty-four hours of treatment" and state that:

It is our present conviction that in most cases serum treatment should be completed in forty-eight hours; that is, if results are to be obtained at all, they will usually be obtained within that time, and further:

A series of 239 cases of Type I pneumonia treated with Felton's serum shows a death rate of 20 per cent, as compared with a mortality rate of 31 per cent in a control series of 234 untreated cases. There is a further reduction in death rate to 11.7 per cent in cases treated within seventy-two hours after onset. Type I serum is no longer in the experimental stage. When administered early and in adequate dosage, the clinical results are striking. The present study demonstrates

that concentrated serum possesses all the therapeutic value of the unconcentrated preparation. Furthermore, concentrated serum has a much higher potency and a lower content of chill-producing substances and horse serum proteins which make it more easily administered, and less frequently followed by chills, serum reactions and serum sickness.

Similar views have been expressed by Park, Bullowa and Rosenbluth from the Harlem Hospital, Mills from the Montreal General; Cowan, Cruickshank, Cuthbertson, Fleming and Harrington from Glasgow; and by a group of physicians to the Royal Infirmary in Edinburgh; and many others. On the basis of these and other reports, the Council on Pharmacy and Chemistry, early in 1931, accepted Type I anti-pneumococcus serum. In Germany the value of the serum is not generally accepted. Krehl has advocated its use, as have some other leading clinicians, but the prevalent opinion is that this form of therapy has shown no significant superiority to others which are less costly or well-established.

Vaccine therapy has also been the subject of investigation, with suggestive and hopeful results, but with no such approach to certainty as has characterized the studies of Type I immune serum. In 1926, Lambert reported a series of cases treated with mixed vaccines with surprisingly favorable results.

Sutton and his co-workers have also contributed to this subject. Sutton, Kendall and Rosenblum report on the use of "Natural Bacterial Antigens." One hundred twenty-nine cases of pneumonia, all types, anatomical and bacteriological, were treated with this vaccine with a mortality of 22.5 per cent. Three hundred thirty-nine controls showed a mortality of 42.1 per cent. The authors believe that these results "compare favorably with the results reported with the use of anti-pneumococcus serum; since these results "are on even terms with the specific sera, the vaccine should be used until its value is determined." Zinsser has expressed the opinion that vaccine therapy may become of great importance.

Aside from quinine and certain of its derivatives, there is no chemotherapy for pneumonia, no drug which is entitled to any consideration as curative in pneumococcal infections. Sylla makes the statement that Aufrecht introduced the use of quinine as a specific remedy in pneumonia. It is still extensively used in Germany. Quinine hydrochloride (soluble) and Quinine-urethan are given, the first intravenously, the second, intramuscularly. The latter is painful and may cause necroses and abscesses. A recent questionnaire

of leading German clinicians revealed a number who advocated the use of quinine in pneumonia. Sylla further says:

The results of the quinine therapy are quite satisfactory according to the reports at hand. Internal administration has not commended itself. Cahn-Bronner has investigated quinine therapy on a large material. As his average mortality in 977 published cases treated with quinine, Cahn-Bronner gives 9.6 per cent, in 1275 control cases, 20 per cent.

It is difficult to evaluate such reports. Quinine has never found such favor in America.

About 1916, Morgeroth and Levy introduced a quinine derivative, optochin, as a remedy for pneumococcus infections. Aethylhydrocuprein (optochin) was used for a time. Favorable reports appeared, but it quickly developed that certain toxic effects, especially affecting vision, occurred often enough to make the use of this preparation inadvisable. The dose required for therapeutic results was dangerously near the toxic dose. Optochin became practically obsolete in America. Recently Optochin Base has been recommended, as equally effective for therapeutic purposes but less likely to cause toxic symptoms. It is said to be absorbed less rapidly.

Sylla describes the method of Mendel, whereby optochin base is given at regular intervals of four or five hours in single doses of about four grains. The duration of this treatment is not stated, but other opinion is adverse to continuance of administration for more than three days. With each dose eight ounces of milk is given; the diet consists only of milk with yolk of egg, chocolate, coffee, and sugar. "With this diet Mendel aims to inhibit the rapid solution of the optochin by the hydrochloric acid of the stomach and provides for an evenly distributed resorption.

Sylla concludes his review with the opinion that, "Optochin with careful dosage of the base, or in combination with the salicylic acid ester in association with Mendel's milk diet gives right good service." The fact that the necessity of preventing rapid absorption of the optochin is so strongly emphasized is evidence that the use of this preparation implies a certain element of danger. Thus far, optochin and optochin base have not been generally accepted as safe or effective remedies for pneumonia. The use of these preparations is still in the experimental stage.

We turn now to the group of agents which are used, not because of presumed specific properties, but for the relief of symptoms. The first of these is oxygen. Much of our progress in the use of oxygen, such as better defined indi-

cations for its use and improved technique in the methods of use which make results more certain and prompt, we owe to Barach and his co-workers. Oxygen is not a specific cure for pneumonia. It is used to combat the anoxemia and thereby to prolong the patient's life, thus affording a longer period in which the patient may produce his own anti-bodies.

Hence, the use of oxygen is indicated early; to wait until the patient is desperately ill is to miss the point in the employment of oxygen. The old method of the use of the oxygen delivered close to the face through a cone has been shown to be of little value. The oxygen content of the inspired air has shown no increase when the oxygen is administered this way. Where this method alone is practicable, the nasal catheter carrying oxygen from a high-pressure tank will deliver sufficient oxygen to enrich the inspired air. The catheter should have several perforations near its end in order that a high pressure current delivered through a single opening may not irritate an exposed area of the mucous membrane. The satisfactory methods for the use of oxygen are the tent or the chamber. A well-equipped hospital should have some form of modern appliance suitable for effective oxygen therapy.

In the first edition of his *Practice of Medicine*, published in 1891, Osler expressed himself thus: "No certainty has yet been reached as to the value of digitalis in the failing heart in fever. The practice is very general, but it is a drug to be used with caution in this condition."

Though this was written more than forty years ago, it is pertinent today; the present attitude toward the use of digitalis could hardly be better expressed. Through the early years of this century there was no unanimity regarding the value of digitalis in pneumonia. I recall that some of our clinical teachers were skeptical regarding any favorable effect of this drug. As an interne at the Cook County Hospital, I learned to use, rather than digitalis, strychnine, which has been discarded almost entirely.

As a brief review of the history of digitalis medication in pneumonia since 1916, I wish to quote a paragraph from the paper of Niles and Wyckoff:

The observation that digitalis failed to slow the heart in fevers led many clinicians to doubt if it produced any effect in pneumonia. In 1917 Cohn and Jamieson demonstrated that the drug produced in the pneumonia heart the same electrocardiographic changes that were found in normal controls. Cohn had concluded in 1916 "that digitalis did not harm and it might be life saving" and reported that, therefore, digitalis

was given to all pneumonia patients at the Hospital of the Rockefeller Institute as a routine. Since that time it has been widely used in pneumonia, and has generally been given as a routine on the three Medical Divisions of Columbia University, Cornell University and New York University at Bellevue Hospital. The attending physicians, however, were doubtful of its effect on the mortality rate and believing that unusual opportunities for further study were available at Bellevue Hospital, in 1927 formed a committee to organize and supervise a study of the effects of digitalis in pneumonia. The observations were carried on continuously throughout the years 1928 and 1929 and are the basis for this report.

The patients studied included 338 to whom digitalis was given and 404 controls. These were studied from various viewpoints, as to age, sex, type of infection, septic complications, etc. The authors conclude their report thus:

Although the Committee would prefer to continue the investigation on the results of digitalis therapy in pneumonia and observe a number of cases over a series of years, it was the unanimous opinion of the Committee and its advisers that the results obtained thus far do not justify continuing the routine administration of digitalis to patients suffering with lobar pneumonia.

While this conclusion may be regarded by some as an extreme view of the subject, the value thereof cannot be denied. A group of men, after careful investigation, refused to continue the study because they could not justify to themselves the routine use of digitalis in pneumonia. It appeared to be harmful rather than helpful.

From the theoretical standpoint digitalis has little justification. The effect of digitalis in slowing the heart with regular rhythm is still under discussion. There is much to be said for the view that slowing of the rate when the rhythm is regular occurs only as the result of restoring compensation when congestive failure has occurred, and that the slowing occurs under these circumstances only as restoration of compensation is effected. With restoration of compensation, which results from increased muscular efficiency produced by digitalis, the distention of the auricles is diminished, and the reflexes from the distended auricles which serve to quicken the heart are thus suppressed.

Finally, we must refer to the work of Romberg and Passler. So-called cardiac failure in pneumonia, though the increased burden on the right heart must be admitted, is usually not cardiac but general vaso-motor failure. It is for the latter that we have failed to find a remedy. To overlook this phase of the subject, and to depend on digitalis in spite of these facts is to

blind ourselves to the real requirements in pneumonia and prevent progress.

The statements may be summarized thus:

(1) It has not been proven that digitalis strengthens or slows the heart in febrile diseases.

(2) There is no evidence that digitalis exerts a favorable influence on the vaso-motor failure of pneumonia.

(3) The clinical evidence in support of the favorable effect of digitalis in pneumonia is equivocal, at least. From one group of workers with ample material for study, has come a report indicating that digitalis thus used is injurious rather than remedial.

(4) In cases of pneumonia with auricular fibrillation, the conditions are different. Here digitalis is indicated, as the indications for the use of digitalis to control the ventricular rate in auricular fibrillation are present.

The various other drugs employed as stimulants may be dismissed with much the same comment. Caffeine, camphor, adrenalin and pituitrin are a few of the remedies suggested as circulatory stimulants. While their use is widespread and their value is commonly accepted, there is neither experimental nor clinical evidence which may be regarded as proving the value of these drugs.

The use of sedatives in pneumonia is a question of importance. Here again, widely different methods of treatment have been employed. There are those who decry the use of sedatives, especially opiates, others who employ them too readily, and a third group which approves their use in the presence of certain indications.

The pain of pleurisy is often exquisite, so severe as to aggravate, occasionally seriously, the dyspnoea and cyanosis of the disease. Morphine should be employed to relieve these more severe types of pain. Milder analgesics or local applications may avail in some cases, but the patient should not be allowed to lose his morale nor should the anoxemia be aggravated because of pleural pain. For the cough, codeine in small doses is usually sufficient. A constant hacking cough, wearing out the patient's strength by its persistence, may require an occasional dose of morphine.

The patient with pneumonia who is quiet, even though he does not sleep, needs no hypnotics. Most patients with pneumonia will sleep little; this may be ignored unless it is associated with restlessness. Milder hypnotics are usually effective here. Where delirium is present, a further problem is presented. While delirium is always

an unfavorable sign, milder forms do not require much treatment; the general management of the case will have much to do with lessening the importance of delirium, and a good nurse is often able to control such a situation without special medication.

The use of the commonly employed hypnotic drugs to control delirium is a questionable procedure. Often these leave a "hangover" of depression and mental confusion which actually aggravates the delirium. It is my opinion that where delirium requires medicinal control, morphine should be used, because of its greater likelihood of having a satisfactory effect. The patient with active delirium always presents a bad prognosis; he veritably is engaged in beating out his own life. Under these conditions it is legitimate and wise to attempt, by the use of morphine, to protect him from his own activity.

The mention of delirium brings up the much discussed question of alcohol, about which opinion has varied greatly. In his first edition, in discussing the problem of circulatory failure, Osler says:

To meet this indication the general experience of physicians still points to alcohol as the most trustworthy remedy. Altho some hold that alcohol in this condition is not indicated, I believe that it is in many instances the only remedy capable of tiding the patient over the most dangerous period.

This position was modified later, until in the edition published in 1916, the subject was referred to thus:

Alcohol is generally advisable, best as whisky in amounts of four to twelve ounces in the twenty-four hours.

In the last edition, revised by MacCrae, the only mention of alcohol is that, "Alcohol should be given to chronic alcoholics." Edwards in the second edition of his text-book published in 1909 recommends alcohol highly:

Alcohol is invaluable, whatever its action; it is second only to strychnine and is indicated by collapse or cardiac toxemia, in which hot whisky and water unquestionably stimulate by reflex action on the throat and stomach.

Opinion was shifting during the first two decades of this century. Gradually the use of alcohol in pneumonia was notably limited, almost indeed discarded. In 1922, Cole stated that:

During the past ten years in the Hospital of the Rockefeller Institute it (alcohol) has been used very rarely and absolutely no ill effects have been observed from its withdrawal. . . . The only cases in which

the question of the giving of alcohol should arise are those giving a history of alcohol addiction.

About the same time, Wynn in an English medical journal expressed the view that:

There is no scientific reason for the use of alcohol (in pneumonia) which is mainly based on tradition and the popular idea that it is a stimulant. Apart from its very fleeting stimulating effect, produced reflexly by the irritation of mucous membranes, its chief actions are to depress the nervous system and to inhibit antibody formation, neither of which is desirable in diseases whose toxins are also nerve depressants.

My own experience coincides so nearly with that of Cole that the results might be expressed in the same words. For more than ten years, no alcohol has been used in the treatment of patients with pneumonia, except in occasional cases in chronic alcoholics. Many of this latter type have been treated without alcohol. This failure to employ alcohol in pneumonia has not increased mortality. My own impression is strong that the incidence of wild delirium and of alcoholic delirium has been less than it was when alcohol was commonly employed and my own experience justifies repetition of the statement of Cole, "Absolutely no ill effects have been observed from its withdrawal."

There remain for discussion three subjects, fresh air, nourishment, and distention, all of which may be briefly dismissed, not however, because of lack of importance. All are important and much of the physician's success is dependent upon attention to these less spectacular particulars.

The air in the room should be cool and fresh, not so cool as to make it uncomfortable for the nurse to remain in the room reasonably clad for indoors. Provision for fresh air should be made; when possible the air should produce some current, for stagnant cool air is not ideal. The cold air treatment so widely used a few years back failed to meet expectations. To children and old people it was often harmful; to a large majority of patients unwelcome, and for attendants and nurses difficult.

The nourishment should be ample, consisting of bland foods with high caloric values, and should be given at frequent intervals. Plenty of water and fruit juices is indicated. Some caution is desirable here, for oftentimes an overzealous nurse will push these to extremes, perhaps causing nausea or even distressing abdominal or reflex symptoms because of gastric distention. Milk, cereals, puddings, cooked fruits, and soups may form the basis of the diet.

Abdominal distention may be due to the intake of too much food or of improper food, or it may occur because of lack of attention to evacuation of the bowels. This variety of distention, which usually responds to proper treatment, may merge into the second type, always severe and ominous.

Even in the milder cases the distention is probably partly due to the toxemia; in the more severe, the toxemia is responsible for a paresis, oftentimes marked, of the bowel. Under these circumstances, treatment is of little use. Attention to the bowels should be careful from the first. In the presence of a tendency to distention, enemata and dietetic measures should be directed to its control. If neglected, this disposition to distention is likely to become aggravated. Where the suggested measures fail, the use of pituitrin, of the rectal tube, and of turpentine stupes may be helpful.

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## The Inefficiency of Physical Signs in the Diagnosis of Pulmonary Cavities\*

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THE presence or absence of a cavity is an important factor in both the prognosis and therapy of pulmonary tuberculosis. In the days before the wide-spread use of the X-ray, eminent internists described many classical signs as diagnostic of pulmonary cavities. These signs, without any improvements, have been carried down in text-books in order to aid the student, general practitioner, and specialist in diagnosing cavities through physical examinations.

With the arrival of X-ray diagnosis, the roentgenologist observed annular shadows on a variable number of chest plates. These annular shadows had not been previously detected on physical examination, yet they could not be considered normal. The pathologists then proved on the autopsy table that they were cavities.

In 1921 and 1922, Thompson and Barlow<sup>1, 2, 3</sup> published their observations of both their physical examinations and X-ray plate readings. Their conclusion was that, through the use of

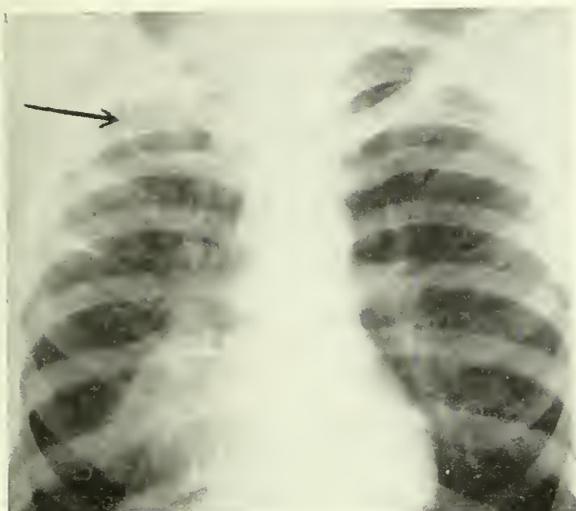
special X-ray technique or careful physical examination, they could detect localized pneumothoracies. They also concluded that the presence of these localized pneumothoracies were diagnostic of tuberculosis and that they were quite commonly observed. Their criterion of diagnosis was based on the definite separation of pleural surfaces.

They also state that the majority of conditions which are diagnosed as dry cavities are not really cavities but small pneumothoracies in which the physical signs are unusually striking.

No autopsy reports were given to substantiate their claims except that they mentioned that the method by which lungs are removed from the autopsy specimen is sufficient to destroy the presence of a small pneumothorax.

Pindell<sup>4</sup> reports that out of 375 autopsies at the Fitzsimmons General Hospital, 349 had cavities, all of which were seen previously on the X-ray. A few localized pneumothoracies were seen, but these did not produce any X-ray findings.

\*Presented before the Lymanhurst Medical Staff, January 26, 1932.



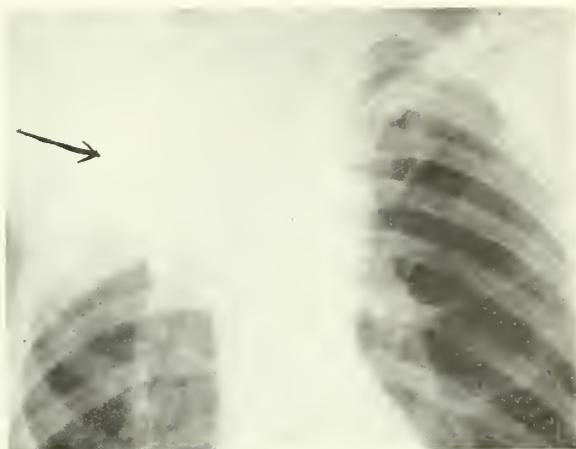
CASE J. T.

The report of Pindell is actually based on autopsy findings which were so positive that only one conclusion could be drawn.

I follow the contention that all annular shadows should be diagnosed as cavities unless proved otherwise, and, that the X-ray films be used here as a standard because, as yet, the X-ray offers the most accurate means of diagnosing pulmonary cavities.

The roentgenologist and the phthisiotherapists then began to observe, through X-ray plates, that the incidence of cavities as a complication of pulmonary tuberculosis was far greater than physical examinations led them to believe. Could it then be that the classical signs such as, pectoriloquy, amphoric breath sounds, consonating rales, the cracked pot sound, wintrich's sign, post-tussic puff, etc., need too many favorable factors before they can be elicited, or are these signs too coarse to appear over all cavities? Whatever the answer may be, we must face the fact that, as in the early diagnosis of pulmonary tuberculosis, physical signs alone often fail us.

At the Minnesota State Sanatorium forty-one patients on service B were found to have



CASE S. W.

cavities as shown by annular shadows on X-Ray examinations. Of these forty-one, twenty-five showed two or more areas of excavation. In all there were fifty-seven areas of excavation, or annular shadows. These fifty-seven areas form the basis for my study.

As shown in Table 1, twenty-nine out of fifty-seven did not reveal, on physical examination, any signs which could be interpreted as suspicious of underlying cavitation. This then would mean that 50.8 per cent were silent cavities. One case revealed several signs suspicious of cavitation, but on the X-ray film this was shown to be an area of fibrosis. This case is reported later.

Out of the twenty-eight areas that did reveal suspicious signs, two presented post-tussic puff and one presented localized consonating rales as the sole suggestive sign.

TABLE 1

Cases	Areas of Rarefaction	Two or More Physical Signs	One Sign Post-Puff	C-Rales
Cavities with positive physical signs	28	25	2	1
Cavities without physical signs	29			
Total	41	57		

Two cases present signs in the neighborhood of cavities but not over the cavity. One case presents signs, but no cavity is present.

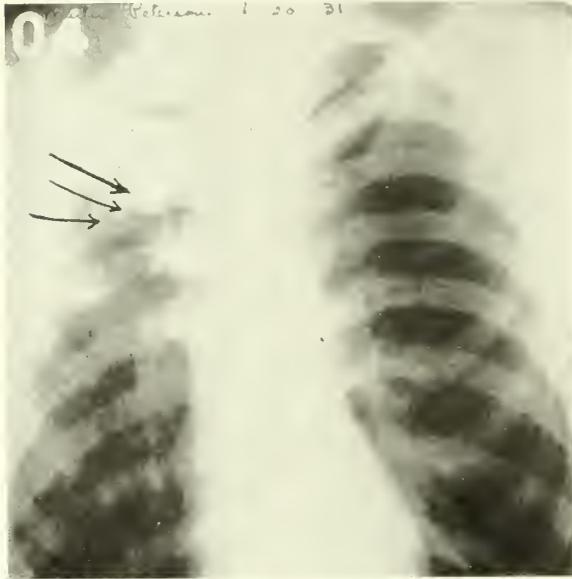
TABLE 2

Cavities	Number	Sputum		Diam. of Cavities				Multiocular Multiple
		Pos.	Neg.	1.5 cm. or Less	2.0-3.0	3.5-5.0	5.5 and Up	
Cavities with positive physical signs	28	24	4	2	5	6	4	11
Cavities without physical signs	29	24	5	2	4	5	3	15
Total	57	48	9	4	9	11	7	26

TABLE 3

Cavities	Cough				Expectoration					
	Mild	Moderate	Severe	0 to Scant	½ oz.	1 oz.	2 oz.	3 oz.	6 oz.	10 oz.
Cavities with positive physical signs	17	9	2	6	0	4	8	7	4	2
Cavities without physical signs	20	5	4	13	1	3	3	4	2	0
Total	37	14	6	19	1	7	11	11	6	2

It is very interesting to note that when the sputum, cough, and expectoration are analyzed, there is very little difference, if any, between the cavities with positive physical signs and those without.



CASE L. H.

It becomes apparent, then, that, except for the actual physical signs which we use here for differentiation between these two types of cavities, there is no way of foretelling whether or not a cavity will have the physical signs attributed to it; however, the analysis does show that cavities with positive signs tend to have more expectoration, yet, six cavities with positive signs showed no sputum, while two others with four ounces of sputum had no physical signs. This is too great an error to be dependable as a criterion. It is logical to assume, then, that a cavity case with a fair amount of sputum will not necessarily give positive physical signs.

My conclusions, therefore, are: first that there is no reasonably certain way of detecting a cavity by physical examination; second, that the amount of expectoration, the severity of the cough, or the size of the cavity does not necessarily determine the occurrence of physical signs.

Fales<sup>5</sup> found that in ninety cases with cavitation, 99 per cent were diagnosable by X-ray and only 20 per cent by physical signs alone.

Dunham and Darby<sup>6</sup> in their work concluded that cavities could be diagnosed by physical examination in 70.1 per cent of cases when

present in the upper lobes, and only in 30.4 per cent when present in the lower lobes.

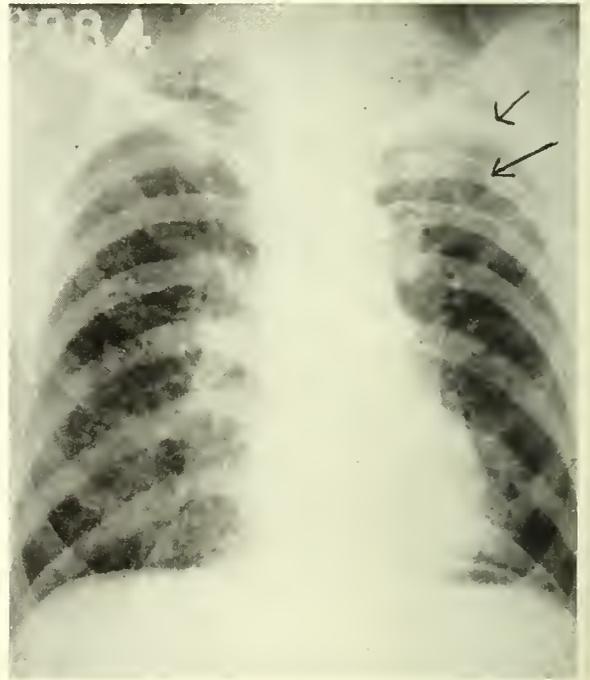
Bendove<sup>7</sup> found that in 145 cavities, 55 per cent were silent. Other workers obtained as high as 80 per cent silent cavities.

The work of Fales, Dunham and Darby, and Bendove, coupled with my observations as detailed in this report emphasizes the fact that one should not depend solely on physical examinations in attempting to diagnose all cavities, but should also avail himself of the X-ray examination. This does not mean that physical examinations should be dropped, but rather that the physical examination, as is true of any other diagnostic method, has its limitations.

The following cases are only a few of those observed, but are reported here because of their clear-cut examples of misleading physical signs.

CASE I. J. T., male aged 18. Malaise, Feb., 1931, hemoptysis, April, 1931. Pos. sputum, May, 1931. Cough, slight. Exp. 1 oz. daily. Pos. sputum. On X-ray, cavity 6.0 cm. in diameter, with fluid level. Unable to detect by physical signs. Absolute silent cavity.

CASE II. M. P., male aged 33, pleuritic onset, October, 1930. Cough moderate to severe. Exp. 6 ozs. daily.



CASE M. P.

Positive sputum. Multiple cavitation on X-ray. Unable to detect by physical signs. Relatively silent cavity.

CASE III. S. W., male aged 51, pleurisy with effusion, 1926. Cough and expectoration, October, 1930. Fatigue and night sweats, December, 1930. Positive

sputum, December, 1930. Cough slight. Expectoration scant. Sputum now negative. Physical findings: Decreased resonance to second rib and fourth dorsal spine, amphoric b. s. marked pectrolliloquy with amphoric quality over dull area. No rales. X-ray revealed marked fibroses and no cavitation.

CASE IV. L. H., male aged 30, exposed to sister, 1929. Felt well until hemoptysis, June, 1931. Lupus erythematosus in 1926. Physical signs. Cons. rales, bronchial breath sounds. Increased whispered voice and decreased resonance—all confined to a localized area beneath clavicle. X-ray revealed pneumonic consolidation beneath area of physical findings and cavity beneath consolidation with no physical findings over the cavity itself.

#### SUMMARY

1. Twenty-nine or 50.8 per cent of cavities were silent on physical examination.

2. Fifteen or 51.77 per cent of the silent cavities were found to be multiple or multilocular on physical examination.

3. Eight or 27.5 per cent had a diameter of 3.5 cm. or over (excluding multiple or multilocular cavities).

4. Thirty-four or 82.9 per cent of the 41 cases analyzed had positive sputum.

5. The amount of sputum and cough were essentially the same in silent or positive cavities.

Whenever an area showed two or more of these signs: pectoriloquy, consonating rales, amphoric breath sounds, cracked pot sound, post-tussic puff, Wintrich's sign, I considered that sufficient for a diagnosis of suspicious pulmonary cavity.

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## Mesenteric Vascular Occlusion with Report of Two Cases\*

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A RECENT discussion at a hospital staff meeting following the report of a case of mesenteric thrombosis showed that the older literature there reviewed painted a darker picture than more recent reports and local experience indicated. Cases were mentioned, some with successful resection, that had never been reported. Inadequate reports probably account in part for the meager descriptions in many texts. The infrequent occurrence of this condition in any individual practice would seem to justify the report of all cases completely studied as they occur.

Trotter<sup>1</sup> in 1913 reviewed 360 cases reported to date and added 6 of his own with correct diagnosis in 13. Jackson<sup>2</sup>, Porter and Quinby previously had reviewed 214 cases, and quoted a total mortality rate of 94 per cent and operative mortality of 92 per cent. Ross<sup>3</sup> found two cases in 30,000 surgical admissions in Laukenau Hospital in Philadelphia and reported 6 cases with one recovery. At the Boston City Hospital with 6 cases reported in nine years, one observer<sup>4</sup> became interested and found 8 cases in 1 year. Brady<sup>5</sup>, in 1923, found 14 cases of mesenteric vascular occlusion in the records at the Johns Hopkins Hospital and declared that the picture cannot be distinguished from intestinal obstruction due to other causes. Five out of eight operative cases died, a rate of 62 per cent. He con-

tended that hope of saving more lives depended not upon the recognition of mesenteric thrombosis but of an acute abdominal condition demanding immediate surgical interference. Klein<sup>6</sup> states that up to 1921, 24 successful resections were recorded following the first successful resection by Elliot<sup>7</sup> in 1895. Brady stated that until 1923 there were about 500 recorded cases of mesenteric thrombosis and embolism with not more than 35 recoveries. In a survey of the available literature since then nine additional reports of successful resections were found.

That mesenteric vascular occlusion may be compatible with life is shown by such reports as those of Nazari<sup>8</sup> who found seven cases in 1700 autopsies, and of Schley<sup>9</sup> who found in 1600 autopsies at Johns Hopkins four cases of arteriosclerotic occlusions that caused little or no symptoms; also by cases reported by surgeons who found occlusion at laparotomy but with sufficient collateral circulation to allow retention of the bowel and recovery of the patient. Klein collected nine authentic cases of vascular occlusion with spontaneous recovery in some of which diagnosis was confirmed at laparotomy and added one. To quote from Welch's<sup>10</sup> article in *Albutt, System of Medicine*, "intestinal infarction is not the imperative result of occlusion of the interior mesenteric artery . . ." as infarction is of occlusion

\*Read before the Minneapolis Clinical Club, March 11, 1932.

of the branches of the splenic and renal arteries. Later "the rapid and complete closure of the inferior mesenteric artery, however, is followed with great regularity, probably constantly, by hemorrhagic infarction of the intestine." Larson<sup>11</sup> in 1931 reviewed the pathological findings in 36 cases at the University of Minnesota, including the two cases reported in this paper, and found 39 per cent were arterial, 44 per cent venous, and 17 per cent combined. Venous obstruction followed hepatic disease in 25 per cent of the cases. The source of the vascular occlusion was unknown in 8 out of 36 cases, and hemorrhagic infarction resulted in 31 out of 36 cases. The lesion from vascular occlusion may vary from one very minimal with rather complete and prompt establishment of collateral circulation to rapid hemorrhagic infarction of the intestine. The venous occlusion is due to thrombosis alone and therefore tends to be less abrupt in onset than the arterial type. A condition of intermittent mesenteric claudication is described. Schmitzler<sup>12</sup> reported a case of attacks of colic and constipation, brought on after meals and the extra vascular work of digestion, similar to intermittent claudication. In fact, Councilman<sup>13</sup> reported fatal intestinal obstruction in arterial closure without infarction.

It should be remembered that the superior mesenteric artery supplies the whole of the small intestine except the superior part of the duodenum, also the caecum, ascending colon and one-half of the transverse colon. The anastomoses at either end of the arterial scheme are comparatively small; proximally with the inferior pancreaticoduodenal artery traversing six vessels decreasing in size, and distally, a branch of the middle colic with a branch of the left colic from the inferior mesenteric artery. Anastomosing arcades are formed by the 12 to 16 mesenteric vessels that anastomose only among themselves and branches of the superior mesenteric artery and exist only in the center of the area supplied by the superior mesenteric artery.

The interest of the internist in a condition essentially surgical as to treatment lies in its etiology. For while it may appear out of a clear sky and while the venous type is often an intra-abdominal sequence following appendiceal, pelvic, or other suppurative processes, or hepatic disease, mesenteric arterial thrombosis and embolism is often essentially a cardio-vascular sequence. Any cardiac condition favoring the developments of auricular thrombosis and resulting embolism is a potential source. Also high grade

arterio-sclerosis of the aorta, coronaries, and arteries of the extremities may often be associated with mesenteric arterio-sclerosis with its predisposition to endarteritis and thrombosis. Symptoms of intestinal obstruction supervening in an individual without malignancy, without causes of peritonitis such as a ruptured viscus, with cardiovascular disease, potentially a source of embolism or thrombosis, suggest the consideration of occlusion of some part of the mesenteric vascular bed. This is particularly true if the sudden onset with pain and prostration suggests embolism and is followed by the symptoms of intestinal obstruction and later peritonitis. Less often may venous occlusion from suppurative abdominal and pelvic conditions be recognized. While a diagnosis can seldom if ever be positively established, a recognition of the not infrequent occurrence of mesenteric occlusion will help in emphasizing the importance of early surgical interference especially if a vascular origin is suspected. While it would be presumptuous to attempt clarification of the diagnostic criteria of a condition which has been well studied pathologically and clinically, it is believed that emphasis upon habitual thinking in terms of pathological sequence will favor the earlier recognition of this condition and increase the opportunity for resections before the patient is moribund.

CASE NUMBER 23941. (Abbott Hospital). Male. Age 75. Christian Science Practitioner. Married. The patient was seen in consultation with Dr. G. R. Dunn with the complaint of severe abdominal pain. The present illness started about eighteen days previously with a sudden attack of severe abdominal pain which became intermittent and colicky in nature. Distension that developed was not relieved by enemas. Vomiting occurred twice during the first attack of twenty-four hours duration, to be followed in three days and one week by similar attacks that gradually subsided. Three days before admission there was an attack of sudden severe abdominal pain, increasing distension, and dark emesis at last projectile. The pain had become so severe that even though a Christian Science Practitioner a physician was called. Since the first attack, precordial pain, dyspnoea, and irregularity of pulse had been noted, also nocturia. About four months previously he was said to have had syncope preceded by severe precordial pain.

*Examination*—The patient, rather obese, extremely ill, was in shock and severe abdominal pain although the pupils were small from morphine. There was moderate cyanosis without ap-

preciable dyspnoea. Pulse was totally irregular, the radial vessels were thickened, the systolic blood pressure was 138. The abdomen was rounded, distended, and tympanitic, with diffuse tenderness and rebound pain. There was no localized or marked muscle spasm, there was moderate dullness in flanks, and moderate pitting edema of the lower extremities. T. 99.6, pulse 101, W. B. C. 22,400, 92 per cent PMN'S, urine, 1 plus albumen with hyaline and granular casts. Blood chemistry values, 20.15 urea nitrogen, .119 per cent blood sugar, 25 mg. creatinine per 100 cc. The clinical picture was that of advanced intestinal obstruction of less sudden onset than would be expected with valvulus or strangulation. In view of the cardio-vascular status with auricular fibrillation, marked peripheral arterio-sclerosis and suggestive coronary disease, a probable source of embolism from mural auricular thrombus was postulated. In view of the absence of evidence of malignant disease or other cause, mesenteric vascular occlusion was suggested as the most probable cause. Laparotomy was done; gangrenous bowel presented. Further procedure was contraindicated by the patient's extreme condition and death occurred soon after.

*Autopsy*—The heart weighed 700 grams. The coronary arteries were calcified and the left in its distal third was partly occluded. The abdomen contained 300 cc. of turbid fluid. The large and small intestine were distended and the entire ileum was congested and purple, and in four areas the wall was definitely gangrenous. The entire intestine was firmly knotted together with friable fibrinous exudate. The mesenteric artery and branches showed moderate thickening and sclerosis with thrombus of the greater part of this vessel and its branches. On section there was hyalinization and calcification with some loss of endothelium and thrombosis of recent origin definitely attached to the wall. The spleen showed one large infarct.

*Diagnosis*—Mesenteric thrombosis, hypertension, and marked arterio-sclerosis.

CASE NUMBER 68503. (Asbury Hospital). Male. Age 30. Married. Laborer. Patient was admitted to Asbury Hospital with the complaint of sharp severe pain in the right lower quadrant radiating to back and to left side of two weeks' duration. The pain was at first fleeting and gradually became more severe. He vomited nearly all food and for four days the emesis had been bloody. Stools were scant and dark. The pain became definitely intermittent and colicky in nature.

Appendectomy was done three years previously and cystoscopy one year later in the study for the cause of left sharp intermittent lumbar pain, without definite result.

*Examination*—T. 99.2, p.104. There was moderate prostration with quite agonizing intermittent abdominal pain. The abdomen showed that the spleen was palpable three fingers breadth before the costal margin. The leucocyte count was 13,200, and the urine contained a faint trace of albumin and occasional red blood cells and pus cells. Partial intestinal obstruction of undetermined etiology was thought to exist. The splenomegaly was not explained. Laparotomy was done by Dr. Webb; it was found that three feet of the ileum were dark; this portion was resected and mesenteric venous thrombosis was noted. Although signs of peritonitis did not develop, death occurred two days later.

*Autopsy*—showed thrombosis of mesenteric portal, and splenic veins with gangrene of the ileum, splenomegaly, and right hydrothorax (minimal). The pathological interpretation was possible thrombosis of a splenic vein with splenomegaly and secondary thrombosis of portal and mesenteric veins.

*In conclusion*—Two cases of intestinal obstruction due to mesenteric vascular occlusion are reported in one of which the pathological process ultimately found was recognized as probable before laparotomy. The cases reviewed in the literature tend to show that delay in operation rather than imperfect surgery has contributed to the high mortality rates. Keeping this condition in mind and thinking habitually in terms of pathological sequence may aid in more prompt intervention in cases of intestinal obstruction. This is particularly true in those cases in which the cardio-vascular status suggests a source of embolism or cause of thrombosis of the superior mesenteric vessels.

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## A Comparative Study of the Pirquet and Mantou Tuberculin Test with Some of Its Possibilities\*

S. A. SLATER, M.D., and W. P. ROSS, M.D.

*Worthington, Minn.*

THE value of the tuberculin test in the campaign against tuberculosis is becoming more and more appreciated. Until recently we were generally taught the percentage of children of school age reacting to the tuberculin test would be from seventy to ninety-five per cent. To show how erroneous the teaching may be I would like to quote from one of the latest (1931 Edition) and best books on internal medicine. "But over 90 per cent of those born within the past 25 years and now past childhood show evidence that they have been infected with the germs of tuberculosis. It has been found that about 10 per cent of all infants are infected during the first year of life and about 50 per cent before they reach six years and that at eighteen over 90 per cent of all human beings show unmistakable proof that they harbor tubercle bacilli within their bodies. The tubercle bacilli is ubiquitous and is sure to enter our bodies during early life." These figures were quoted without questioning the means by which they were obtained. Previous to 1925 most of the testing had been done in the tuberculosis clinics of the larger cities and on children who had been exposed to some member of the family suffering from the disease. Certainly under these conditions from eighty to ninety-five per cent would react. A different story is told when children of all classes are tested such as is done in schools. Much work has been done along this line recently and the number of positives have not been nearly as large as had been previously taught. The percentage reacting in the schools of rural Minnesota average about ten per cent; some of course showing a lower and some a higher percentage. Even the city schools give a percentage of only twenty to forty per cent, depending to a large extent upon the district in which it is located.

Previously to 1924 the VonPirquet had been the test commonly used. Since then the Mantou has been used more frequently on the ground that it was thought to be more sensitive. Feeling that the value of neither had been fully determined we decided to make a comparative study of the two tests under similar conditions. The work was

conducted in a wealthy rural community where living conditions are good, the people intelligent, very co-operative and the death rate from tuberculosis has been less than twenty-five per hundred thousand during the last five years. The test was taken to the schools because this was considered the best way to obtain a fair knowledge of existing conditions. Schools were selected so as to give the best representation possible of the district. A school from one of the largest towns was selected, several from the smaller towns, and a few which were strictly rural were included in the study. The majority of the pupils in every school took the test, and all who reacted were x-rayed and the plates interpreted by Dr. Leo G. Rigler, Chief of the X-Ray Department of the University of Minnesota. Every positive also received a physical examination of the chest, but the findings revealed so little of importance it is not recorded and was considered of practically no value. The history likewise was considered of very little value for some denied tuberculosis when it existed in the family, and others reported possible tuberculosis when it had not been present. Only personal acquaintance with the family gave information of value. Both tests were given at the same time, one on each forearm. The Pirquet was done by placing a drop of undiluted tuberculin on the forearm which had been cleansed with alcohol, and then with a scarifier a slight abrasion was made and it was allowed to dry.

This test should always have a control as an aid in interpreting the reaction, even though one has had considerable experience. The Mantou was made by introducing 0.1cc of 1-1000 dilution or 0.1 Mgm old tuberculin intracutaneously and the results of the two tests were read forty-eight hours later.

One thousand seven hundred and sixty-three white children were tested in this manner. (See table 1.) Of this number 220 or 12.4 per cent reacted to one or both tests. Sixty-six or 3.74 per cent reacted to the Mantou but not to the Pirquet. One hundred and two or 5.78 per cent reacted to both test. Fifty-two or 2.94 per cent reacted to the Pirquet but not to the Mantou. One hundred and sixty-eight or 9.5 per cent reacted to the

\*Presented before the staff of the Lymanhurst School for Tuberculous Children, March 22, 1932.

TABLE 1

Age	Mantoux and Pirquet			Total Positive	Total Negative	Total Tested	Percent Positive	Percentage Positive Of	
	Mantoux	Pirquet	Pirquet					Mantoux	Pirquet
6	3	7	7	17	160	177	9.6	5.6	7.9
7	5	7	2	14	125	139	10.0	8.6	6.4
8	3	7	5	15	118	133	11.2	7.5	9.0
9	1	6	5	12	135	147	8.1	4.7	7.4
10	4	2	10	16	129	145	10.3	4.1	9.3
11	3	6	2	11	126	137	8.0	6.4	5.8
12	1	6	0	7	114	121	5.7	5.7	4.9
13	6	11	7	24	102	126	19.0	13.4	14.2
14	4	8	4	16	139	155	10.3	7.7	7.7
15	13	11	3	27	133	160	16.8	15.0	8.7
16	10	11	4	25	122	147	17.0	14.2	10.2
17	6	7	2	15	72	87	17.2	14.9	10.3
18	7	13	1	21	68	89	21.3	20.2	15.7
Percent	3.74	5.78	2.94						
	9.52		8.62	220	1543	1763	12.4		
Average Age	13.3		11.3						
	13.0		12.2						

Mantoux and one hundred and fifty-four or 8.6 per cent reacted to the Pirquet.

A rather marked and interesting difference was shown in connection with the ages of those reacting to the two tests. The average age of those reacting to the Mantoux alone was 13.3, while the average of all those reacting (to the Mantoux) was 13 years. With the Pirquet the average of those reacting to this test alone was 11 years, while the average of all reacting (to the Pirquet) was 12.2 years. The reason the older students reacted to the Mantoux may have been due to the fact that this test being more sensitive gives a reaction when the pupil is older and has had a better opportunity for casual contact outside the home or has only a slight infection. Or the child may have overcome an old infection to the extent that it does not react to the less sensitive test, while those who reacted to the Pirquet possibly had become infected in the home or had recently been infected. Another explanation might be that the skin of the younger children is tender and more likely to react to the Pirquet than the thicker skin of the older child who reacts more readily to the Mantoux. If the former is true, the Pirquet would be more practical as an aid in discovering the source of infection. The value of this is readily seen, for we realize that if the infecting person can be removed the child has a better chance than would otherwise be possible. Results would indicate the Pirquet preferable in the younger child, while the Mantoux is preferable in the older. The Pirquet is also preferable in general practice, for it is simpler and easier to give; it avoids objection frequently encountered of having something injected into the child; and tuberculin undiluted will retain its potency indefinitely, while in the diluted form used in the Mantoux test the dilution should be freshly prepared; otherwise the test will be worthless.

On X-Ray examination of the first 134 positives (the x-ray examination of all reactors has not been completed) fifteen were found with demonstrable lesions, two reacted only to the Mantoux test, twelve to both tests and one to the Pirquet only.

The number tested, 846 boys, of whom 111 or 13.1 per cent reacted to one or both tests, and 917 girls of whom 109 or 10.7 per cent reacted to one or both tests. In a previous study of 1006 children tested and which is included in this paper of 1763 there was a higher percentage of reactors among the girls, 14.2 per cent than boys, 12.4 per cent. Just why the percentage of reactors should be so much higher among the boys than girls in the last seven hundred and fifty-seven is rather difficult to explain. The latter group was not as representative as the former for it was from larger schools. There was, however, a marked difference found in one of the largest schools studied. This one had the highest percentage (23.1 per cent) of any tested. The boys being 33 per cent, the girls, 12.9 per cent. The remaining schools showed the boys and girls about equal.

One school in which four hundred and seventy-six children were tested; two hundred and fifty-seven being from six to twelve years of age, and two hundred nineteen being from twelve to eighteen years of age. In the younger group twenty-two reacted to one or both tests; eighteen to the Pirquet and twelve to the Mantoux. Ten reacted to the Pirquet and not to the Mantoux and four reacted to the Mantoux and not to the Pirquet. In the older group of two hundred and nineteen, twenty-six reacted to one or both tests. Eleven reacted to the Mantoux who did not react to the Pirquet, while only one reacted to the Pirquet who did not react to the Mantoux. While this is a rather small number from which to draw

conclusions it would seem that the younger child is more likely to react to the Pirquet while the older is more prone to react to the Mantou. Studies of this nature serve to make the work interesting as well as valuable.

Of the total number reacting, seventy-three girls reacted to the Mantou and seventy-three to the Pirquet, while eighty-nine boys reacted to the Mantou and seventy-four to the Pirquet. The number reacting to each test was the same in the case of the girls while the difference was quite marked among the boys. This is rather interesting and would suggest a home infection in the girls and as a result a likelihood to react to the less sensitive as well as the other test. In the case of the boys, a greater number probably became infected outside the home as a result of casual exposure, consequently they reacted more frequently to the more sensitive test.

It is interesting to note that without any special effort or follow up in at least 50 per cent of those children reacting the source of infection was known. It is reasonable to feel that with an intensive follow up of the children reacting the source of infection could be found in a high percentage of cases. The follow up of the infected child would offer the best possible means of discovering the adult case, frequently at a time when the greatest good could be rendered and long before it would be found otherwise. Certainly children coming from homes where there are open cases of tuberculosis should be carefully studied. The adults in the home of a child reacting to the tuberculin test should likewise be studied to find the source of infection. This would give one an opportunity to find the adult case in time to save him and protect others from further infection. By means of the tuberculin test the infected child may be found in time to prevent the development of clinical tuberculosis later in life.

A study of children coming from families where there are known cases of open tuberculosis is interesting. (See table 2.) Thirty-eight families were studied and the total number of chil-

dren examined was one hundred and seventeen of which one hundred and two reacted to one or both tests, six to the Mantou and not to the Pirquet and three to the Pirquet but not to the Mantou. Those who did not react to either test are worthy of comment, as well as those who reacted to one test and not the other. Even though the number tested was not large, I believe it is significant that such a high percentage reacted. When a child has had a family exposure it would appear that either test will most likely give a reaction. It seems that when the percentage reacting is so small, as is the case in a district such as has been studied, it would be well worthwhile to use the tuberculin test more widely in the schools and make a family study of all children reacting as a means of discovering adult cases.

The tuberculin test may also be used as a means of helping to clear up some cases of doubtful diagnosis in which tuberculosis is suspected. If there are children in the home of a suspected case of tuberculosis in which it is impossible to make a definite diagnosis and they are tested and found infected with tuberculosis, it would be fairly conclusive evidence the patient had tuberculosis. If they reacted negatively the evidence would be against tuberculosis. In one family in which the children were tested and the source of infection could not be discovered the father had the cattle tested and found several reactors among the herd. Naturally he regretted he had not had the cattle tested earlier.

More of value with further study may be learned as an aid in prognosis. It is reasonable to feel that the value of the tuberculin test is only beginning to be appreciated. With its continued use it will not only be found of great value in discovering the infected case, the source of infection, but also the type of case most likely to develop clinical tuberculosis later in life. It will certainly take its place among the most valuable agents we have in combating tuberculosis. It is hoped that further study may reveal its real and full value.

TABLE 2

Group	Group of Children from Number Tested	Homes Where There Has Been Exposure to Open Cases of Tuberculosis			Remarks
		Mantoux Positive	Pirquet Positive	Negative	
1	68	68	68	0	
2	6	3	6	0	
3	9	9	7	0	
4	22	9	9	13	Source of infection sister; four brothers, one sister negative; three sisters positive.
5	3	2	2	1	Source removed from home when negative; was only two weeks old.
6	5	4	4	1	Mother had tuberculosis. Negative; removed at birth.
7	4	4	0	0	Children 15, 16, 17, 18 years old. Source removed from home when children were young.
Total	117	99	96	15	
Percent	100	84.6	82	12.8	102 or 87.2%
38 Families					

## Marked Secondary Anemia with Hemorrhoids

HARRY F. BAYARD, M.D.

*Minneapolis*

**H**EMORRHOIDS are frequently associated with mild or moderate degrees of secondary anemia and occasionally with a type of anemia which is very difficult to release from the suspicion of being the primary or pernicious type. I have at times seen cases in which the presence of slight amounts of hydrochloric acid was the only decisive factor in favor of a secondary type. Frequently a right colon malignancy must be ruled from the picture before one can ascribe the anemia to hemorrhoids.

It is difficult to attribute these severe grades of anemia to hemorrhoids when no accurate idea of the amount of blood lost can be ascertained. Patients will mention the bleeding but frequently they are very vague as to how much blood was actually lost and in the presence of a vague description, doubt is entertained as to the origin of the anemia.

In addition to the actual bleeding a factor in the anemia may be ulceration of internal hemorrhoids and thrombo-phlebitis in the hemorrhoidal veins. These lesions which sometimes last for prolonged periods are very painful and seem to reduce the well being of the patient a great deal. Hemorrhoids of this type should be removed surgically of course, but even after this procedure the rise in hemoglobin is quite slow so that additional therapy must be directed to this end for several months at a time.

In contrast to this group with the ulcerating or thrombotic areas there exists another group with pronounced anemia which present smaller internal hemorrhoids which, in spite of being smaller, bleed frequently and profusely. It is only by examination with a suitable speculum and light that this type may be specifically loaded with the blame for an existing anemia. Uncomplicated internal hemorrhoids may seldom be felt by the finger in doing a digital examination.

This latter group presents the type of lesion which is most amenable to treatment by injection of sclerosing fluid. They must be free of external hemorrhoids and not exhibiting much prolapse. Provided these restrictions are observed, this group offers the most satisfactory class of patients to treat of any group with which I am familiar.

In the history and physical findings I am pre-

sented, a case of the first group is represented. This patient had a most profound anemia of a very slowly regenerating type which required months of subsequent treatment to reach a satisfactory hemoglobin level. I have seldom seen as extensive hemorrhoidal disease as this patient presented.

*History*—The patient is a white male of forty-seven years who lives at home with his family. His occupation is sedentary. His past history includes influenzal pneumonia in 1922 and persistently recurring short periods of constipation for the past ten years. Twelve years ago he had an hemorrhoidectomy done but before a year had passed he was again bothered by more hemorrhoids. His present complaint is bleeding hemorrhoids and weakness. Since the present acute attack he has difficulty voiding and a marked vesicle retention was found on physical examination. Exertion would make him dizzy and accentuate the weakness; his trouble has been growing worse for the past eleven years.

*Physical Examination*—Weight 134 pounds, blood pressure, systolic, 118 and diastolic 62. Pulse 88—temperature 100.4—under nourished, markedly anemic male—soft murmur at the base of the heart with an accentuated pulmonic second sound. Abdomen negative. Rectum—Internal and external hemorrhoids with thrombosis present and a great deal of protrusion.

*Laboratory Findings*—Urinalysis: Single specimen 300 c.c., S.G. 1018—reaction acid—albumin 2—sugar 0—pus 1—(6 cells)—Blood Count: Hemoglobin 34 per cent—Red cell count 2,130,000—White cell count 6200—color index .89—blood group IV. Wasserman: Negative. Gastric Analysis: Total Acidity 65.0—free HCl 45—quantity 30.00 c.c.—food 0—blood 0—mucous 2—Differential Blood Count: White count—6200—Lymphocytes .5 large mono. 2.5—transitionals 3.5—neutrophils 65.0—eosinophils 2.5—moderate anisocytosis and poikilocytosis—slight polychromatophilia—bleeding time 3 minutes—cells look like a very severe infection but there is not the immaturity present for a leukemia. Blood Cultures: Negative on all media—X-ray reports: Stomach, chest and colon negative.

*(Continued on Page 483)*

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### HOT WEATHER SUGGESTIONS

At this time of the year everyone is concerned with "how to keep cool" and the doctor should be prepared to give a few simple understandable hints along this line.

We may tell them that fretting does not help; rushing always overheats. Keep your mind on your work and not on the weather. Avoid the direct rays of the sun when it is high. Take frequent baths. Dress lightly and in light colors. Avoid fried foods; they are fatty and fat produces body heat. Park the frying pan for the summer. Eat plenty of green leafy vegetables and fruits, and drink milk in preference to all iced drinks. More frequent use of ice cream and fruits for daily desserts are to be recommended.

Avoid hurry and worry. Relax for a few minutes during the heat of the day and build up your resistance. Take your time in gradually collecting a coat of tan and resolve by these various means to be comfortable.

### POCKETS, LARGE AND SMALL

It is said that dear old "Uncle Allen" who graced the chair of the practice of medicine at Rush about sixty years ago, used to recommend to those graduating, the need of two pockets—"a small one for fees and a large one for insults."

Perhaps he was right, and now and then, even

at present, it would appear that such advice were quite ap-ro-pos. But why, of all times, bring this up now, when the stress of economic conditions makes it so keenly felt?

It is not to increase the poignancy of the blow; neither add anxiety, nor yet irritability, (which is a biproduct of anxiety) to the afflictions of those who are distressed by financial cares and worries. It is rather to paint a different picture, show another side, and perhaps point the way, at a time when this should not be lost sight of, to a better source of comfort and happiness than that of dollar and cents.

Ours is an altruistic profession. We chose it as a career because it appealed to us as furnishing an opportunity to do the most worth while thing in life; to serve unselfishly and with self-sacrificing devotion our fellowmen, afflicted with misfortune, disease and suffering. How much better it feels to give them to avariciously receive and hoard.

At the end of the journey, all the gold of the Yukon and all of the jewels and wealth of the Indies can never measure up to the comfort and satisfaction experienced, in contemplation of work well done, in the memory of a life well spent, lived with useful purpose and dedicated to the promotion of helpfulness and happiness among the needy and distressed.

Let us be covetous, but let us cherish the possession of ideals rather than money. After all, is it not better to have harder times and nicer people than the reverse? We belong to a profession that should know, and we feel sure that the ayes have it.

A. E. H.

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 J. W. ANDREWS, M.D.

The passing of a pioneer is a matter for note. From a man who had attained the age of 83, and had practiced medicine for 55 years, keeping it to the last an active interest in his profession and in the life of his community, we may draw something worthy of record, though it be necessarily brief.

The period of his career as a physician covered the fifty-five years just passed, during which there has been the greatest evolution in the history of medicine, not only because of the rapid advances in scientific thought and practice, but because of the more recent economic evolution underway. A columnist, in the Mankato Free Press, puts into words the thought of the community when he says, "*He was an outstanding, recognized physician and surgeon it is true, a student of his profession. He was among those veteran physicians who saw medical practice change from the general practitioner who cared for all manner of cases to the highly specialized age of the clinic and laboratory which we have today. And throughout his years he kept abreast of all this progress, keenly interested, alert to every advance and forward step. Periodically he visited the advanced medical schools to renew and refresh his learning. The number in the community is legion who owe their health and strength to his skill and attention, to his patience and kindly ministrations. But it is to his service as a citizen rather than as a physician that the community owes a particular debt of gratitude. He rose above his profession, so to speak. He was a man before he was a physician.*"

A glimpse of what the influence of such a man may be is obtained through an incident quite early in his career. In a blizzard the legs of Michael Dowling were frozen so severely that amputation was finally necessary. In a roadside cottage, by the light of lanterns, Dr. Andrews performed this operation. How Michael Dowling overcame his handicap, and in addition became the greatest friend of crippled children, is known the country over.

John Wesley Andrews was born in Illinois, April 6, 1849. He died at his home in Mankato, May 16, 1932. He was the fourth of ten children of Rev. John R. and Delilah Andrews.

His father was a Methodist minister and in the fall of 1856 moved with his family to Minnesota and settled near St. Peter. During the

panic of 1857 the family underwent many privations and the necessities of life were at times secured only through the gathering and sale of ginseng roots abundant near their home. His first schooling was in St. Peter and at 19 years of age he became a student in the Old Normal School at Mankato but his course here was interrupted by an attack of typhoid fever. He then taught in the high school at St. Peter for three years. His formal studies in medicine began at the University of Michigan and were continued at Rush Medical College in Chicago, until 1877 when he received the degree, Doctor of Medicine.

After two years of practice Dr. Andrews went to New York and studied in the Bellevue Hospital Medical College, receiving a diploma in 1880. He went to Mankato in 1885. Thus he practiced medicine for fifty-five years, forty-seven of them in Mankato. In 1886 he studied in the hospitals of Berlin and Vienna and from that time on kept in touch with all the developments of medicine by study at frequent intervals in leading centers of this country.

Both Dr. Andrews, and his son, Roy, were charter members of the Mankato Clinic, organized in 1916. He retired from the clinic in 1923 but maintained an office there and continued to practice until his last trip to Florida, the past winter. He served for one year as President of the Minnesota Valley Medical Association and later as President of the Minnesota State Medical Association, and was a Fellow of the American College of Surgeons. He served four consecutive years as Worshipful Master of Mankato Lodge, A.F. & A.M., and was a member of the Commandery and Osman Temple of the Mystic Shrine.

In April, 1907, he was elected Mayor of Mankato and served one term. In November, 1914, he was elected to the State Senate from Blue Earth County and served until 1918.

The writer of this sketch had an opportunity to see this fine physician and noble man during some of the later weeks of his life when the character of his final illness was apparent. His clear mind, interest in and understanding of every detail of his malady, his calm courage and his unflinching faith, together with the life of service he had lived throughout constitute an example not readily forgotten.

S. M. W.

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CAT.

## NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Dr. J. S. Tschetter, Huron, has been appointed county physician of Beadle Co., S. D.

Dr. B. A. Weis, formerly of St. Paul, has joined the staff of the Bartron Hospital of Watertown, S. D.

Dr. H. A. Vogel, a recent graduate of the University of Minnesota, has decided to locate at New Ulm, Minn.

Dr. C. C. Hoagland, Madison, S. D., has disposed of his practice and will retire from active work, owing to ill health.

Dr. H. S. Holmes, White Sulphur Springs, has moved to Harlowton, Mont., and opened offices for general practice.

Dr. Wilson Lancaster, who has been in active practice at Wahpeton, N. D., for many years, is now located at Adams, Wis.

The Mobridge, S. D. Clinic, has moved into new and greatly enlarged offices, giving both Drs. Twining and Sarchet, private offices.

Dr. Oren L. Kirklin, Rochester, Minn., was recently married to Miss Eleanor, daughter of Dr. and Mrs. E. S. Judd of that city.

Dr. W. H. Phillips, Jordan, Minn., has taken in a young partner, Dr. E. L. Lighbourn, a graduate of the University of Minn., of the 1930 class.

Dr. B. Scodel, formerly of Big Falls, Minn., has moved to Upsala, being the first resident physician to locate in that village for many years.

Dr. A. E. Hedback, Minneapolis, is on a motor trip to the Olympic games in Los Angeles with members of his family, sightseeing on the way.

Dr. A. D. Brewer, Boseman, has been elected president of the Montana Public Health Association, at the annual meeting held at Miles City last month.

The annual meeting of the Upper Mississippi Medical Society was held at International Falls, Minn., last month, with a large number of members being present.

Dr. Henry E. Michelson, Minneapolis, presented three papers before the Annual Meeting

of the Northwest Medical Society, held recently at Spokane, Washington.

Dr. John P. Kenny of Butte, Mont., who has been studying orthopedics with Dr. Louis W. Allard, was stricken at a mountain camp near Red Lodge and died while being brought to that city.

Dr. John L. Everlof, who has practiced medicine in Minneapolis during the past 12 years, died at his home on July 12th, at the age of 44 years. Dr. Everlof was on the staff of the General and Swedish Hospitals.

The gold medal presented each year by the Southern Minnesota Medical Association for the best scientific exhibit at the state medical meeting was awarded to Dr. L. A. Buie of Rochester for his exhibit entitled "Proctology: Diagnostic and Surgical."

Dr. Thomas K. Moen, Minneapolis, has been appointed to the staff of the Rockefeller Institute. Dr. Moen will be engaged in the investigation of acute rheumatic fever, with Dr. Homer Swift. For the last three years he has been assistant in the University Hospital.

Doctors from the Sioux Falls Medical Society stepped into the breach when the tornado broke, canvassed stricken areas in the path of the storm and lent relief where it was needed. They were constantly on duty day and night, ready to step in and fill any emergency calls.

Miss Kathrynè M. Radebaugh, executive secretary of the Hennepin County Tuberculosis association, was elected president of the National Conference of Tuberculosis Secretaries at the recent convention of the National Tuberculosis association at Colorado Springs, Colo.

Wabasha will be the next meeting place of the Wabasha County Medical society, the oldest county medical group in Minnesota. Officers are: Dr. W. B. Stryker, Plainview, elected president; Dr. R. C. Radebaugh, Hastings, vice president and Dr. W. F. Wilson, Lake City, secretary-treasurer.

Dr. Edward C. Emerson, St. Paul, was recently elected secretary of the American Medical Association chapter in Budapest. Dr. Emerson left last March to study in the clinic of Dr. Polya, noted European surgeon. Following the attendance of other clinics in Vienna, Paris, and London, Dr. Emerson will return to St Paul during August.

Dr. Sidney Watson, aged 27, died at his home at Worthington, Minn., after a brief illness of septic sore throat and heart trouble. He was a graduate of Worthington high school and the University of Minnesota medical school. He was a member of the staff of the Worthington clinic, to which his father, the late Dr. F. G. Watson, belonged.

Dr. B. L. Pampel, of Livingston, was elected president of the Montana Medical association for 1933 and Anaconda was chosen for next year's meeting. Dr. J. R. E. Sievers, of Butte, assumes the duties of president for the remainder of this year. Other officers are: Dr. J. A. Evert, Glendive, vice president; Dr. E. G. Balsam, Billings, secretary; Drs. L. H. Fligman, Helena, J. H. Garberson, Miles City; A. W. Morse, Butte; A. M. Treat, Fairview, and E. D. Hitchcock, Great Falls, councilors.

A fine of \$200 was imposed on Fred Ziegler, Elmore, for practicing healing without a basic science certificate. Ziegler, who claims to be a naturopath, has been making his living by bleeding and cupping patients, the state board of medical examiners reports. He informed the court that he had an eighth grade education in Germany but has no medical education, except that he holds a degree of "doctor of naturopathy" obtained at a school in Minneapolis. Ziegler was fined \$500, June 11, 1930, at New Ulm, for practicing without a license.

The Minnesota State Medical association broadcasts weekly at 11:15 o'clock every Wednesday morning over station WCCO, Minneapolis and St. Paul (810 kilocycles or 372.0 meters). *SPEAKER*—William A. O'Brien, M.D., associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month of August will be as follows: August 3rd, Signs of Heart Disease; August 10th, Poison Ivy; August 17th, Getting Ready for School; August 24th, Pyelitis in Children, and August 31st, Ulcer and Cancer of the Stomach.

Norman Baker, who lost his license to operate KTNT, at Shenandoah, Iowa, in a tussle with the Federal Radio Commission, is now building a 150,000-watt station at Nuevo Laredo, Mexico. One of the main uses of the new transmitter, which will be the most powerful in operation on this continent, will be to promote the candidacy of Baker, who is running for Governor of Iowa on

an independent ticket. Baker is the second United States citizen to set up a broadcasting plant below the Rio Grande after having been denied use of the air in this country. The other was Dr. J. R. Brinkley from Milford, Kansas, who now operates XER at Villa Acuna, Mexico.

James J. Carrigan, St. Paul, entered a plea of guilty to a charge of practicing healing without a Basic Science Certificate. The defendant, who claims to be a chiropractor and a naturopath, and who formerly practiced in Alberta, Canada, attempted to treat one, Josephine Shanoha, St. Paul, who is afflicted with a mental and nervous disorder. In addition to giving the patient some message treatments, defendant sold her a magnacoil electric blanket for \$10.00, and a rupture appliance for \$12.00. The defendant has no medical education whatsoever and upon being questioned by the Court stated that he left school at the age of sixteen. The Court sentenced Carrigan to ninety days in the St. Paul Work-house, which sentence was stayed for one year and the defendant placed on probation, conditioned that he absolutely refrain from practicing healing and from selling any devices or remedies for the curing of ailments.

#### MARKED SECONDARY ANEMIA WITH HEMORRHOIDS

(Continued from Page 476)

*Prooperative Diagnosis*—Thrombosed Internal and External Hemorrhoids.

*Operation*—An amputative type of hemorrhoidectomy was done removing three areas and attaching the skin margin, which was cut long, to the mucosa in such a way that the suture line was at the point of the former muco-cutaneous junction. There was extensive thrombosis present throughout a great deal of the amputated tissue.

*Progress Notes*—The patient developed a moderate reaction after the operation but was very weak and showed only mild regeneration in his R.B.C. The hemoglobin, which before operation was 34 per cent (Dare), gradually ascended to 60 per cent during the course of four months following two transfusions of 450.0 c.c. whole blood. After another three months his hemoglobin reached 82 per cent. During this period of convalescence he was taking a mixture of iron citrate daily and at the end of the period showed a normal differential count. There has been no more blood in the stool, either gross or occult.

LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD  
OF MEDICAL EXAMINERS, JUNE 30, 1932

BY EXAMINATION

(June)

Name	School of Graduation	Address
Beecham, Clayton Tremam . . . . .	U. of Minn., M.B., 1932 . . . . .	University Hospital, Minneapolis, Minn.
Bolender, Harold Leland . . . . .	U. of Iowa, M.D., 1930 . . . . .	929 Selby Ave., St. Paul, Minn.
Bouquet, Bertram Jacob . . . . .	Washington U., M.D., 1931 . . . . .	Caledonia, Minn.
Buckley, Clarence Harold . . . . .	U. of Minn., M.B., 1932 . . . . .	Eitel Hospital, Minneapolis, Minn.
Bunker, Bevan William . . . . .	U. of Minn., M.B., 1932 . . . . .	Rothsday, Minn.
Corwin, Warren Coons . . . . .	Johns Hopkins, M.D., 1932 . . . . .	1625 W. 25th St., Minneapolis, Minn.
Fitzgerald, Edward Michael . . . . .	U. of Minn., M.B., 1931, M.D., 1932 . . . . .	525 11th Ave. S. E., Minneapolis, Minn.
Foster, Robert Francis . . . . .	Northwestern, M.B., 1929, M.D., 1930 . . . . .	603 1st Ave. S. W., Rochester, Minn.
Gilpin, Sherman Fulmer, Jr. . . . .	U. of Pa., M.D., 1929 . . . . .	Mayo Clinic, Rochester, Minn.
Grand, Clifford August . . . . .	U. of Minn., M.B., 1931 . . . . .	St. Luke's Hospital, Duluth, Minn.
Haven, Walter Kirkland . . . . .	U. of Minn., M.B., 1931, M.D., 1932 . . . . .	151 Malcolm Ave. S. E., Minneapolis, Minn.
Henry, Clarence John . . . . .	U. of Minn., M.B., 1932 . . . . .	Foley, Minn.
Hill, Elmer Morris . . . . .	U. of Minn., M.B., 1931 . . . . .	Mpls. Gen. Hosp., Minneapolis, Minn.
Hoffman, Malcolm Edwin . . . . .	U. of Minn., M.B., 1930, M.D., 1932 . . . . .	588 Portland Ave., St. Paul, Minn.
Hospodarsky, Leonard John . . . . .	U. of Iowa, M.D., 1931 . . . . .	New Prague, Minn.
Hoyer, Ludolf Julius . . . . .	U. of Minn., M.B., 1932 . . . . .	2308 Logan Ave. N., Minneapolis, Minn.
Ivers, George Urben . . . . .	Rush Med. Col., M.D., 1932 . . . . .	Christine, N. Dak.
Johnson, Raymond Gregor . . . . .	U. of Minn., M.B., 1931, M.D., 1932 . . . . .	123 7th St., Cloquet, Minn.
Kass, Isadore Harris . . . . .	U. of Mich., M.D., 1929 . . . . .	St. Mary's Hospital, Rochester, Minn.
Knutson, Gerald Arthur . . . . .	Northwestern, M.B., 1931, M.D., 1932 . . . . .	Buxton, N. Dak.
Kroning, Carl Gustav . . . . .	U. of Minn., M.B., 1932 . . . . .	St. Mary's Hospital, Duluth, Minn.
Marble, Willard Pearl . . . . .	U. of Iowa, M.D., 1929 . . . . .	1238 Second St. N. W., Rochester, Minn.
Nelson, O. L. Norman . . . . .	U. of Minn., M.B., 1931, M.D., 1932 . . . . .	Mpls. Gen. Hosp., Minneapolis, Minn.
Rasmussen, Ruth Frances . . . . .	U. of Minn., M.B., 1931, M.D., 1932 . . . . .	111 4th Ave. N. W., Rochester, Minn.
Ryan, George Harold . . . . .	U. of Manitoba, M.D., 1929 . . . . .	Mayo Clinic, Rochester, Minn.
Schmidtke, Reinhardt Ludwig . . . . .	U. of Minn., M.B., 1932 . . . . .	Receiving Hospital, Detroit, Mich.
Schwegler, Raymond Allen . . . . .	U. of Minn., M.B., 1930, M.D., 1931 . . . . .	329 Union St. S. E., Minneapolis, Minn.
Thomson, James Myron . . . . .	U. of Minn., M.B., 1931 . . . . .	Mpls. Gen. Hosp., Minneapolis, Minn.
Thoreson, M. C. Bernice . . . . .	U. of Minn., M.B., 1931, M.D., 1932 . . . . .	888 Grand Ave., Apt. 304, St. Paul, Minn.
Waligora, Daniel John . . . . .	U. of Minn., M.B., 1932 . . . . .	St. Mary's Hospital, Minneapolis, Minn.
Walker, Arthur Edgar . . . . .	Marquette, M.D., 1932 . . . . .	1833 Vermillion Rd., Duluth, Minn.
Watterson, Gerald Treslar . . . . .	Indiana U., M.D., 1932 . . . . .	St. Luke's Hospital, Duluth, Minn.

BY RECIPROACITY

Bryant, Frank Leytze . . . . .	Jefferson Med. Col., M.D., 1927 . . . . .	3014 Hennepin Ave., Minneapolis, Minn.
Hand, Orra Robert . . . . .	Washington U., M.D., 1930 . . . . .	3026 W. Lake St., Minneapolis, Minn.
Jordan, Donald Voorhees . . . . .	U. of Ill., M.D., 1928 . . . . .	126 Oak Grove St., Minneapolis, Minn.
Murphy, Edward S. . . . .	Creighton U., M.D., 1916 . . . . .	University Hospital, Minneapolis, Minn.
Weiss, Leo Heinrich . . . . .	U. of Tubingen, Germany, Scientific Degree, Dr. of Med., 1927, Univ. of Gottingen, 1924 . . . . .	Le Center, Minn.

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Literature will gladly be supplied by the office at Waukesha, Wis.

### THE DOCTOR AND THE STATE FAIR

A State Fair is a form of civic advancement that deserves the encouragement of every physician, and we cordially recommend to our readers that they speak a good word this year for their respective fairs, encouraging parents and children to attend these splendid opportunities of getting together by country and city people who are mutually interested in the activities of each other. Minnesota and the Dakotas will especially have great exhibits this year; and the managers of these gatherings will appreciate, more fully perhaps than medical men realize, the co-operation of physicians whose influence in such direction is potent. The Minnesota State Fair will open on September 3rd, and continue through each day and evening until the 10th.

### COMMERCIALISM VERSUS PROFESSIONALISM

We do not know whether this title is fairly descriptive of the idea we are endeavoring to express here. Our observation is that for many years the profession of Pharmacy has experienced much travail in its effort to remain a profession. Its necessarily close association with the commercial enterprise known as "the drug store," or "the pharmacy," or what not, principally the first named, has presented complications diffi-

cult, if not impossible, to overcome. What has happened is familiar to most of our readers. That is another story.

Some years ago, manufacturers of pharmaceuticals stumbled into this same boghole, from which it has been partially excavated by the medical profession, through the Council on Pharmacy and Chemistry of the American Medical Association. That is also another story, and an interesting one.

One of the large manufacturers of a product extensively prescribed by practicing physicians, and extensively used for that reason, was, it seems, told by the representative of a powerful drug chain organization that it must make certain concessions to "modern merchandizing methods," or else—. The first thing wanted was an extra discount. This was needed in order that the products in question might be advertised to the public. The answer of the manufacturer was that he did not desire to advertise his products to the public. He prided himself that he advertised only to the medical profession. He felt that the public had no business prescribing for itself, even such a good product as he made.

The manufacturer refused to accede, and the chain-store concern threatened to break the manufacturer and, we are told, an effort is being made to make good the threat. An edict has gone to all clerks to dispense the product of another manufacturer. In none of this large number of drug stores may the product of this manufacturer be had except definitely named in the prescription of a physician.

We hope we have made the case clear. It is a difficult story to tell in a few words.

We are interested because this appears to be one of the many instances where the practicing physician is supposed to let others do their thinking for them. It seems to be true that commercial interests, because their affairs are dealt with in terms of money, should prevail over purely professional interests. The professional man emphasizes service rather than money, which, in the eyes of the financial magnate, is fatal. This is true not only in the manufacturing game, but in every other phase of finance touched by the professional man, particularly the physician.

We need only to look around a bit to identify any number of schemes whereby the doctor may be circumvented. Most all of the popular remedies, proprietary foods, and the like, have been popularized by the medical profession. Generally the doctor tells his patient to get some of this, that or the other drug or food, and take it. The patient goes ahead and, having followed the advice of the doctor that far, does not hesitate to follow the later and more intimately given advice of a clerk in a drug store. And the doctor stands for it. And generally the manufacturer stands for it. And why should the manufacturer be troubled when the doctor is not? The truth of the whole business is that not all doctors agree to the idea, and we know of a few instances in which the manufacturer chooses to lose materially by holding to the same ethical standards.

It seems that the medical profession is going to be driven to prescribe products by proprietary name, or at least give the name of the manufacturer, if they

# THE JOURNAL-LANCET

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**Minnesota, North Dakota, South Dakota, and Montana**  
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**North Dakota and South Dakota State Medical Associations**

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TRANSACTIONS OF THE SOUTH DAKOTA STATE MEDICAL ASSOCIATION  
FIFTY-FIRST ANNUAL SESSION—1932  
WATERTOWN, S. D.

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#### SOUTH DAKOTA STATE MEDICAL ASSOCIATION

#### STANDING COMMITTEES

##### CHAPTER VII, SECTION 2

##### SCIENTIFIC WORK

J. B. GREGG, M.D., 1933.....Sioux Falls

B. H. SPRAGUE, M.D., 1934.....Los Angeles

J. F. D. COOK, M.D. ....Langford

##### PUBLIC POLICY AND LEGISLATION

##### SECTION 3

J. R. WESTABY, M.D., President.....Madison

E. W. JONES, M.D., President-elect.....Mitchell

##### THE COUNCIL

##### PUBLICATIONS

##### SECTIONS 4 AND 6

##### THE COUNCIL

##### MEDICAL DEFENSE

T. F. RIGGS, M.D., 1933, Chairman.....Pierre

S. M. HOHF, M.D., 1934.....Yankton

J. D. WHITESIDE, M.D., 1935.....Aberdeen

##### MEDICAL EDUCATION AND HOSPITALS

##### SECTION 6

J. C. OHLMACHER, M.D., 1935, Chairman, Vermilion

H. T. KENNEY, M.D., 1933.....Watertown

N. T. OWEN, M.D., 1934.....Rapid City

##### MEDICAL ECONOMICS

##### SECTION 7

H. W. SHERWOOD, M.D., 1933, Chairman....Doland

J. M. WALSH, M.D., 1934.....Rapid City

D. S. BAUGHMAN, M.D., 1935.....Madison

**HYGIENE**

E. A. PITTENGER, M.D., 1933, Chairman...Aberdeen  
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 W. E. DONAHUE, M.D., 1935.....Sioux Falls

**CANCER**

W. R. BALL, M.D., 1933, Chairman.....Mitchell  
 J. D. WHITESIDE, M.D., 1934.....Aberdeen  
 N. J. NESSA, M.D., 1935.....Sioux Falls

**NECROLOGY**

J. B. VAUGH, M.D., 1933, Chairman.....Castlewood  
 L. J. PANKOW, M.D., 1934.....Sioux Falls  
 THOS. CRUICKSHANK, M.D., 1935.....Vermilion

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S. M. HOHF, M.D., 1933.....Yankton  
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**HOUSE OF DELEGATES**

The first meeting of the House of Delegates of the Fifty-First Annual Session of the South Dakota State Medical Association, held in Watertown, South Dakota, June 20-22, 1932, convened on Monday Afternoon, June 20, at 2:40 o'clock in the Hotel Lincoln, the President of the Association, Dr. W. A. Bates, of Aberdeen, presiding.

There were present:

**DELEGATES**

Aberdeen District No. 1.  
 E. A. Pittenger, M.D.....Aberdeen  
 J. D. Whiteside, M.D.....Aberdeen  
 Watertown District No. 2  
 A. Einar Johnson, M.D.....Watertown  
 Madison District No. 3  
 D. S. Baughman, M.D.....Madison

Pierre District No. 4  
 B. M. Hart, M.D.....Onida  
 Huron District No. 5  
 H. D. Sewell, M.D.....Huron  
 Sioux Falls District No. 7  
 L. J. Pankow, M.D.....Sioux Falls  
 Yankton District No. 8  
 S. M. Hohf, M.D.....Yankton  
 Thomas Cruickshank, M.D.....Vermilion  
 Black Hills District No. 9  
 J. L. Stewart, M.D.....Nemo  
 Rosebud District No. 10  
 S. J. Walters, M.D.....Winner  
 Kingsbury District No. 11  
 \*A. E. Bostrom, M.D.....DeSmet  
 \*A. E. Bostrom seated by the House of Delegates until the regularly constituted Delegate should arrive.

**OFFICERS**

W. A. Bates, M.D., President.....Aberdeen  
 E. W. Jones, M.D., Vice-President...Madison  
 J. F. D. Cook, M.D., Secretary-Treasurer.....Langford

**COUNCILORS**

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 H. W. Sherwood, M.D.....Doland  
 Third District  
 C. E. Sherwood, M.D.....Madison  
 Fifth District  
 E. B. Taylor, M.D.....Huron  
 Seventh District  
 A. S. Rider, M.D.....Flandreau  
 Tenth District  
 H. R. Kenaston, M.D.....Bonesteel  
 Eleventh District  
 A. E. Bostrom, M.D.....DeSmet  
 Councilor at Large  
 Percy D. Peabody, M.D.....Webster

The Secretary offered the following correction to the minutes of the previous meeting as printed in the August 15, 1931, issue of the JOURNAL-LANCET: total amount on hand should be \$2,247.-22 instead of \$2,287.22, and moved the adoption of the minutes as corrected. The motion was regularly seconded and carried.

Dr. J. F. D. Cook presented the following report as Secretary:

## REPORT OF SECRETARY TO THE HOUSE OF DELEGATES

The office has carried on the correspondence of the Association which has been exceptionally heavy due to preparation of Basic Science Law material.

Your secretary has visited the following District Medical Societies with the President, W. A. Bates, M.D.: Huron, Yankton, Kingsbury, Whetstone Valley, Aberdeen and Watertown. President W. A. Bates has further visited Black Hills and Pierre Districts. Because of conflicts and road conditions, it was impossible to visit the other Districts.

The secretary attended the Northwest Regional Conference, January 24, 1932, at the Saint Paul Hotel, St. Paul. Those present were:

Mr. Vernon Blank, Des Moines, Iowa, Managing Director, Iowa State Medical Society.

Dr. W. F. Braasch, Rochester, Minn.

Dr. Earl Whedon, Sheridan, Wyoming, Secretary, Wyoming State Medical Society.

Mr. J. G. Crownhart, Madison, Wis., Secretary, Wisconsin State Medical Society.

Dr. S. H. Boyer, Duluth, Minn.

Dr. Otho A. Fiedler, Sheboygan, Wis., President, Wisconsin State Medical Society.

Dr. H. M. Camp, Monmouth, Ill., Secretary, Illinois State Medical Society.

Dr. R. W. Fouts, Omaha, Neb.

Dr. Benj F. Bailey, Lincoln, Neb.

Dr. John I. Marker, Davenport, Iowa.

Dr. Daniel J. Glomset, Des Moines, Iowa.

Mr. Theodore Wiprud, Milwaukee, Wis., Secretary, Medical Society of the County of Milwaukee.

Dr. H. M. Workman, Tracy, Minn.

Mr. F. Manley Brist, St. Paul, Minn.

Dr. W. L. Burnap, Fergus Falls, Minn.

Dr. C. B. Wright, Minneapolis.

Mr. H. Van Y. Caldwell, Cleveland, Ohio, Secretary, Cleveland Academy of Medicine.

Dr. M. S. Henderson, Rochester, Minn. President, Minnesota State Medical Association.

Dr. R. G. Leland, Chicago.

Mr. E. M. Kingery, Des Moines, Iowa.

Dr. J. F. D. Cook, Langford, Secretary-Treasurer South Dakota State Medical Association.

Dr. L. R. Woodward, Mason City, Iowa.

Dr. Joseph F. Smith, Wausau, Wis.

Dr. E. A. Meyerding, St. Paul, Secretary Minnesota State Medical Association.

Dr. H. M. Johnson, Dawson, Minn.

The following papers were read:

"Legal Aspects of Contract Practice," Gerald O. Blake, Ass't Attorney General of Iowa.

This was a very lengthy discussion of the subject presented and is too voluminous to include in this report. I quote the second and third paragraph of his introduction. "You are now at a critical stage in your profession, as the changes in the social structure demand that the different professions make such alterations as may be necessary to meet and compete with business of today. Medical men are prone to think of their license to practice as a personal right or as a property right (an erroneous idea) and fail to think of it as a personal privilege granted them by the state because of their education, character and fitness, and the state, while recognizing merit, always retains the privilege of revoking the license if in the eyes of the law the licensee for any reason becomes unfit to continue the practice or fails or refuses to uphold the standards required by the state and which have been set up as a safeguard for the public."

"Contract Practice," John I. Marker, M.D., Davenport, Iowa.

"The Work of the Illinois State Medical Society Educational Committee," Harold M. Camp, M.D., Sec. Illinois State Medical Society.

Illinois carries on their crippled children's clinics under the direct supervision of the local medical society, and local clinicians in each instance. A specialist in each instance has been provided by the Scientific Service Committee. The State Medical Association carries on the Maternity and Infancy program and pre-school child examinations by the family physician in private and at a reasonable charge, where the families are able to pay.

The Illinois Federation of Women's Clubs and the Parent Teacher's Association, having in Illinois a membership of over 80,000 are giving cooperation in this work, and the relations with them have been very cordial. Dr. Camp emphasizes the fact that one thing, educational work is the best means, at the present time, of bringing the medical profession before the public.

Dr. C. B. Wright, Minneapolis, Chairman of the Committee on Legislative Activities of the American Medical Association, presented the subject of hospitalization of veterans of the World War.

In conference with President W. A. Bates, it was decided to ask each District Medical Society to appoint a committee of three World War Veterans and members of the American Legion from their membership. This committee to study

such material as may be presented through the American Medical Association Committee on Legislative Activities, presenting the plans to the membership of the American Legion anticipating a full co-operation in bringing about Federal Legislation whereby the non-service connected medical and surgical cases may be cared for in their home communities by the local hospital and family physician.

EDITORIAL BOARD OF THE JOURNAL LANCET

Your secretary has attended two meetings of the Editorial Board, one in Minneapolis and one in Fargo, North Dakota, January 29, 1932.

The Chairman of the Editorial Board, Dr. Myers asked that Dr. Bates appoint members to the Editorial Board to fill the vacancies. The publishers of the JOURNAL-LANCET reported that starting January 1st many of the so-called objectionable advertisements would be dropped from the JOURNAL-LANCET, and this plan carried out until all objectionable advertising had been eliminated.

MEMBERSHIP

From the financial report, 59 members have paid their 1931 dues since the last Annual Meeting. That for 1932, 216 members have paid their annual dues, with one district to hear from.

LISTING OF SOUTH DAKOTA PHYSICIANS

S. D. Physicians (latest A. M. A. Directory)

Deaths .....	27
Left State .....	18
Retired .....	11
	-----
	56
Indian Service .....	11
Federal Institutions .....	11
State Hospitals .....	7
State Institutions .....	6
	-----
	35

Back dues 1931, 59 members.  
Dues, 1932, 216.5 members.

DECEASED PHYSICIANS

M. C. Johnson, M.D., Aberdeen; G. R. Albertson, M.D., Vermilion; Robert A. Crawford, M.D., Chamberlain; John W. Dickey, M.D., Fort Pierre; Albert E. Kumpf, M.D., Hot Springs; Adolph Edward DeTuneq, M.D., Milbank; E. T. Stout, M.D., Pierre; N. W. Spencer, M.D., Sioux Falls; Arthur Henry Tufts, M.D., Sioux Falls; John Owen Duguid, M.D., Springfield (Honorary & Past President); Paul Hendriksen, M.D., Vienna; Franklin Henry Staley, M.D., Vienna;

Henry J. Herman, M.D., Webster; Albert C. Clark, M.D., Woonsocket; F. E. Lister, M.D., Faith (May 30, 1932) and R. J. Morrissey, M.D., Pierre.

(Signed) J. F. D. Cook, M.D.,  
Secretary-Treasurer.

Langford, S. D.,  
June 20, 1932.

Upon motion of Dr. Peabody, regularly seconded and carried, the report was adopted.

In the absence of the Chairman of the Council, Dr. Fred Treon, of Chamberlain, the Secretary read the following report of the Council, which was adopted on motion of Dr. Hohf, duly seconded and carried.

FIRST QUARTERLY MEETING OF COUNCIL

HURON, SOUTH DAKOTA

Sept. 29, 1931, Marvin Hughtit Hotel.

A quorum being present the Council discussed the problem of legislation. It was decided to consider as the major legislative activity the proposal of a Basic Science Bill.

That W. C. Woodward, M.D., of the Bureau of Legal Medicine, A.M.A., to assist in the preparation of such a Bill.

After considering various laws as adopted by sister states, it was decided to adopt a law, similar to the Nebraska law.

Council adjourned to meet at the call of the President.

J. F. D. COOK, M.D.,  
Secretary-Treasurer.

SECOND QUARTERLY MEETING OF COUNCIL

HURON, SOUTH DAKOTA

December 10th, 1931.

The meeting was called by the President, W. A. Bates, for a luncheon at 12:15 P. M. Roll call as follows: Pres. W. A. Bates, Pres-Elect J. R. Westaby, Vice-Pres. E. W. Jones, Secretary J. F. D. Cook, Councilors, H. W. Sherwood, C. E. Sherwood, Fred Treon, Chairman, A. S. Rider, H. R. Kenaston, and A. E. Bostrom.

There being a quorum present, the Chairman, Fred Treon, called the Council to order.

The question of the Annual Meeting was discussed and it was decided that the program consists of Dry Clinics in the A. M. and Papers in the P. M. That four outside men be procured to give the clinics in the A. M., and the papers

in the P. M. That men from the state be invited to present papers during the afternoon sessions.

That if the local committee consider a general meeting to which the laity be invited, that they consider Drs. Adams of Yankton, Willhite of Redfield, Ohlmacher of the Medical School, Vermilion.

The secretary proposed that we accept the invitation of the State Historian, Lawrence K. Fox, that our transactions be bound and deposited with the State Historical Society at Pierre. The bound volumes of the Journal-Lancet to be the property of the State Medical Association. The council directed that the secretary procure quotations on the cost of such binding, present the same at the next meeting of the council.

The consideration of the Basic Science problem was discussed freely and a motion by Dr. Bates, seconded by E. W. Jones that the Nebraska Basic Science Law be considered and that the necessary changes be made to conform to our needs, that Dr. Woodward of the Bureau of Legal Medicine, A.M.A., be asked to co-operate in the formulation of the required bill.

The consideration of the Nebraska Law, relating to liens of physicians, nurses and hospitals, for professional service rendered in the treatment of injuries for which the patient receives compensation, be considered as proper and constructive legislation. That we consider such a bill to be introduced at the next session of our legislature. Carried.

Informally suggested that the Extension Dept., of the University of Iowa, be asked to contribute to our program.

Program to consist of Medical, Surgical, Obstetrical, Pediatric and Roentgenological Clinics.

That the secretary send a circular letter to the officers of the component societies as soon as Basic Science Bill is completed, directing them to present the legislative program to the M.D.'s in their respective districts. Making contact with their legislators and sell them the necessity of the proposed laws.

J. F. D. COOK, M.D.,  
Secretary-Treasurer.

### THIRD QUARTERLY MEETING OF COUNCIL

On call of the President, W. A. Bates, the Council met in Huron, May 23, 1932.

The constructive criticism of W. C. Woodward, M.D. of the Bureau of Legal Medicine A.M.A., was presented to the Council for their considera-

tion. It was unanimously voted to adopt the Model Basic Science Bill as outlined by W. C. Woodward, M.D., with the addition of a registration clause, calling for an annual registration with an annual fee, similar to the Minnesota clause.

The secretary was directed to mimeograph bill as adopted for presentation to the House of Delegates.

J. F. D. COOK, M.D.,  
Secretary-Treasurer.

### REPORTS OF STANDING COMMITTEES

*Scientific Work*—The Secretary offered the program of the 1932 meeting as the report of the Committee.

The reports of the Committees on *Public Policy and Legislation* and *Publications* were contained in the report of the Council previously submitted.

*Medical Education and Hospitals*—Dr. J. C. Ohlmacher stated that there was nothing to report but that the last report submitted several years ago contained recommendations which might well be revived at the present time.

*Medical Economics*—The Secretary referred to the Committee a communication from the National Bureau of Economic Research, for study and report.

### REPORT OF COMMITTEE ON NECROLOGY

WHEREAS, in its immutable cycle of progression, Nature has caused numbers of our fellow practitioners in the art and science of alleviating suffering and healing the ill, to lay down their working tools of our craft forever, and,

WHEREAS, The following who have found rest were members of the South Dakota State Medical Association, in good standing:

M. C. Johnston, M.D., Aberdeen; G. R. Albertson, M.D., Dean, Medical School, University of South Dakota, Vermilion; Robert A. Crawford, M.D., Chamberlain; Adolph Edward DeTunco, M.D., Milbank; E. T. Stout, M.D., Pierre; Arthur Henry Tufts, M.D., Sioux Falls (Honorary); John Owen Duguid, M.D., Springfield (Honorary & Past Pres.); Paul Hendriksen, M.D., Vienna; Franklin Henry Staley, M.D., Vienna; Henry J. Herman, M.D., Webster; F. E. Lister, M.D., Faith, and R. J. Morrissey, M.D., Pierre.

WHEREAS: These, who were not affiliated with this Association nevertheless were doing their duty to God and Man as they saw it, and

serving their clientele with the same unselfishness that marks the true physician wherever found:

John W. Dickey, M.D., Fort Pierre; Albert E. Kumpf, M.D., Hot Springs; N. W. Spencer, M.D., Sioux Falls, and Albert C. Clark, M.D., Woonsocket (Member State Board of Health & Medical Examiners).

BE IT THEREFORE RESOLVED: That this, the South Dakota State Medical Association, duly assembled in its regular session, bow in humble submission to the will of the Almighty God of whom Nature is a visible manifestation knowing that death is the inevitable period to all our earthly struggles against frailties of humanity, and be it further

RESOLVED: That those of us who had the differences of opinion, or personal friction with some of our departed brothers, will think kindly of them, remembering the truth of the quotation from Kipling, that

“The sins you do by two and two,  
You pay for one by one,—”

and that many, if not most of us, have done the very things for which we have condemned others, but have not been found out.

By your committee,

L. J. PANKOW, M.D.,  
C. O. OLSON, M.D.,  
J. B. VAUGHN, M.D.

*Necrology*—Dr. Pankow moved that the report of the Necrology Committee to the 1931 meeting constitute the report of the present committee, substituting for the names therein the names of members deceased since the last convention, and that the report spread upon the records. The motion was regularly seconded and carried.

The President made the following Reference Committee appointments:

*Audits*

S. M. HOFF, M.D.,  
PERCY D. PEABODY, M.D.,  
H. W. SHERWOOD, M.D.

RESOLUTIONS AND MEMORIALS

J. C. Ohlmacher, M.D., A. Einar Johnson, M.D., and A. S. Johnson, M.D.

NOMINATIONS AND PLACE OF ANNUAL SESSION

J. D. Whiteside, M.D., Chairman; A. Einar Johnson, M.D.; D. S. Baughman, M.D.; B. M. Hart, M.D.; H. D. Sewell, M.D.; L. J. Pankow, M.D.; Thomas Cruickshank, M.D.; J. L. Stew-

art, M.D.; S. J. Walters, M.D., and A. E. Bostrom, M.D.

The President announced that an invitation had been received from The Commercial Club of Huron and the Secretary of the Huron District Society to hold the 1933 convention in Huron.

REPORTS OF SPECIAL COMMITTEES

*Advisory Committee Co-operating with South Dakota Public Health Association*—Dr. Bostrom reported that while the committee had held no meetings, it had conducted a number of informal discussions, had invited Mr. Cass, Managing Director of the South Dakota Public Health Association, to talk before the meeting last fall of the South Dakota Health Officers, and had endeavored to promote familiarity with the public health work.

*Committee on Veterans' Legislation*—The Secretary read from the Transactions of the New Orleans meeting of the American Medical Association a detailed record of the report of the Special Committee on Legislative Activities to the House of Delegates. There was discussion by Drs. William C. Woodward, H. D. Sewell, Percy D. Peabody, E. W. Jones and President Bates. Dr. L. J. Pankow moved that the President appoint a committee to draft a resolution to be presented to the House of Delegates, embracing the points covered by Drs. Sewell and Woodward. The motion was carried and the President appointed Drs. E. W. Jones, L. J. Pankow and A. E. Bostrom.

Dr. William C. Woodward, Director of the Bureau of Legal Medicine of the American Medical Association, presented a draft of a proposed basic science law, which was discussed at length. A motion was made by Dr. Pankow, seconded by Dr. Taylor and unanimously carried, that the basic science law as presented by Dr. Woodward be accepted.

It was voted, on motion of Dr. Jones, duly seconded and unanimously carried, that any reference to an annual registration fee be omitted from the basic science law and that the Council of the South Dakota State Medical Association be instructed and empowered to conduct a campaign of education among the physicians of the state before an annual registration bill is introduced in the legislature.

Further action was taken on a motion by Dr. Pankow, regularly seconded and unanimously carried, that the Council be empowered to handle this legislation, and that it be suggested to the Council that an educational policy among the

physicians be persued rather than the employment of a professional lobbyist.

Dr. Woodward stated that he would perfect the model draft of the basic science law and help in preparing the suggested circular of reasons for such a law to be used in educational campaign.

The Secretary presented a communication from the International Congress of the History of Medicine.

Upon motion, the meeting adjourned at 6 o'clock.

HOUSE OF DELEGATES

The House of Delegates held its second and final meeting at 7 o'clock at breakfast on Wednesday, June 22, the President, Dr. W. A. Bates, presiding.

Present:

OFFICERS

- W. A. Bates, M.D., Aberdeen, President.
- J. R. Westaby, M.D., Madison, President-Elect.
- E. W. Jones, M.D., Mitchell, Vice-President.
- J. F. D. Cook, M.D., Langford, Secretary-Treasurer.

COUNCILORS

- District 2—H. W. Sherwood, M.D., Doland.
- District 3—C. E. Sherwood, M.D., Madison.
- District 5—E. B. Taylor, M.D., Huron.
- District 6—B. A. Bobb, M.D., Mitchell.
- District 7—A. S. Rider, M.D., Flandreau.
- District 8—S. M. Hohf, M.D., Yankton.
- District 12—Charles Flett, M.D., Milbank.

COUNCILOR AT LARGE

- Percy D. Peabody, M.D., Webster.

DELEGATES

- Aberdeen District No. 1
  - E. A. Pittenger, M.D.....Aberdeen
  - J. D. Whiteside, M.D.....Aberdeen
  - C. G. Lundquist, M.D.....Leola
  - R. G. Mayer, M.D.....Aberdeen
- Watertown District No. 2
  - A. Einar Johnson, M.D.....Watertown
- Madison District No. 3
  - D. S. Baughman, M.D.....Madison
- Pierre District No. 4
  - B. M. Hart, M.D.....Onida
- Huron District No. 5
  - H. D. Sewell, M.D.....Huron
- Mitchell District No. 6
  - W. R. Ball, M.D.....Mitchell
  - C. S. Bobb, M.D.....Mitchell

Sioux Falls District No. 7

- J. B. Gregg, M.D.....Sioux Falls
- L. J. Pankow, M.D.....Sioux Falls

Yankton District No. 8

- S. M. Hohf, M.D.....Yankton
- Thomas Cruickshank, M.D.....Vermilion

Black Hills District No. 9

- J. L. Stewart, M.D.....Nemo

Whetstone Valley District No. 12

- A. P. Hawkins, M.D.....Waubay

On motion of Dr. L. J. Pankow, regularly seconded and carried, the House ratified the action of the Council in adopting the JOURNAL-LANCET as the official organ of the South Dakota State Medical Association for two years.

The Secretary read the minutes of the preceding meeting which were accepted as read on motion of Dr. Pankow.

Dr. Jones read the following resolution as the report of the Committee appointed to present a report on veterans' legislation:

RESOLUTION

Whereas the South Dakota State Medical Association has been informed that Legislation has been, or probably will be enacted by the Congress now in session, looking toward a thorough inquiry by a joint committee of the United States Senate and the House of Representatives into all Legislation now in force for the relief of Veterans, therefore be it

RESOLVED, That in the judgment of this Association, too much cannot be done by Federal and State Governments for the relief of Veterans suffering from disabilities that are the results of military service, and for the care of the widows and orphans of veterans whose deaths resulted from such service, and be it further

RESOLVED, That in the judgment of this Association there is no sound basis for the provision by the Federal Government for medical and surgical care for veterans suffering from disabilities that are not the result of military service, and every effort to provide such care will tend to limit the resources available for the relief of veterans suffering from service connected disabilities, and the widows and orphans of those veterans who died as the result of such military service, and be it further

RESOLVED, That if Congress in its wisdom sees fit to provide medical and hospital care for veterans suffering from disabilities, not the result of service, such care should be provided for in the localities in which the veterans reside, and

from the resources normally there available, and be it further

RESOLVED, That the council of this Association be authorized to send a copy of this resolution to the President, Congress, and to the Director of the Veterans Administration of the United States.

E. W. JONES, M.D., Mitchell,  
L. J. PANKOW, M.D., Sioux Falls,  
A. E. BOSTROM, M.D., DeSmet.

The resolution was adopted.

A motion made by Dr. Cruickshank was unanimously adopted that the Secretary send a letter from the Society to Dr. Fred Treon, conveying the good wishes and friendship of the members.

Dr. B. M. Hart presented the following report of the Advisory Committee to co-operate with the State Board of Health, which was adopted on motion of Dr. Hart.

#### REPORT OF ADVISORY COMMITTEE CO-OPERATING WITH THE STATE BOARD OF HEALTH

1. Our committee recommended that a committee of three be appointed by the president to co-operate with the State Board of Health and the South Dakota State Medical Association to investigate and report to the above named boards the laws governing the different branches of the healing art in South Dakota and the neighboring states.

2. We further recommend that the State Board of Health make efforts to have more complete and definite laws and regulations governing the control of all contagious and infectious diseases.

3. We further sanction and express our co-operation to the proposed Basic Science Law and its modification as advocated by Dr. William C. Woodward and advise that an educational program will be advanced not only to the doctors of the State, but to the general public, regarding the necessity of the control of the welfare of the health of her citizens.

4. We further would promulgate a more fraternal interest between the State Medical Association and the State Board of Health for a firmer and more united organization to overcome the medical problems which are before us. We further advise the great danger which lies before us regarding internal strife and jealousy in our own organization and hope that politics, greed and

gain for personal advantages, be a minor operation to the medical profession of our State.

(Signed) The Committee:

B. M. HART, M.D., Chairman, Onida  
E. W. JONES, M.D., Mitchell  
L. J. PANKOW, M.D., Sioux Falls

The Secretary read the following resolution of sympathy to Drs. B. M. Hart, P. B. Jenkins and Anton Hyden:

WHEREAS, Almighty God in His infinite wisdom has seen fit to call to Himself the beloved wives of our dear friends and brothers, B. M. Hart, P. B. Jenkins and Anton Hyden, be it therefore

RESOLVED, That we, the South Dakota State Medical Association, in regular assembly, extend our condolence and sympathy to our bereaved brothers.

The resolution was unanimously adopted.

It was voted, on the motion of Dr. Jones, that the Secretary prepare and send to those concerned a resolution of appreciation to the press of Watertown, especially the Public Opinion, and to the local society for their hospitality.

Dr. S. M. Hohf presented the report of the Committee on Audits, and stated that the records of the Treasurer had been found correct.

Dr. Gregg introduced the subject of reduction of dues, having been instructed by his society to do so. Drs. Stewart and Flett reported similar opinions from their societies. The matter was discussed by Drs. Rider, Taylor, Hohf, President Bates, Drs. Hart, C. E. Sherwood, Sewell, Pankow, Secretary Cook, and Drs. Peabody, H. W. Sherwood, Stewart and Cruickshank.

Dr. Pankow moved that the matter of changing the fiscal year of the South Dakota State Medical Association be considered by the Council in their sessions. The motion was seconded, but was found to be in conflict with the By-Laws and was withdrawn. Dr. Pankow then offered the following motion: that the President appoint a committee of men at not too divergent parts of the state to study the matter and offer a resolution at the 1933 Session with regard to the possibility and advisability of changing the fiscal year of the Society. The motion was seconded by Dr. Taylor and unanimously carried.

Dr. Greggs moved that the dues be reduced to \$5. Since the motion would require an amendment of the By-Laws, and it was too late to comply with the constitutional provisions for the introduction of amendments, the motion was de-

clared out of order. Dr. Ball then moved that the committee to consider the change of the fiscal year also take up the advisability of reducing the state society dues. The motion was seconded and carried.

A motion was made by Dr. Pankow, seconded and carried, that a recommendation be made to the Council that an appropriation be made sufficient to cover the expenses of postage for this committee in contacting district societies.

The subject of honorary membership was introduced by Dr. Cruickshank, and it was voted, on motion of Dr. Pankow, that the committee to consider changing the fiscal year also consider including honorary members in the subscription list of the JOURNAL-LANCET, the official organ of the Association.

The following report of the Nominating Committee was presented, and on motion of Dr. Pittenger it was voted to accept the report.

## REPORT OF COMMITTEE to HOUSE OF DELEGATES

### NOMINATIONS AND ELECTION OF OFFICERS

#### *Section 1-6 Chapter 4. By-Laws.*

Nominations. Two names for President-Elect. No two from the same District: E. W. Jones, M.D., W. A. Bates, M.D.

Vice-President: W. G. Magee, M.D., H. W. Sherwood, M.D.

Councilors whose terms expire this year. Term of office three years, unless otherwise stipulated.

Aberdeen District No. 1, 1935, E. A. Pittenger, M.D.

Watertown District No. 2, 1935, M. J. Hammond, M.D.

Pierre District No. 4, 1935, B. M. Hart, M.D.

Yankton District No. 8, 1935, S. M. Hohf, M.D.

Black Hills District No. 9, 1935, J. L. Stewart, M.D.

Delegate American Medical Association, 1933-35, W. A. Bates, M.D.

Alternate American Medical Association, 1933-35, J. F. D. Cook, M.D.

Place of 1933 Annual Meeting, Huron, S. D.

The President appointed Drs. Gregg and Taylor as tellers. The results of the votes were as follows:

President-Elect: E. W. Jones, M.D., 17 (Elected); W. A. Bates, M.D., 1.

Vice-President: W. G. Magee, M.D., 17 (Elected); H. W. Sherwood, 7.

### COUNCILORS

Aberdeen District No. 1: E. A. Pittenger, M.D., 22 (Elected).

Watertown District No. 2: M. J. Hammond, M.D., 15 (Elected); H. J. Bartron, M.D., 8. (Dr. Bartron was nominated from the floor by Dr. Sewell.)

Pierre District No. 4: B. M. Hart, M.D., 18 (Elected).

Yankton District No. 8: S. M. Hohf, M.D., 20 (Elected).

Black Hills District No. 9: J. L. Stewart, M.D., 19 (Elected).

Delegate to A.M.A. 1933-35: W. A. Bates, M.D., (Unanimously elected).

Alternate to A. M. A. 1933-35: J. F. D. Cook, M.D., (Unanimously elected).

It was voted unanimously that the 1933 session be held at Huron, S. D.

Dr. Stewart explained to the House of Delegates the reasons for non-attendance of members from the Black Hills District as due to geographic isolation and the extraordinary expense necessary to attend.

It was moved by Dr. Peabody, regularly seconded and unanimously carried, that the Secretary be instructed to convey to the members of the Black Hills District the regret of the House at their inability to attend, the warmest appreciation of the members of the House for their past support, and a desire for their continued co-operation.

The meeting adjourned at 9:20 o'clock.

### COUNCIL

The first meeting of the Council at the Fifty-First Annual Session of the South Dakota State Medical Association, held at Watertown, South Dakota, June 20-22, 1932, was held at 8:30 Monday evening, June 20, in the Hotel Lincoln.

In the absence of the Chairman, Mr. Fred Treon, according to constitutional provision the President of the Association, Dr. W. A. Bates, presided.

Present:

#### OFFICERS

W. A. Bates, M.D., Aberdeen, President.  
J. R. Westaby, M.D., Madison, President-Elect.  
E. W. Jones, M.D., Mitchell, Vice-President.  
J. F. D. Cook, M.D., Langford, Secretary-Treasurer.

#### COUNCILORS

District 2—H. W. Sherwood, M.D., Doland.  
District 4—A. A. McLaurin, M.D., Pierre.

District 5—E. B. Taylor, M.D., Huron.  
 District 7—A. S. Rider, M.D., Flandreau.  
 District 10—H. R. Kenaston, M.D., Bonesteel.  
 District 11—A. E. Bostrom, M.D., DeSmet.  
 District 12—Charles Flett, M.D., Milbank.

COUNCILOR AT LARGE

Percy D. Peabody, M.D., Webster.

Due to Dr. Treon's illness, Dr. E. W. Jones moved that Dr. B. A. Bobb, of Mitchell, act in the capacity of Temporary Councilor from the Sixth District for the present meeting and until such time as other arrangements may be necessary. The motion was seconded and carried.

Dr. J. F. D. Cook offered the following report as Secretary.

(See transactions House of Delegates)

Dr. Cook also presented the financial report as follows, which was accepted and referred to the Auditing Committee on motion of Dr. Peabody, duly seconded and carried.

REPORT OF SECRETARY-TREASURER

J. F. D. Cook, M.D.

DISBURSEMENTS

1931	
May 28	L. Miles, P. M., Stamps.....\$ 2.00
June 3	F. Miles, Stenographer ..... 25.00
3	Guests, Aberdeen ..... 10.00
3	Mrs. James Blake, Auxiliary ..... 30.00
3	Badges, May 25, 1931 ..... 75.61
3	J. F. D. Cook, April 1, 1931 ..... 50.00
3	L. N. Grosvenor, A. M. A. Delegate 200.00
9	L. Miles, Supplies ..... 12.82
11	Ward Hotel ..... 156.15
11	Miss Cheskey, Registration ..... 15.00
11	Aberdeen District Medical Society.. 350.00
11	Wm. Boyd, Exp. R. R. Fare..... 70.50
12	J. F. D. Cook..... 100.00
12	H. E. Michelson, R. R. Fare..... 27.03
16	F. R. Harding, Supplies ..... 2.50
26	Journal-Lancet (January 1, 1931, to June 30, 1931) ..... 324.00
30	Aberdeen National Bank (Exchange) .05
30	Farrar's Drug Store, Supplies..... 8.05
July 3	J. F. D. Cook ..... 100.00
6	Searles' Printing Co. .... 15.44
8	Langford Telephone Co. .... 13.25
9	A. M. A. Directory ..... 12.00
11	L. Miles, Printing ..... 5.90
24	Master Reporting Co. .... 402.66
25	Miss Daniels, Reporting ..... 3.00
25	Miss Neimiller, Reporting ..... 3.00
28	L. Miles, Printing ..... 19.10
Aug. 15	Searles' Bros., Supplies ..... 4.50
Sept. 15	L. Miles, Printing ..... 5.54
2	J. F. D. Cook ..... 25.00
28	Farrar's Drug Store, Supplies..... 1.70
29	Marvin Hughitt Hotel (Council).... 14.50
Nov. 17	L. Miles, P. M., Printing Letterheads 18.75
17	L. Miles, P. M., Stamped Envelopes.. 13.18
20	J. F. D. Cook ..... 75.00
27	Martins & Goldsmith, Legal Service. 75.00
25	F. R. Harding (Treas. Bond)..... 2.50
25	Langford Telephone Co., Messages.. 5.65

Dec. 2	Hoffman Florist (Albertson) .....	4.00
15	Journal-Lancet (July 1, 1931, to December 31, 1931) .....	310.00
10	Marvin Hughitt Hotel (Council)....	10.50
12	J. F. D. Cook .....	50.00
14	J. F. D. Cook .....	50.00
30	V. E. Farrar (Mimeo Paper and Stencils) .....	9.10
1932		
Jan. 4	Langford Telephone Co. ....	1.30
Feb. 2	J. F. D. Cook .....	25.00
3	J. F. D. Cook .....	50.00
9	Thomas D. Allen, R. R. Fare.....	62.66
17	J. F. D. Cook .....	25.00
20	J. F. D. Cook (Exp. Regional Conf.)	26.45
Mar. 11	J. F. D. Cook .....	50.00
Apr. 16	J. F. D. Cook .....	10.00
16	J. F. D. Cook .....	38.10
19	Seibrecht Flowers (Johnston).....	10.00
22	A. M. A. Delegate (Exp. New Orleans) .....	201.50
23	Langford Telephone Co. ....	6.00
May 19	L. Miles, P. M. (Stamped Envelopes)	27.85
21	Farrar's Drug Store (Mimeo Paper)	9.50
23	Marvin Hughitt Hotel (Council)....	6.00
June 10	L. Miles, P. M. (Stamped Envelopes)	13.30
11	L. Miles, P. M., Stamps .....	3.00
15	Balance Salary, J. F. D. Cook, \$190; Expense, \$25.00 .....	26.90
15	Check to Langford State Bank O. D.	.98
15	L. Curfman, R. R. Agent, Message, Washington, D. C. ....	1.74
Total .....		\$3,303.26

RECEIPTS

DEPOSITS

1931	
June 10	Aberdeen, 12 Members .....\$ 120.00
17	Black Hills, 9 Members ..... 90.00
18	Deposit, 4 Members ..... 40.00
19	Mitchell, 1 Member ..... 10.00
25	Sioux Falls, 5 Members ..... 50.00
25	Cash Refund (L. N. Grosvenor).... 25.00
30	Black Hills, 1 Member ..... 10.00
July 1	Rosebudy, 1 Member ..... 10.00
8	Sioux Falls, 4 Members ..... 40.00
Aug. 12	Whetstone, 1 Member ..... 10.00
12	Sioux Falls, 2 Members ..... 20.00
12	Black Hills, 3 Members ..... 30.00
12	Aberdeen, 2 Members ..... 20.00
17	Black Hills, 3 Members ..... 30.00
Sept. 17	Sioux Falls, 2 Members ..... 20.00
17	Mitchell, 1 Member ..... 10.00
17	Black Hills, 1 Member ..... 10.00
17	Aberdeen, 1 Member ..... 10.00
25	Black Hills, 1 Member ..... 10.00
25	Sioux Falls, 1 Member ..... 10.00
Oct. 13	Black Hills, 2 Members ..... 20.00
Nov. 14	Sioux Falls, 1 Member ..... 10.00
14	Aberdeen, 1 Member ..... 10.00
Total—59 Members	
1932	
Jan. 2	C. D. L. S. Bank, 11234.....\$49.06
	Interest, 11234 ..... 1.95
	Int. C. D., 11232 ..... 1.96
	Int. C. D., 11233 ..... 3.92
	Int. C. D., 11528 ..... 3.63
60.53	
Feb. 9	North Dakota State Medical Association ..... 479.35
Mar. 4	Rosebud, 9 Members ..... 90.00
17	Black Hills, 21 Members ..... 210.00

Apr.	1	Watertown, 21 Members	210.00
	5	Yankton, 32 Members	320.00
	11	Yankton, 1 Member	10.00
	11	Watertown, 1 Member	10.00
May	6	Sioux Falls, 26 Members	260.00
	24	Kingsbury, 1 Member	10.00
June	7	Aberdeen, 30½ Members	305.00
	7	Kingsbury, 5 Members	50.00
	7	Pierre, 6 Members	60.00
	7	Sioux Falls, 6 Members	60.00
	7	Mitchell, 18 Members	180.00
	8	Black Hills, 7 Members	70.00
	9	Madison, 13 Members	130.00
	11	Aberdeen, 5 Members	50.00
	11	Whetstone, 14 Members	140.00
	18	Deposit (L. S. B., O. D.)	.98
		Total—216½ Members	<u>\$3,320.86</u>

SUMMARY

Balance Aberdeen National Bank (May 26, 1931)	\$2,247.22
Balance Langford State Bank (May 13, 1931)	108.68
Total Deposits (May 13, 1931, to June 17, 1932)	<u>3,320.86</u>
	\$5 676.76
Disbursements (May 28, 1931, to June 15, 1932)	<u>3,303.26</u>

Balance Aberdeen National Bank (June 17, 1932)	\$2,373.50
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RESOURCES

Cash Balance Aberdeen National Bank, as above	\$2,373.50
C. D. Langford State Bank No. 11232	49.06
C. D. Langford State Bank No. 11233	98.12
C. D. Langford State Bank No. 11528	90.68
Trust Certificate Langford State Bank No. 375	735.92
City of Rapid City, S. D., Bond	500.00
Total	<u>\$3,847.28</u>

J. F. D. COOK, M.D., Secretary-Treasurer.

Langford, S. D., June 20, 1932.

The President appointed a Committee on Audits composed of:

- S. M. Hohf, M.D.,
- Percy D. Peabody, M.D.,
- H. W. Sherwood, M.D.

REPORTS OF COMMITTEES

*Public Policy and Legislation*—In the absence of the Chairman of the Committee, Dr. Cook stated that the activities of the Committee (covered in the report of the Council) had been primarily concerned with the basic science law: also co-operation with the South Dakota Hospital Association in financing legal counsel in the Bartron case in the Supreme Court.

*Publication*—Dr. Cook read the minutes of meetings of the Editorial Board of the JOURNAL-LANCET June 19, 1931, and November 19, 1931:

He also read a communication from Mr. F. S. Lewis of the JOURNAL-LANCET staff.

Dr. Cottam, of Minneapolis, spoke briefly on behalf of the Journal and the desire of the Edi-

torial Board to carry out the wishes of the Association in regard to advertising material, literary content, etc.

It was voted, on motion of Dr. Percy D. Peabody, seconded by Dr. H. W. Sherwood, and unanimously carried, that the JOURNAL-LANCET be made the official organ of the South Dakota Medical Association for the next two years.

For the Local Committee on Arrangements, Secretary Cook outlined the entertainment features provided for the delegates and their wives.

Consideration of the budget was deferred to the final meeting of the Council.

The meeting adjourned at 9:20 o'clock.

COUNCIL

The final meeting of the Council was held at luncheon at 12:30 on Wednesday, June 22, the President, Dr. W. A. Bates, presiding.

The Secretary read the minutes of the preceding meeting, which, on motion regularly made, seconded and carried, were accepted as read.

Dr. S. M. Hohf moved that the Secretary be instructed to put the cash funds on hand after the payment of debts, to the purchase of U. S. Government bonds.

It was voted, on motion of Dr. C. E. Sherwood, regularly seconded and carried, that the Aberdeen National Bank be designated as the depository for the next year.

The Secretary, Dr. Cook, read a letter from Dr. F. V. Willhite, Redfield, regretting his inability to be present and take his place on the scientific program, because of illness in his family.

There being no further business to come before the meeting, the Council adjourned at 1:20 o'clock.

MINUTES OF SCIENTIFIC MEETINGS

Tuesday Morning, June 21, 1932

The first of the scientific meetings of the Fifty-First Annual Session of the South Dakota State Medical Association at Watertown, was called to order at 9:20 a. m. in the Old Metropolitan Theater by the President, Dr. W. A. Bates, of Aberdeen.

There was a clinic on allergy by Dr. W. W. Duke of Kansas City, and a surgical clinic by Dr. H. M. Richter, of Chicago.

Tuesday Afternoon, July 21, 1932.

President Bates called the meeting to order at 1:15 and delivered his Presidential Address.

The following addresses were presented:

"The Surgical Treatment of Peptic Ulcer," by Dr. H. M. Richter, Chicago.

"The Dawn of a Specialty in Medicine—Allergy," by Dr. W. W. Duke, of Kansas City.

"Roentgen Diagnosis in Preventive Medicine," by Dr. Leo G. Rigler, Minneapolis.

Banquet, Tuesday Evening, June 21, 1932

The Association dinner was held at the Hotel Lincoln, Dr. W. G. Magee, Watertown, acting as Toastmaster.

There were vocal selections by Mrs. F. H. Roost, Sioux City.

Dr. James H. Lockwood, President of the Watertown District Medical Society, welcomed the guests.

The Toastmaster introduced the President-Elect, Dr. J. R. Westaby, Madison, who made a brief response.

There were addresses by Dr. Willard Allen Bates, Aberdeen, President of the Association; Dr. William C. Woodward, Director of the Bureau of Legal Medicine of the American Medical Association, Chicago; Dr. A. G. Pohlman, Vermilion, Dean of the Medical School of the University of South Dakota; and Dr. Herman G. James, Vermilion, President of the University of South Dakota.

Wednesday Morning, June 22, 1932

President Bates called the meeting to order at 9:15 a. m.

Dr. L. S. McGoogan, Instructor of Gynecology and Obstetrics, University of Nebraska College of Medicine, gave a gynecological clinic.

Dr. J. E. Gonce, of Madison, Wis., presented a pediatric clinic.

Dr. J. C. Ohlmacher, Vermilion, delivered an address on "The Functional Basis of Certain Kidney Diseases with Brief Consideration of the More Common Kidney Lesions."

Wednesday Afternoon, June 22, 1932

The meeting convened at 2:20 o'clock, President Bates presiding.

The incoming President, Dr. J. R. Westaby, of Madison, was inducted into office, made a brief response, and assumed the chair. The new President-Elect, Dr. E. W. Jones, was introduced.

The following papers were presented:

"Infantile Paralysis, Diagnosis and Treatment," by Dr. J. E. Gonce, of Madison. Discussed by Drs. J. L. Pankow, Sioux Falls; H. W. Sherwood, Doland; H. E. Watson; C. E. Sherwood, Madison; M. J. Hammond, Watertown; Charles Flett, Milbank; and E. M. Young, Mitchell.

"Toxic Neuronitis in Pregnancy," by Dr. L. S. McGoogan, of Omaha. Discussed by Dr. D. S. Baughman, Madison.

"Spinal Anesthesia," by Dr. Owen King, of Aberdeen. Discussed by Drs. B. A. Bobb, Mitchell; H. M. Freeburg, Watertown, and A. P. Peeke, Volga.

The meeting adjourned at 4:20 o'clock.

J. F. D. COOK, M.D., Secretary.

#### PRESIDENTIAL ADDRESS

WILLARD ALLEN BATES, M.D., F.A.C.S.,\*

*Aberdeen, S. D.*

Members of the State Medical Society:

It has been customary during the past, for the retiring president of your society to give an address at the annual meeting. This gives me an opportunity to thank the members of this association for the honor of being your president during the past year.

It has always been a pleasure to look forward each year to the annual meeting when we meet old friends and renew old acquaintances. When I think of the eminent men who have addressed this association on similar occasions in the past, I regret my inability to measure up to your expectations in the giving of a presidential address. In selecting material for my remarks, I wish to discuss some of the economic, political and organization problems as they affect the medical men of this state today.

From the time of Hippocrates down to the present we have had many brilliant men of medicine, some of these men leaving the beaten paths of practice to blaze new trails that were destined to become the beaten paths of the future. Many of these endeavors were an advancement in better methods of diagnosis and treatment, thus adding materially to what was already known in every branch of medical science; while others confined their thoughts and visions to the ethical side of practice, building up rules and customs to govern the relationship of one physician to another and paving the way for harmonious and friendly competition between physicians, with the welfare of the patient always foremost in mind.

Along with these advances in medical science and ethics, there were visions of the future physician—his qualifications, experience, surroundings and the necessary legislations that would be needed to bring medicine out of chaos and put it on a firm foundation, thus building up a stand-

\*Read at the Fifty-first Annual Session of the South Dakota State Medical Association, Watertown, S. D., June 20, 21, 22, 1932.

ard of requirements, premedical education through medical training with adequate hospital experience.

With the many young doctors entering the profession today, well qualified to meet the obligations that scientific medicine owes the public, we may see how well these visions were carried out by the medical men of many years ago who undertook the solution of these great problems and their untiring efforts which brought about legislation, weeding out the undesirable elements and bulding the medical structure we have today.

With all that has been accomplished during the past for our benefit and the welfare of medicine, is this structure so perfect and complete that it will survive down through to the end of time and meet all the needs of the future? If we measure up to the responsibilities of the present as well as the master minds of medicine in the past, we, too, will have to have visions of the future; we, too, will have to direct legislation for the eradication of evils that are misguiding our people and are a nuisance to scientific medicine.

Following the late war, we encountered a wave of prosperity and the luxuries of a few years ago became necessities of life. Everything conceivable for the comfort, pleasure and entertainment of our people was provided. Medicine, likewise, progressed by leaps and bounds. People who had previously been cared for in their homes were rushed to the hospital. Diseases which during the past were considered incurable became curable with new remedies and modern hospital management, mortality and morbidity were greatly lessened, but with an ever-increasing cost to the patient. Health centers and preventative medicine became a reality and epidemics that had been the scourge of the past were almost a matter of history.

Healers and quacks had likewise come into the picture and their promises far exceeded the most sanguine expectations of medicine. With these there was no scientific foundation, no educational requirement and only a money-grabbing possibility. Then as the pendulum had swung far to the side of prosperity, it came back and we are now in the midst of a financial crisis and depression, with our people filled with confusion and not knowing which way to turn.

The press and the radio have also aided in the general perplexity by fake advertising and their many articles published on the high cost of medical treatment and hospitalization. The facts remain that the price of medical services has changed very little during the last decade. The only

change that has raised the cost is the added laboratory, nursing and hospital care and these have made diagnosis and treatment much more exact and effective and often life-saving.

Physicians have from time immemorial set up the highest standards in treating the sick and afflicted—the rich and the poor alike. Cheerfully, they have given their services where no remuneration was expected. The stimulus that has caused research, resulting in discoveries of newer and better methods of treatment, has not been money, as all of these have been given to the world gratis. While these sacrifices are the ideals of medicine to the physician, with the people they are only the things expected and no appreciation is needed.

Our people really never get the facts about the great discoveries in medicine as they are never printed, except in medical literature. Frequently we read of some sensational medical achievement in our daily papers that is not authentic and which is very much misleading to the people. Articles have been published in the leading magazines which have belittled our physician and carried a very much misleading impression. Great startling headlines accusing doctors of atrocious crime when they were only quacks and not really members of the medical profession. Many people read these things and form opinions that physicians are careless, neglectful and even criminal at times. With all of this and occasionally a slighting remark of some of our physicians, regarding a result in a case cared for by another physician, is there any wonder that suit for malpractice frequently occurs?

In our state malpractice, ever a thorn in the side of medicine, has been definitely increasing. The reckless way that our judges and juries have given verdicts, even \$10,000 to \$18,000 in trivial cases, with no actual foundations, demands more than passing thought.

Lawyers tell me that these cases where suits have been brought for alleged damages against a physician and no physician has testified for the prosecution, failures have usually resulted. This brings up the question, why do we ever testify for the prosecution against our brother physician? Often an old grudge is the causative factor and one case provokes another. Then at other times we are friends of the prosecuting attorney or the disgruntled patient and we might lose business.

We console ourselves with the fact that we are not going to say anything damaging against the doctor or that the insurance company will have to pay the damages and costs anyway and here

lies the serious side of the question, does anyone believe that these companies are charitable institutions? No, the physicians of this state are paying in the way of increase in premiums and the need of increased protection. Some of these companies are withdrawing from our state and others are planning a remedy which will be very effective. While they are not giving it out publicly, I got this information from satisfactory sources and believe it to be correct. They are making up records of cases and of physicians aiding the enemy, with the result that in the near future a physician who has helped the prosecution of another physician will be as good a risk for protective insurance as a T. B. case is today for life insurance. It is not so much what we say, as the moral influence and sympathy we apparently give to the prosecution before the judge and the jury.

A few years ago, for political reasons, our state entered into the retail gasoline business and when later these political reasons no longer existed, they withdrew from the business. Likewise, our Federal Government from time to time, apparently for the same reason, has entered into competition with private citizens and of late with the medical profession, establishing hospitals for the care of non-service connected disabilities of our war veterans and in thousands of cases where the veterans were well able to pay for the services of their family physicians.

Our state legislature has, during the past, licensed any form of healing which was asked for with no inquiry into its nature, whether scientific or otherwise, with the results that chiropractors and osteopaths are prescribing medicine and treating all kinds of diseases and even the chiroprodists are licensed to do minor surgery.

While all of these things have been going on, our physicians have been caring for the sick and afflicted, the rich and the poor alike, with no thought of the future, satisfied that their activities and efforts were securing the needs of the present and ever alert for the newer methods of diagnosis and treatment. Medical societies also have apparently been content with supplying the scientific needs of its members and giving little thought to the business side of practice.

From time to time legislative issues have arisen and our officers have written us asking that we telegraph our legislators to vote for or against these bills, giving no time for discussion or explanation. Our by-laws require our council to meet quarterly for the discussion and preparation of medical legislation and an attempt has

been made during the past year to carry this out, with the results that your council and officers have prepared a Basic Science bill and have laid a foundation for bringing it before the coming legislature.

The American Medical Association has all too little influence on the Federal Government and this is because physicians are not politically-minded, while the cults are very much inclined that way. They have 100 per cent membership, pay double the dues that we do and their state association spends large sums each legislative year for attempted legislation.

While it is all very well to carry on research and medical progress, the physicians of this state should be concerned in the welfare of medicine. With all of our sister states passing basic science laws, our state will soon be the dumping ground for the cults that are here and many yet to be born. Of course, we do not consider them any competition in a professional way, but politically it is another thing.

With all of the unjust and untrue criticisms the medical profession has received of late years, from the outside, and our motives questioned, even when we are trying to save the people from quacks and imposters, legislation becomes more difficult each year. Due to the fact that we have not had any legislative program before the legislature for several years that has amounted to anything and the changing personnel of the legislature, which will likely occur this year, it should be an opportune time for us to get busy.

During past years when our officers have gone before the legislature with bills, they have been told that the medical society did not represent the views of the profession of this state and this was because of the fact that there were many men practicing medicine who were not members and also because we did not present a solid front. If we are ever going to reach a successful goal in legislative matters, we will have to get together and stand by our consul and officers. Each district society will have to see that they have committees that will interview legislators on both sides before they are elected and also again after they are elected. We will have to have the influence of our physician politicians and after all of the work has been done by our members in each district, we should have a first-class lobbyist to put our bill before the legislature and pay him on the sliding scale plan.

Every physician privileged to practice medicine in this state should make it his duty to be-

come affiliated with this district medical society and every physician practicing in this state should back any bill put up by our council and officers and if you cannot be a booster, don't be a knocker.

Brother physicians, it is absolutely up to us to put our shoulder to the wheel and do our part. Let us lay aside our petty grievances and jealousies for the sake of the greater cause and present a solid front, that we may attain the position in this state that we owe organized medicine. With ever our watchword, "The Law of the Jungle."

Now this is the law of the jungle,  
As old and as true as the sky  
And the wolf that shall keep it will prosper;  
And the wolf that shall break it will die.

As the creeper girdles the tree tops,  
The law runneth forth and then back,  
That the strength of the pack is the wolf  
And the strength of the wolf is the pack.

Yes, that is the law of the jungle  
It is old, I admit, but still,  
If we choose from our midst, the good leader,  
We can do anything that we will.

As human, we're apt to grow lazy.  
We leave it for others to do.  
It's easy to wish things would happen  
But harder to make them come true.  
So let us return to the jungle, and,  
As the mother wolf teaches her whelp,  
Let us, all of us, work with our leader  
And give him our full share of help.

#### MINUTES OF THE REGULAR ANNUAL MEETING

OF THE SOUTH DAKOTA O. A. L. R.,  
WATERTOWN, S. D.,

June 21, 1932

The meeting was called to order by President Grosvenor at 10 A. M. At this time a paper was presented by Kenneth A. Phelps, M.D., entitled "Some Experiences in Bronchoscopy." Numerous slides were shown to bring out the salient points of the paper. The discussion was opened by Dr. Leo G. Rigler, of Minneapolis, who also showed some slides to demonstrate the

necessity for Bronchoscopy. He was followed by Drs. J. B. Gregg, Sioux Falls, H. C. Peabody, of Webster, and F. H. Roost, of Sioux City, Iowa. A feature of the paper stressed by Dr. Phelps was the immediate use of soft rubber tubes to keep the esophagus dilated after a burn from lye. J. F. Parsons, M.D., of Crookston, Minnesota, presented a paper on Local Anaesthesia. He demonstrated the technique of local and block anaesthesia by diagrams in a very thorough manner and giving very minute details. This paper was discussed by Drs. J. A. Hohf, of Yankton, F. H. Roost, H. C. Peabody, and H. L. Saylor, of Huron.

Dr. F. H. Roost, of Sioux City, Iowa, next presented a paper on "Incidence of Focal Infection in Acute Sinus Diseases and Treatment," and gave a résumé of modern opinions of those who have made the most extended study of this matter. This paper was discussed by Drs. R. A. Kelly, J. A. Hohf, C. F. Robbins, and H. C. Peabody. Dr. C. F. Robbins presented a paper on "Thrombophlebitis of the Lateral Sinus." This paper was very thorough as to references and statistics of recognized authors and included seven case histories with references to special features of each case. This paper was discussed by Drs. Parsons, F. H. Roost, J. A. Hohf, J. B. Gregg, Mabee and C. C. Hoagland.

The officers were commended for the very excellent program presented.

Members present were:

Drs. Johnson, Hohf, Keller, Grosvenor, Saylor, Gregg, Mabee, Kelly, Robbins, Peabody, Hoagland, Smith and Miller. Visiting M.D.'s were Rigler, Parsons, Roost, Phelps, Taylor and Gregory.

Minutes of last meeting read and approved.

Report and acceptance of Secretary-Treasurer.

Dr. J. B. Gregg, Sioux Falls, was elected President.

Dr. J. A. Hohf, Yankton, was elected Vice-President.

Dr. H. L. Saylor, Huron, was elected Secretary-Treasurer.

Motion carried to have fall meeting at Mitchell between December 1-10.

Motion carried to adjourn.

H. L. SAYLOR, Secretary.

## DISTRICT AND COUNTY ROSTER

## ABERDEEN DISTRICT MEDICAL SOCIETY—NO. 1

PRESIDENT  
Murdy, B. C. . . . .Aberdeen

SECRETARY  
McCarthy, P. V. . . . .Aberdeen

Ahlfs, J. J. . . . .Conde  
Aldrich, H. H. . . . .Forman, N. D.  
Alway, J. D. . . . .Aberdeen  
Bates, W. A. . . . .Aberdeen  
Bloemendaal, G. J. . . . .Cresbard  
Bruner, J. E. . . . .Frederick  
Cook, J. F. D. . . . .Langford  
Cooley, F. H. . . . .Redfield  
Countryman, G. E. . . . .Aberdeen  
Crain, F. M. . . . .Redfield

Creamer, F. H. . . . .Dupree  
Eckrich, J. A. . . . .Aberdeen  
Gelber, R. . . . .Britton  
Gerdes, O. H. . . . .Eureka  
Graff, L. W. . . . .Britton  
Hogeboom, C. F. . . . .Bowdle  
Jackson, E. B. . . . .Aberdeen  
Jones, T. D. . . . .Aberdeen  
Keegan, Agnes M. . . . .Aberdeen  
King, H. I. . . . .Aberdeen  
King, Owen. . . . .Aberdeen  
Larson, A. J. . . . .Mobridge  
Lowe, C. E. . . . .Mobridge  
Lundquist, C. G. . . . .Leola  
Mayer, R. G. . . . .Aberdeen

Milan, M. Geo. . . . .Aberdeen  
Miller, Frank . . . . .Aberdeen  
Olson, C. O. . . . .Groton  
Pittenger, E. A. . . . .Aberdeen  
Potter, G. W. . . . .Redfield  
Rademacher, C. J. . . . .Hoven  
Ramsey, E. T. . . . .Clark  
Ranney, T. P. . . . .Aberdeen  
Rice, D. B. . . . .Britton  
Sarchet, Geo A. . . . .Mobridge  
Twining, G. H. . . . .Mobridge  
Watson, Ernest . . . . .Aberdeen  
Weishaar, C. H. . . . .Aberdeen  
White, W. E. . . . .Ipswich  
Whiteside, J. D. . . . .Aberdeen

## WATERTOWN DISTRICT MEDICAL SOCIETY—NO. 2

PRESIDENT  
Lockwood, J. H. . . . .Henry

SECRETARY  
Duncan, Wm. . . . .Watertown

Bartron, H. J. . . . .Watertown  
Bates, J. S. . . . .Clear Lake  
Brown, R. H. . . . .Watertown

Campbell, R. F. . . . .Watertown  
Christensen, A. H. . . . .Clark  
Freeburg, H. M. . . . .Watertown  
Hammond, M. J. . . . .Watertown  
Johnson, A. E. . . . .Watertown  
Koren, F. . . . .Watertown  
Kenney, H. T. . . . .Watertown  
Magee, W. G. . . . .Watertown  
McIntyre, P. S. . . . .Bradley

O'Connor, T. F. . . . .  
 . . . . .New Rockford, N. D.  
Richards, G. H. . . . .Watertown  
Rowe, A. N. . . . .Estelline  
Scallin, Paul R. . . . .Clark  
Sherwood, H. W. . . . .Doland  
Tarbell, H. A. . . . .Watertown  
Vaughn, J. B. . . . .Castlewood  
Williams, C. A. . . . .Doland

## MADISON DISTRICT MEDICAL SOCIETY—NO. 3

PRESIDENT  
Davidson, Magni. . . . .Brookings

Baughman, D. S. . . . .Madison  
Goldman, E. W. . . . .Madison

Hoagland, C. C. . . . .Madison  
Jordan, L. E. . . . .Chester  
Kellogg, H. E. . . . .Brookings  
Miller, H. A. . . . .Brookings  
Sherwood, C. E. . . . .Madison

Tillisch, Henrik. . . . .Brookings  
Torwick, E. E. . . . .Volga  
Westaby, J. R. . . . .Madison  
Westaby, R. S. . . . .Madison  
Whitson, G. E. . . . .Colman

## PIERRE DISTRICT MEDICAL SOCIETY—NO. 4

PRESIDENT  
McLaurin, A. A. . . . .Pierre

SECRETARY  
Robbins, C. E. . . . .Pierre

Hart, B. M. . . . .Onida  
Martin, H. B. . . . .Harrold

Northrup, F. A. . . . .Pierre  
Riggs, T. F. . . . .Pierre

## HURON DISTRICT MEDICAL SOCIETY—NO. 5

PRESIDENT		Faust, J. H.....Huron	Sprague, B. H.....Huron
Sewell, H. D.....Huron		Feige, C. A.....Canova	Taylor, E. B.....Huron
SECRETARY		Griffith, W. H.....Huron	Tschetter, J. S.....Huron
Buchanan, R. A.....Huron		Mattlock, W. L.....Huron	Turner, J. F.....Miller
Burman, G. E.....Carthage		Saxton, W. H.....Huron	Wood, T. J.....Huron
		Saylor, H. L.....Huron	Wright, O. R.....Huron
		Shirley, J. C.....Huron	

## MITCHELL DISTRICT MEDICAL SOCIETY—NO. 6

PRESIDENT		Bobb, B. A.....Mitchell	Kimble, O. A.....Murdo
Malloy, J. F.....Mitchell		Delaney, Wm. A.....Mitchell	Kelly, R. A.....Mitchell
SECRETARY		Gifford, A. J.....Alexandria	Mabee, Don R.....Mitchell
Rohwer, R. T.....Mitchell		Gillis, F. D.....Mitchell	Mabee, O. J.....Mitchell
Ball, W. R.....Mitchell		Jenkinson, H. E.....	Tobin, F. J.....Parkston
Bobb, C. S.....Mitchell		.....Wessington Springs	Waldner, J. L.....Parkston
		Jones, E. W.....Mitchell	Young, E. M.....Mitchell

## SIOUX FALLS DISTRICT MEDICAL SOCIETY—NO. 7

PRESIDENT		Egan, M. H.....Sioux Falls	Nessa, N. J.....Sioux Falls
Zimmerman, G. E.....Sioux Falls		Erickson, O. C.....Sioux Falls	Nilsson, F. C.....Sioux Falls
SECRETARY		Gregg, J. B.....Sioux Falls	Opheim, O. P.....Sioux Falls
Forsberg, C. Wm.....Sioux Falls		Groebner, O. A.....Sioux Falls	Pankow, L. J.....Sioux Falls
Billingsley, P. R.....Sioux Falls		Grove, A. F.....Dell Rapids	Parke, L. L.....Canton
Billion, T. J.....Sioux Falls		Hannon, L. J.....Hartford	Perkins, E. L.....Sioux Falls
Cottam, G. I. W.....Sioux Falls		Hanson, O. L.....Valley Springs	Putnam, E. D.....Sioux Falls
Craig, D. W.....Sioux Falls		Hummer, H. R.....Canton	Reagan, R.....Sioux Falls
Culver, C. F.....Sioux Falls		Kellar, S. A.....Sioux Falls	Rider, A. S.....Flandreau
DeVall, F. C.....Garretson		Keller, W. F.....Sioux Falls	Stenberg, E. S.....Sioux Falls
Donahoe, S. A.....Sioux Falls		Lamb, Hazel.....Sioux Falls	Stern, M. A.....Sioux Falls
Eagan, J. B.....Dell Rapids		Moe, A. J.....Sioux Falls	Stevens, R. G.....Sioux Falls
		Meyer, H. C. E.....Sioux Falls	Van Demark, G. E.....Sioux Falls
		Mullen, R. W.....Sioux Falls	

## YANKTON DISTRICT MEDICAL SOCIETY—NO. 8

PRESIDENT		Burkland, P. R.....Vermilion	Keeling, C. M.....Springfield
Ohlmacher, J. C.....Vermilion		Bushnell, Wm. F.....Elk Point	Klima, H.....Tyndall
SECRETARY		Creelius, H. A.....Lakeport, Calif.	Landmann, G. A.....Scotland
Hohf, J. A.....Yankton		Cruickshank, Thos.....Vermilion	Moore, F. A.....Yankton
Abts, F. J.....Yankton		Dugan, Thos. A.....Wagner	Morehouse, E. M.....Yankton
Adams, G. S.....Yankton		Freshour, Ina M.....Yankton	Smith, F. C.....Yankton
Beall, L. F.....Irene		Hanson, H. F.....Vermilion	Stansbury, E. M.....Vermilion
Benesh, L. C.....Freeman		Hill, John F.....Yankton	Treirweiler, J. E.....Yankton
Bigler, Lottie G.....Yankton		Hohf, S. M.....Yankton	Willhite, F. V.....Redfield
Blezek, F. M.....Tabor		Johnson, Geo. E.....Avon	Williams, D. B.....Yankton
Brookman, L. J.....Vermilion		Joyce, E.....Hurley	Wipf, A. A.....Freeman
		Kalayjian, D. S.....Parker	
		Kauffman, E. J.....Marion	

## BLACK HILLS DISTRICT MEDICAL SOCIETY—NO. 9

PRESIDENT		Davis, J. H. . . . . Belle Fourche	Jernstrum, R. E. . . . . Rapid City
Threadgold, J. O. . . . . Belle Fourche		Dawley, W. A. . . . . Rapid City	Mattox, N. E. . . . . Lead
SECRETARY		Doyle, J. L. . . . . Rapid City	Minty, F. W. . . . . Rapid City
Radusch, F. J. . . . . Rapid City		Ewald, Paul P. . . . . Lead	Morsinan, C. F. . . . . Hot Springs
Bilger, F. W. . . . . Hot Springs		Fleeger, R. B. . . . . Lead	Newby, H. D. . . . . Rapid City
Chassell, J. L. . . . . Belle Fourche		Geyerman, P. T. . . . . Hot Springs	O'Toole, T. F. . . . . New Underwood
Clark, O. H. . . . . Newell		Hare, Carlyle . . . . . Spearfish	Pemberton, M. O. . . . . Deadwood
Crane, H. L. . . . .		Hargens, C. W. . . . . Hot Springs	Rogers, J. S. . . . . Hot Springs
..... La Oroya, Peru, S. A.		Howe, F. S. . . . . Deadwood	Stewart, J. L. . . . . Nemo
		Hummer, F. L. . . . . Lead	Stewart, N. W. . . . . Lead
		Jackson, A. S. . . . . Lead	Walters, C. A. . . . . Belle Fourche

## ROSEBUD DISTRICT MEDICAL SOCIETY—NO. 10

PRESIDENT		Carmack, A. O. . . . . Colome	Quinn, R. J. . . . . Burke
Salladay, I. R. . . . . Pierre		Kenaston, H. R. . . . . Bonesteel	Walters, S. J. . . . . Winner
SECRETARY		Malster, R. M. . . . . Carter	Wilson, F. D. . . . . Winner
Overton, R. V. . . . . Winner		Matousek, W. J. . . . . Gregory	

## KINGSBURY CO. DISTRICT MEDICAL SOCIETY—NO. 11

PRESIDENT		Bostrom, A. E. . . . . De Smet	Scanlon, D. L. . . . . Volga
Peeke, A. P. . . . . Volga		Butler, C. A. . . . . Lake Preston	
SECRETARY		Dyar, B. A. . . . . De Smet	
Hopkins, N. K. . . . . Arlington		Irvine, Geo B. . . . . Tempe, Ariz.	

## WHETSTONE VALLEY DISTRICT MEDICAL SOCIETY—NO. 12

PRESIDENT		Flett, Chas. . . . . Milbank	Judge, W. T. . . . . Milbank
Hedemark, T. A. . . . . Revillo		Harris, H. G. . . . . Wilmot	Karlins, W. H. . . . . Webster
SECRETARY		Hawkins, A. P. . . . . Waubay	Peabody, H. C. . . . . Webster
Gregory, D. A. . . . . Milbank		Hayes, C. E. . . . . New York, N. Y.	Peabody, Percy D. . . . . Webster
Brown, A. E. . . . . Webster		Jacotel, J. A. . . . . Milbank	Porter, O. M. . . . . Sisseton
		Jenkins, P. B. . . . . Waubay	

## ALPHABETICAL ROSTER

Abts, F. J. . . . . Yankton	Bates, J. S. . . . . Clear Lake	Billingsley, P. R. . . . . Sioux Falls
Adams, G. S. . . . . Yankton	Bates, W. A. . . . . Aberdeen	Billion, T. J. . . . . Sioux Falls
Ahlf, J. J. . . . . Conde	Baughman, D. S. . . . . Madison	Blezek, F. M. . . . . Tabor
Aldrich, H. H. . . . . Forman, N. D.	Beall, L. F. . . . . Irene	Bloemendaal, G. J. . . . . Cresbard
Alway, J. D. . . . . Aberdeen	Benesh, L. C. . . . . Freeman	Bobb, B. A. . . . . Mitchell
Ball, W. R. . . . . Mitchell	Bigler, Lottie G. . . . . Yankton	Bobb, C. S. . . . . Mitchell
Bartron, H. J. . . . . Watertown	Bilger, F. W. . . . . Hot Springs	Bostrom, A. E. . . . . De Smet

Brookman, L. J.....	Vermilion	Hopkins, N. K.....	Arlington	Overton, R. V.....	Winner
Brown, A. E.....	Webster	Howe, F. S.....	Deadwood	Pankow, L. J.....	Sioux Falls
Brown, R. H.....	Watertown	Hummer, F. L.....	Lead	Parke, L. L.....	Canton
Bruner, J. E.....	Aberdeen	Hummer, H. R.....	Canton	Peabody, H. C.....	Webster
Buchanan, R. A.....	Huron	Irvine, G. B.....	Tempe, Ariz.	Peabody, P. D.....	Webster
Burkland, P. R.....	Vermilion	Jackson, A. S.....	Lead	Peeke, A. P.....	Volga
Burman, G. E.....	Carthage	Jackson, E. B.....	Aberdeen	Pemberton, M. O.....	Deadwood
Bushnell, W. F.....	Elk Point	Jacotel, J. A.....	Milbank	Perkins, E. L.....	Sioux Falls
Butler, C. A.....	Lake Preston	Jenkins, P. B.....	Waubay	Pittenger, E. A.....	Aberdeen
Campbell, R. F.....	Watertown	Jenkinson, H. E.....	Wess. Springs	Porter, O. M.....	Sisseton
Carmack, A. O.....	Colome	Jernstrom, R. E.....	Rapid City	Potter, G. W.....	Redfield
Chassell, J. L.....	Belle Fourche	Johnson, A. E.....	Watertown	Putnam, E. D.....	Sioux Falls
Christenson, A. H.....	Clark	Johnson, G. E.....	Avon	Quinn, R. J.....	Burke
Clark, O. H.....	Newell	Jones, E. W.....	Mitchell	Kademacher, C. J.....	Hoven
Cook, J. F. D.....	Langford	Jones, T. D.....	Aberdeen	Radusch, Freda J.....	Rapid City
Cooley, F. H.....	Redfield	Jordan, L. E.....	Chester	Ramsey, E. T.....	Clark
Cottam, G. I. W.....	Sioux Falls	Joyce, E.....	Hurley	Ranney, T. P.....	Aberdeen
Countryman, G. E.....	Aberdeen	Judge, W. T.....	Milbank	Reagan, R.....	Sioux Falls
Craig, D. W.....	Sioux Falls	Kalayjian, D. S.....	Parker	Rice, D. B.....	Britton
*Crain, F. M.....	Redfield	Karlins, W. H.....	Webster	Richards, G. H.....	Watertown
Crane, H. L.....	LaOroya, Peru, S. A.	Kauffman, E. J.....	Marion	Rider, A. S.....	Flandreau
Creamer, F. H.....	Dupree	Keegan, Agnes.....	Aberdeen	Riggs, T. F.....	Pierre
Crecelius, H. A.....	Lakeport, Calif.	Keeling, C. M.....	Springfield	Robbins, C. F.....	Pierre
Cruickshank, T.....	Vermilion	Kellar, S. A.....	Sioux Falls	Rogers, J. S.....	Hot Springs
Culver, C. F.....	Sioux Falls	Kellar, W. F.....	Sioux Falls	Rohwer, R. T.....	Mitchell
Davidson, Magni.....	Brookings	Kellogg, H. E.....	Brookings	Rowe, A. N.....	Brookings
Davis, J. H.....	Belle Fourche	Kelly, R. A.....	Mitchell	Salladay, I. R.....	Pierre
Dawley, W. A.....	Rapid City	Kenaston, H. R.....	Bonesteel	Sarchet, G. A.....	Mobridge
De Vall, F. C.....	Garretton	Kenney, H. T.....	Watertown	Saxton, W. H.....	Huron
Delaney, Wm. A.....	Mitchell	Kimble, O. A.....	Murdo	Saylor, H. L.....	Huron
Donahue, S. A.....	Sioux Falls	King, H. I.....	Aberdeen	Scallin, P. R.....	Clark
Doyle, J. I.....	Rapid City	King, Owen.....	Aberdeen	Scanlon, D. L.....	Volga
Dugan, Thos. A.....	Wagner	Klima, H.....	Tyndall	Sewell, H. D.....	Huron
Duncan, Wm.....	Watertown	Koren, Finn.....	Watertown	Sherwood, C. E.....	Madison
Dyar, B. A.....	De Smet	Lamb, H. H.....	Sioux Falls	Sherwood, H. W.....	Doland
Eagan, J. B.....	Dell Rapids	Landmann, G. A.....	Scotland	Shirley, J. C.....	Huron
Eckrich, J. A.....	Aberdeen	Larson, A. J.....	Mobridge	Smith, F. C.....	Yankton
Egan, M. H.....	Sioux Falls	Lockwood, J. H.....	Henry	Sprague, B. H.....	Los Angeles
Erickson, O. C.....	Sioux Falls	Lowe, C. E.....	Mobridge	Stansbury, E. M.....	Vermilion
Ewald, P. P.....	Lead	Lundquist, C. G.....	Leola	Stenberg, E. S.....	Sioux Falls
Faust, J. H.....	Huron	McCarthy, P. V.....	Aberdeen	Stern, M. A.....	Sioux Falls
Feige, C. A.....	Canova	McIntyre, P. S.....	Bradley	Stewart, J. L.....	Nemo
Feleger, R. B.....	Lead	McLaurin, A. A.....	Pierre	Stewart, N. W.....	Lead
Flett, Chas.....	Milbank	Mabee, Don R.....	Mitchell	Stevens, R. G.....	Sioux Falls
Forsberg, C. W.....	Sioux Falls	Mabee, O. J.....	Mitchell	Tarbell, H. A.....	Watertown
Freeburg, H. M.....	Watertown	Magee, W. G.....	Watertown	Taylor, E. B.....	Huron
Freshour, L. L. M.....	Yankton	Malloy, J. F.....	Mitchell	Threadgold, J. O.....	Belle Fourche
Gelber, R.....	Britton	Malster, R. M.....	Carter	Tillisch, H.....	Brookings
Gerdes, O. H.....	Eureka	Martin, H. B.....	Harrold	Tobin, F. J.....	Parkston
Geyermann, P. T.....	Hot Springs	Matlock, W. L.....	Huron	Torwick, E. E.....	Volga
Gifford, A. J.....	Alexandria	Matousek, W. J.....	Gregory	Trierweiler, J. E.....	Yankton
Gillis, F. D.....	Mitchell	Mattox, N. E.....	Lead	Trschetter, J. S.....	Huron
Goldman, E. W.....	Madison	Mayer, R. G.....	Aberdeen	Turner, J. F.....	Miller
Graff, L. W.....	Britton	Meyer, H. C. E.....	Sioux Falls	Twining, G. H.....	Mobridge
Gregg, J. B.....	Sioux Falls	Milan, M. Geo.....	Aberdeen	Van Demark, G. E.....	Sioux Falls
Gregory, D. A.....	Milbank	Miller, Frank.....	Aberdeen	Vaughn, J. B.....	Castlewood
Griffith, W. H.....	Huron	Miller, G. H.....	Spearfish	Waldner, J. L.....	Parkston
Groebner, Otto H.....	Sioux Falls	Miller, H. A.....	Brookings	Walters, C. A.....	Belle Fourche
Grove, A. F.....	Dell Rapids	Minty, F. W.....	Rapid City	Walters, S. J.....	Winner
Hammond, M. J.....	Watertown	Moe, A. J.....	Sioux Falls	Watson, Ernest.....	Aberdeen
Hannon, L. J.....	Hartford	Moore, F. A.....	Yankton	Weishaar, C. H.....	Aberdeen
Hanson, H. F.....	Vermilion	Morehouse, E. M.....	Yankton	Westaby, J. R.....	Madison
Hanson, O. L.....	Valley Springs	Morsman, C. F.....	Hot Springs	Westaby, R. S.....	Madison
Hare, Carlyle.....	Spearfish	Mullen, R. W.....	Sioux Falls	White, W. E.....	Ipswich
Hargens, C. W.....	Hot Springs	Murby, B. C.....	Aberdeen	Whitson, G. E.....	Colman
Harris, H. G.....	Wilmot	Nessa, N. J.....	Sioux Falls	Whiteside, J. D.....	Aberdeen
Hart, B. M.....	Onida	Newby, H. D.....	Rapid City	Willhite, F. V.....	Redfield
Hawkins, A. P.....	Waubay	Nilsson, F. C.....	Sioux Falls	Williams, C. A.....	Doland
Hayes, Clara E.....	N. Y. City	Northrup, F. A.....	Pierre	Williams, D. B.....	Yankton
Hedemark, T. A.....	Reville	O'Connor, T. F.....	.....	Wilson, F. D.....	Winner
Hill, John F.....	Yankton	.....	New Rockford, N. D.	Wipf, A. A.....	Freeman
Hoagland, C. C.....	Madison	O'Toole, T. F.....	New Underwood	Wood, T. J.....	Huron
Hogebom, C. F.....	Bowdle	Ohlmacher, J. C.....	Vermilion	Wright, O. R.....	Huron
Hohf, J. A.....	Yankton	Olson, C. L.....	McIntosh	Young, E. M.....	Mitchell
Hohf, S. M.....	Yankton	Opheim, O. P.....	Sioux Falls	Zimmerman, G. E.....	Sioux Falls

\*Honorary

## The Physician and the Press\*

MR. M. M. OPPEGARD  
*Of the Grand Forks Herald*  
*Grand Forks, N. D.*

I am here to talk for a few minutes on the relationship between the members of your profession and the press. I hardly need tell you that I represent a profession and industry that to you men apparently bears the label "unclean," for your code of ethics, inscrutable to me, has placed a quarantine against newspapers insofar as mention of you individually is concerned.

Yet the newspapers and the physician have a great deal in common. You enter into the life of the individual on a privileged basis, and so, too, does the newspaper. It is welcomed into milady's chamber in the morning; it may lull her to sleep at night.

The attitude of your profession as expressed in your ethics with regard to newspaper publicity is a heritage whose origin many of you are uncertain about, I am sure. In discussing this canon and related phases, it is quite likely I shall appear to be talking in a scolding, critical way. And I shall be.

Now, newspapers feel they are the medium of expression and enlightenment most commonly found in the American home. There were, on January 1 of this year, 1,923 daily newspapers in the United States, having a total circulation of 38,761,187, whereas the 1930 federal census shows there were 29,980,146 families. This means that one and one-third daily newspapers are sold for each family. There is less duplication in newspaper circulation than is generally believed, for all newspapers print essentially the same general news. They vary as to their local news content, of course. In addition to the daily newspapers there are 5,000 weekly, community newspapers, which occupy an important place in the community. To many of you, they constitute your intimate newspaper and they are the ones you are in contact with.

Having thus established the importance of the newspaper as a medium of enlightenment and education, it is difficult for a newspaper man to understand why the press is held in such aloofness, almost horror, by the medical profession.

Newspapers constantly turn to other professions for enlightenment on scientific subjects, but

when they go to a physician to ascertain whether there is any sound scientific basis for the theory, we will say, that cancer is caused by a germ, they find themselves so frequently hedged about with provisos and conditions as to make the effort practically useless.

This brings us again to that canon of medicine which frowns on professional advertising. This apparently has been construed to forbid not merely the insertion of a business card in the newspaper, but any newspaper reference to a particular physician.

Frankly, the press does not understand how a great profession dedicated to the service of suffering humanity can reconcile this role with one in which private business rivalry apparently plays so important a part. It finds the problem the more incomprehensible since medicine has never hesitated to urge upon the press its duties to the public, nor in this connection to suggest the reform of its advertising business.

The average newspaper man tends to think that a rule of professional conduct which sometimes appears to sacrifice the public interest to the private business of the physician is curiously out of harmony, both with the realities of life and with the role of preceptor.

It will never be possible, so long as the question of health remains one of the most interesting and important of human questions, for the practicing physician to avoid contact with his local newspapers, and it ought to be possible for him to get along with them with a minimum of friction and a maximum of usefulness to his community.

Let us consider a few ways in which this usefulness can be expressed most intelligently in contact with the press. First, I think we should refer briefly to the aura of mystery with which the medical profession is surrounded, due entirely to its own manipulations and its own attitude. Newspaper men trained to understand public and human reactions do not see in the medical profession one-half the mystery the medical professions seemingly wants the public to believe is there. We know the hieroglyphics that adorn the average prescription—even though they may

\*Presented at the North Dakota State Medical Association Banquet at Grand Forks, June 1, 1932.

be baffling to the pharmacist at times—simply mean that certain drugs are to be mixed together and put into a receptacle and delivered to the patient. The ratio and kind of drugs used is the combination known to medicine as most likely to afford relief for a condition the physician has concluded exists with the patient. If this conclusion is wrong, there remains the possibility that the medicine will do its work anyway, through the application of a little faith. For the Latin names and ancient measurement signs fill the average patient with awe and respect, although it is sadly true that this same awe and respect sometimes have petered out by the time the patient receives his bill from the physician. There is no charge by me for the suggestion that the prescription be written in plain English and the bill in Latin.

Why not take some of this mystery out of medicine by intelligent publicity? There is no thought to suggest that the individual physician or group of physicians should blatantly advertise their services and ability. But there is the thought that so-called disinterested advertising or publicity on topics of health, possibly conveying in each a catch-line something like this—"Guard your health—consult your physician"—would be worthwhile.

Carefully prepared articles on health, published under the authority of a recognized association of physicians, be it local, district, state or national, could not but prove of benefit to a community. It would be health education.

Only a week or two ago Dr. Fishbein, editor of your national professional journal, addressed the Minnesota state medical convention, and in reply to some suggestions for health publicity, frowned on anything along that line, contending the newspapers should educate the public in health matters just as they do in bridge. I hardly need say that many newspapers do carry health columns that are syndicated, but they cannot meet local conditions, whereas a lesson on bridge is just about as valuable in Grand Forks as it is in Timbuctoo.

Just ten years ago, in 1922, I presented to the national convention of the Association of Life Insurance Presidents in New York, through the offices of one of the largest life insurance companies, a plan for a national bureau of public relations for the insurance companies with a view to educating the public in matters of health and life insurance. The association turned it down, but two years later the Metropolitan Life com-

pany began using that form of advertising and is continuing its use to this day.

It seems to me the physician can well afford to do something along the same line. When possible, publicity of that nature should have local appeal. A community may be threatened with an epidemic of influenza; timely publicity on ways of guarding against contracting the ailment would be a public service. Only in a limited way can the newspapers accomplish this without the full co-operation of the physician; a co-operation sadly lacking at present.

Physicians constantly accuse the newspapers of misquoting them. Some of these accusations undoubtedly are warranted, but many of them, and perhaps all of them, would be avoided by proper co-operation. A physician does not wish to be quoted on a case. He tells the reporter, generally not versed in medicine, of course, that such and such a condition obtained, sometimes in very technical language. The reporter, translating this to the newspaper tongue, may come to a wrong conclusion. He realizes direct quotations cannot be used, except in rare instances, for he has no one to quote directly, except a rather uncertain individual known as the "attending physician." Quoted directly he would have to use the physician's language, and under present procedure, his story probably would be deleted, for the city editor, finding the phraseology over his head, would conclude quite properly that the average newspaper reader would only be confused rather than informed.

I do not mean to infer that the doctor's handling of a case is public property, but when the patient is of sufficient importance to the readers of the specific newspaper involved to warrant extensive comment, the condition of that patient becomes a matter of public concern and the function of the newspaper quite properly enters. It should be to the interest of the physician and the patient to see that the public is intelligently informed. To say that a person's illness is only his own affair and cannot concern the public would be correct if we had no interest in our fellowmen. It is not mere curiosity—it is genuine interest in a majority of cases. Carried to an extreme, we might argue that it was a man's own concern if he committed suicide, for he has only destroyed himself.

Besides the suggestions I have made—if my criticisms may be termed suggestions—there are several other ways in which the press may be used to the advantage of your profession. It

seems proper in this connection to point to an experiment now under way in our neighboring city of Crookston, Minn. There a number of physicians—nine or ten, I believe—are underwriting the expense of a series of ten or twelve weekly advertisements in the daily newspaper, urging that patients pay their doctor bills. There is no signature used, simply the advertisement stressing the thought that the public should play fair with its physicians—that credit is a courtesy, whose continuance can only be warranted by proper treatment of this courtesy. I am told the series is bringing results, for it has prompted many men under obligation to a physician to

realize it takes money to keep the doctor going, just as it does any other profession or industry. One other thing, too, I think the doctors in reading the series themselves each week are reminded that being good business men is not a violation of their ethics.

I feel that I have said my say. I cannot hope for agreement with all I have said, but I am confident the time is coming in the not too distant future when physicians, knowing they are dealing with people, will turn to a medium whose sole operation is for the enlightenment and entertainment of these same people through daily contact.

## Social Insurance Undermines National Character

EDWARD H. OCHSNER, M.D.

*Chicago*

Parasitism is today the corroding canker of modern civilization and anything which favors its growth and dissemination should be unequivocally condemned and most vigorously opposed.

The proponents of Compulsory Health Insurance or National Insurance, as it is called in England, reiterate again and again that these and the dole are totally different. In name and administration, yes; in effect, no. They both encourage people to want something for nothing or much for little, which in effect makes parasites out of them. Almost endless illustrations supporting the statement that Compulsory Health Insurance and the dole are alike in effect could be produced but one will have to suffice. Liek, in his book, recounts the following experience he had while a Krankenkasse physician in Germany. A middle-aged man came to him for an examination with the view of securing sick benefit. Liek examined the patient carefully; could find nothing the matter with him; in fact, found him an unusually well-developed and robust individual. He told the man the facts and elicited the following story. The man told Dr. Liek that he was the only man in his village that did not get some kind of a government stipend, sick benefit or dole or pension and that everybody was ridiculing him because of this.

No one who is at all familiar with Bernard W. Shaw's writings will ever accuse him of being in favor of the present economic system in England. He has the following to say about the dole: "The Labor Party has just twisted conditions all around. They taxed people who live on unearned income, and create their own leisured class—people who live on the dole. The dole is not much but if you have four or five in one family living on the dole you have a hostel of leisured people living very well. That must cease."

The whole Social Insurance scheme is based on the

ethically indefensible theory that individuals are entitled to things that they have not earned and on the politically unsound doctrine that society owes every citizen a comfortable living whether or not he repays society by doing his fair share of the world's work. Under Compulsory Health Insurance the individual who works only half-time is entitled to just as much free medical service and is likely to get much more in sickness benefits than he who works full time. Not only this; it actually encourages immorality and riotous living, as the following personal experience well illustrates. As a young man I worked two seasons in a lumber camp. The camp in which I lived comprised between thirty-two and forty men. Of this number only one did not use intoxicating liquor; only two did not use tobacco; and half of the men spent their hard-earned wages either at the saloons in the nearby town or went regularly to the Island or did both. Those who are familiar with the Islands of the upper Mississippi River need no explanation as to why they went there. I wonder how Health Insurance, insuring these men for loss of time and providing free medical care for them, would have prevented their doing the very things which were the cause of much of their sickness. For my part, I believe that a larger percent of them would have gone to the Island if they had felt that they would be protected against loss of time and that they would receive free medical care if they became sick. Health Insurance would actually have increased not only sickness but immorality as well in this camp.

A recent survey of five thousand students at the University of Minnesota found only ten, or two per thousand, with positive Wassermans. Careful surveys in various parts of the country indicate that about three per cent, or thirty per thousand, of the general population of the United States is syphilitic. A Wasserman

examination of three thousand prisoners in the Southern Illinois Penitentiary revealed the fact that three in ten, or three hundred per thousand, were syphilitic. This same ratio undoubtedly pertains to the class most criminals come from and raises the average in the general population.

It is a well-known fact that alcoholics and those suffering from venereal diseases are much more liable to loss of time from sickness than are those not so affected. What right has any just government to take of the earnings of the two first groups without their consent and give them to the third group? A just and humane government protects the weak from oppression and exploitation by the strong and unscrupulous; but a just and wise government does not penalize the strong, industrious, clean-living and thrifty and favor the weak, lazy, shiftless and immoral. Giving the weak, lazy, and shiftless undue advantage over the strong, industrious, and thrifty actually penalizes and handicaps the latter, interferes with the law "of the survival of the fittest," and must eventually lead to race degeneracy. If the white race persists in this course long enough, the "yellow peril," so often glibly and jokingly mentioned, may become a real menace to western civilization.

All independent writers on the subject state, and even the proponents of Compulsory Health Insurance have to admit that it has tremendously increased occupational neuroses, and that is just what was to be expected and was expected by those who know human nature and can see just a little further than the ends of their noses.

The following quotation from a paper by William H. Hicks is pertinent: "In accident cases, where the question of compensation is involved, conditioned reflexes are sometimes created by the patients' environment that not only retard recovery but instigate additional symptoms; or may lay the foundation for successful malingering."

One of the worst features of Compulsory Health Insurance is that if continued long enough it will crush out of character the three capital I's—Independence, Industry and Integrity. Such schemes are as Guglielmo Ferrero, the eminent Italian historian, rightly says, "artificial," and "While they tide over trifling evils of the moment, they lay up for the future troubles and difficulties and dangers of infinitely greater gravity."

Someone has said, "Happy is the nation that has no history." Whoever said this probably had in mind the old type school history text books which contained little besides records of military campaigns, revolutions and international wars. Viewed from that standpoint the epigram was unquestionably true. Today a more suitable epigram would be—Happy is the nation that has no need for charitable organizations or devices. The ideal society would be one in which every individual can and does secure a decent living for himself and those dependent upon him by the "sweat of his brow," or by mental exertion, or, what would be better still, by the application of both brain and brawn.

There is no fundamental difference between outright

charity and social insurance; both undermine character; both have a tendency to pauperize the citizen, for both rob the individual and his self-reliance and his enthusiasm and his urge for industry; they both penalize the honest, frugal and industrious and favor the lazy shifters and immoral because they inevitably favor the unfair and inequable distribution of the results of labor; both encourage malingering and favor neuroses; both often give something for nothing or much for little, which is the basis of parasitism, and both delay the ultimate goal when every man shall reap the fruits of his labors.

The man who once accepts charity, particularly if it is not a case of dire necessity, is not quite so fine a man as he was before. He has lost something that nothing can replace. War, pestilence, or general disaster may reduce anyone of us to want and penury and then there is no disgrace in accepting aid from our fellowmen; but under ordinary circumstances no able-bodied individual with fair intelligence and health has any moral right to that which he has not honestly earned.

The proponents of Compulsory Health Insurance will undoubtedly say that it was with the view of saving men and women from the stigma of being paupers and the evil effects of pauperism that this and other phases of social insurance were brought forward. Exactly, but what has actually happened they did not foresee. As is so generally the consequence when a law is enacted on an emotional basis instead of on sound reasoning and adequate experience, an element was introduced even worse than pauperism; besides, pauperism was not relieved nor even mitigated.

There are two distinct types of paupers. The mentally and morally subnormal who are not in any way injured by the stigma of pauperism and who still remain paupers because no Compulsory Health Insurance law so far devised includes or can include them. They are the "unemployables" whom industry cannot use. The second class are old people who in their youth have been lazy or extravagant, or who have lost their savings through poor investments. Those who have been lazy and extravagant are simply reaping their just reward and have no one to blame but themselves and it is morally wrong for the government to tax the thrifty and industrious for their support except in almshouses. The way to deal with the problem of the investment sharks is to teach the pupils in our high schools something about investment and to hang the gold brick and non-secure security salesmen, or if this is too drastic devise some other way of putting them out of business.

Compulsory Health Insurance has simply added parasitism to pauperism. The effect upon the insured and upon the public in general is almost as bad as it is on the medical profession. It encourages malingering and deception; it puts a premium on sloth and shiftlessness and a penalty on industry and integrity and thrift; it robs industry of its just reward; and it encourages parasitism.

One of the first effects observed after its introduction in Germany was the changed attitude of a large group of the insured. Before the law went into effect, patients came to their physicians for the relief of real ailments; after it went into effect an ever-increasing number came with imaginary and simulated ailments for the purpose of getting the sick benefit stipend or free hospital care. The latter was particularly the case in the fall of the year when many came complaining of things that were difficult to diagnose and hence difficult to exclude such as spinal concussion, neuritis, and vague abdominal pains. As time has passed this abuse has gradually grown to appalling proportions as the following statistics indicate. Dr. Potts of Oak Park cites the following:

In a check-up in Brawnschweig, two thousand eight (2,008) people on the sick list were asked to report for a check-up examination. This induced eight hundred sixteen (816) to report for work at once, two hundred eighty-nine (289) were found fit for work and only nine hundred three (903), or less than forty-five (45) per cent of those receiving sick money, were actually sick. The proponents of Compulsory Health Insurance will undoubtedly say—this is an individual instance. But not so. This abuse is so almost universal that it is seriously affecting the general honesty of the rank and file of the citizens of those countries where it has been in operation the longest. Social insurance is one of the major factors which has brought Germany to the very verge of economic ruin, and worse than even that—it is undermining the fundamental honesty and moral integrity of the German citizen.

### BOOK NOTICE

BIOCHEMISTRY IN INTERNAL MEDICINE, by Max Trumper Ph.D., and Abraham Cantarow, M.D., with a foreword by Elmer H. Funk, M.D. 454 pages with illustrations. W. B. Saunders Company, 1932. Cloth, \$5.50 net.

In this volume the authors have bridged the gap between abstract biochemistry and clinical medicine; presenting the limitations and significance of biochemical findings relative to the problems commonly encountered in clinical medicine. The normal and abnormal metabolism of carbohydrates, proteins, cholesterol, chlorides, calcium, phosphates, and oxygen is presented with a chapter on the acid-base balance. Then follow chapters on diabetes mellitus, renal, hepatic, gastric, and pancreatic function; studies on pregnancy, cerebrospinal fluid, transudates, exudates, the rarer urinary findings and finally a summary of the diagnostic features of various diseases: all of which are presented in clear cut, easily understood statements, well printed on good paper. This handy volume should appeal to all practitioners who wish to acquaint themselves with all that is of proven worth in this particular field.

A. W. DAHLSTROM, M.D.

TROPICAL MEDICINE IN THE UNITED STATES, by Alfred C. Reed, M.D. Prof. of Tropical Medicine, the Pacific Institute of Tropical Medicine within the George Williams Hooper Foundation for medical research of the University of California. Philadelphia, J. B. Lippincott Co., 1930. 410 pages, 60 illustrations.

Tropical Medicine by Alfred C. Reed of the University of California is a most satisfactory compendium on the subject for physicians living in a temperate zone. The importance of tropical diseases in non-tropical areas is stressed. It cannot be stressed too much. The chapters on Protozoal diseases and on Worms are excellent. The author mentions mycotic splenomegaly. That there is such an entity is questioned very much in certain quarters.

The information packed away in this little volume makes it a handy reference for the doctors in temperate climates.

H. L. ULRICH, M.D.

THE HEALING CULTS. A study of Sectarian Medical Practice. Its extent, Causes and Control, by Louis S. Reed, Ph.D. The University of Chicago Press, Chicago, Illinois. Price, \$2.00. (Publications of the Committee on the Cost of Medical Care: No. 16.)

In the course of its research into the economic aspect of medical practice the Committee on the Costs of Medical Care has accumulated a considerable amount of information regarding the workings of the various activities which exist outside the pale of regular medicine. This data has been epitomized and tabulated and is now issued in booklet form, this being publication number sixteen of the Committee. Its scope is well and tersely set forth in the Introductory Note, which states that "in this document a report is presented which summarizes for the country as a whole available data on osteopaths, chiropractors, naturapaths and allied groups and certain types of religious healers. For each of these groups, the number, geographical distribution, economic importance, and legal status of practitioners are set forth, as well as the history and development of the healing doctrines upon which each of the cults has been founded. An attempt has also been made to evaluate, as fairly and impartially as possible, the nature and quality of their training and of the services which these practitioners render, and to explain their relations with doctors of medicine."

The work has been well done and is worthy of the attention of those seeking reliable information regarding these matters. It is interesting to note that "the United States has some 36,000 sectarian medical practitioners—about 7,650 osteopaths, at least 18,500 chiropractors, and the like, and some 10,000 Christian Science and New Thought religious 'healers'"; that "California attracts all of these types; there are more sectarians in this state, both absolutely and in relation to population than in any other state of the Union." The amount spent annually by the people of the United States for the services of sectarian healing practitioners is estimated at not less than \$125,000,000.

GILBERT COTTAM, M.D.

THE  
**JOURNAL-LANCET**

REPRESENTS THE MEDICAL PROFESSION OF  
**MINNESOTA, NORTH DAKOTA, SOUTH DAKOTA and MONTANA**

THE OFFICIAL JOURNAL OF THE

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The Minnesota Academy of Medicine

South Dakota State Medical Association

The Soo Railway Surgical Association

The Hennepin County Medical Society

The Sioux Valley Medical Association

North Dakota State Health Officers' Association

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FIFTY-FIRST ANNUAL SESSION OF THE  
SOUTH DAKOTA STATE MEDICAL  
ASSOCIATION

The Fifty-first Annual Session has come and gone. All comments indicate that the scientific program and entertainment were well received and declared a success. The economic depression had its effect on the attendance. Registrations totaled 131, Women's Auxiliary, 27. In summarizing the attendance for the past 12 years, the average has been 159 registered per annual session.

The co-operation of the Watertown District Medical Society was the outstanding factor in the success attained.

The South Dakota Legislature will convene in January of 1933. It is important for all District Medical Societies to acquaint the membership of proposed public health legislative activities.

All the members of the South Dakota State Medical Association also have responsibilities, for the Council as the committee on public policy and legislation are only the leaders and spokesmen for the membership of the Medical Association in this work. If the members of the Association will make contact with legislators and glean information as to the legislators' attitude towards public health and of the rights of the lay citizen to be properly protected in all matters of public health, and send it in personal or other memoranda to the members of the Council or the Secretary, by so doing, the medical men and women of the Auxiliary will be living up to their civic and professional responsibilities.

The Council as the legislative committee will appreciate your co-operation. To be successful as a committee they must have the active support of the members.

J. F. D. C.

INFANTILE PARALYSIS

Since the season is approaching during which outbreaks of epidemic poliomyelitis usually occur, a consideration of this subject seems timely. This disease is no longer looked upon as being rare, and evidence indicates with reasonable certainty that abortive cases of poliomyelitis greatly outnumber those in which definite paralysis develops, and the prevalence of immunity against infantile paralysis noted for our adult population has been attributed to mass immunization of children by unrecognized subclinical attacks of the disease. Epidemiologic studies by Kramer and Aycok of the virucidal power of serum, however, indicate that this immunization process takes place more or less continuously throughout the year, rather than occurring entirely during epidemic periods. As a result of this immunization process, the serums of a large percentage of family contacts, normal adults and older children possess the ability to neutralize the poliomyelitis virus in vitro, and according to Shaughnessy, Harmon and Gordon, the power of normal human serum to inactivate the virus may exceed that of serum from persons who have recovered from an attack of the disease. If the assumption that the therapeutic value of such serums probably parallels its virus neutralizing power is correct, the observations of Shaughnessy et al., indicate that urban and isolated rural communities alike, have available at all times in their respective normal adult population an adequate reservoir of immune serum for use when need for it arises. Thus in emergencies, where pooled convalescent serum is not available the administration of blood or serum taken from one or more normal adults and given to the pa-

tient during the preparalytic stage of the disease may prove of great therapeutic value.

Fortunately, as pointed out by Aycock and Luther, poliomyelitis often can be recognized before paralysis develops. In this preparalytic stage of the disease, which usually is of four days' duration, the prostration and acceleration in pulse rate is out of proportion to the degree of temperature present. The throat is mildly reddened, and the flushed face shows a circumoral pallor. Rigidity of the neck is usually less marked than that commonly seen in meningitis, and permits tilting of the head on the neck but resists bending of the neck on the shoulders. As a result the head can be flexed about half way forward before the child complains of pain. The most constant, striking and characteristic neurological feature of the preparalytic stage of infantile paralysis is stiffness in the dorsal and lumbar portions of the spine, which prevents the patient from bending forward except at the hips. Attempts to flex the spine frequently give rise to pains in the lumbar region. Kernig's sign usually is not present early in the disease, but the deep reflexes are frequently hyperactive.

When the above symptoms and signs are found a spinal puncture is indicated. The spinal fluid usually is under moderately increased pressure, and may be clear or slightly opalescent. The cell count as a rule ranges between 50 and 300, but may reach 700 to 800, with polymorphonuclear leucocytes predominating early. These cells rapidly undergo cytolysis, thus later in the disease lymphocytes predominate in the spinal fluid.

In the light of our present knowledge, the administration of immune human serum to patients in whom a diagnosis of preparalytic poliomyelitis is made based on the symptoms and clinical and laboratory findings previously outlined seems justified. Let us be on the alert to diagnose and treat these cases before paralysis ensues in an effort to prevent permanent crippling deformities as well as to enlarge by experience the scope of our information regarding the true therapeutic value of immune human serum.

C. A. S.

#### THE TRAGEDY OF EUSTACHIUS

Bartolommeo Eustachio (1514-1574) and Andreas Vesalius (1514-1564) were contemporary anatomists who lived in Rome and Padua respectively and made many important anatomical discoveries during the middle period of the sixteenth century. They were bitter rivals and when Vesalius in 1543 published

his iconoclastic and revolutionary *De Fabrica Humani Corporis* "a work which marks an epoch in breaking with the past and throwing overboard Galenical tradition" he and his doctrines were savagely attacked, not only by his adversary Eustachius but even by his own teacher Sylvius and his pupil Columbus and others. This so angered and embittered Vesalius that he resigned the chair of anatomy in the University of Padua, destroyed his manuscripts and went to Madrid to become court physician to Emperor Charles V until the latter's abdication, then to his successor, Emperor Phillip II. But his *magnum opus* the *De Fabrica* had been published. There was little of absolute originality in it and much error of detail but nevertheless it marked so great an advance over anything that had preceded it that it earned for its author the title of Father of Modern Anatomy, a title which in some degree persists to the present day. Vesalius was thus an opportunist, a fortunate creature of circumstance. Had the tide of fortune gone otherwise than it did with his rival Eustachius the story might have been very different.

Eustachius was professor of medicine in the Collegio della Sapienza in Rome. He was the first anatomist to describe with any degree of accuracy the tube which bears his name. He discovered the tensor tympani and stapedius muscles, the modiolus and membranous cochlea and the stapes. He discovered the origin of the optic and of the sixth cranial nerves, represented in his plates as the corpora olivaria and pyramidalia, the stylo-hyoid muscle, the deep muscles of the neck and throat, the supra-renal capsules and the thoracic duct. He also described the ciliary muscle. In 1552 he finished the plates for his famous *Tabulae Anatomicae*, the first anatomical illustrations wrought in copper. He was unable to publish them, from lack of means, and for 138 years the plates remained either in the family of Pinus, an intimate friend of the anatomist, or buried in the Papal Library at Rome. When discovered they were presented by Pope Clement XI to his physician, Lancisi, who published them with notes of his own in 1714, 162 years after their completion by Eustachius.

The writer of this sketch is fortunately in possession of a copy of the original edition of this remarkable work and in comparing it with the *De Fabrica* of Vesalius he has been struck with the greater accuracy of detail in the work of Eustachius, especially in the delineation of the anatomy of the central nervous system. There

is little room for doubt that but for the unfortunate circumstances of poverty which prevented the earlier publication of these plates the positions of the two men would have been reversed. As it is Eustachius has been conceded a goodly share of posthumous fame, but it did not come during his lifetime nor did he achieve success in a material way. In spite of the fact that he occupied an honorable teaching position in Rome and was personal physician to two Cardinals, Borromio and Roverno, he died in poverty in Rome in 1574.

GILBERT COTTAM

## SOCIETIES

### THE SOUTHERN MINNESOTA MEDICAL ASSOCIATION

This association will hold its annual meeting in Rochester on September 12. The morning will be given over to medical and surgical clinics and demonstrations by the members of the Mayo Clinic Staff, and the afternoon program tentatively is as follows:

"Modern Methods of Caring for the Hard of Hearing"—Horace Newhart, M.D., Minneapolis.

"Report of a Case of Pneumothorax"—R. V. Williams, M.D., Rushford.

"Practical Diets in the Treatment of Diabetes"—A. H. Beard, M.D., Minneapolis.

"Mediastinal Abscess" case report—H. J. Lloyd, M.D., Mankato.

"Treatment of Congestive Heart Failure"—H. W. Rathe, M.D., Waverly, Iowa.

"Ryerson Operation for Soft Corns."—E. S. Giest, M.D., Minneapolis.

"Hyperparathyroidism"—J. L. Tavenner, M.D., Waseca.

"Convulsions in Adults, From a Neurological Standpoint"—E. M. Hammes, M.D., St. Paul.

"Chronic Anemia with Splenomegaly and Pseudoagranulocytosis" case report—P. A. Lommen, M.D., Austin.

V. J. Schwartz, M.D., Minneapolis. (Subject not reported).

"Further Report on Case of Hypertension"—Charles Koenigsberger, M.D., Mankato.

"Pitfalls in the Diagnosis of Renal Tumors" T. H. Sweetser, M.D., Minneapolis.

## NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Dr. L. J. Happe, Marshall, Minn., was recently married to Miss Marguerite Sanger of that city.

Dr. C. P. Farnsworth, has been elected president of the Chamberlain, S. D., Rotary club of that city.

Dr. A. L. Baker, a pioneer physician of Kasson, Minn., died last month at the advanced age of 80 years.

Dr. Russell J. Moe, Duluth, was recently married to Miss Virginia Mary Palmer, a resident of that city.

Dr. W. G. Workman and family, Tracy, Minn., spent several weeks on an auto tour through the Yellowstone Park.

Dr. I. S. Benson, after an absence of eight years, has returned to Willmar, Minn., and opened offices for general practice.

Dr. L. T. Simons, a recent graduate of the University of Minnesota, has opened offices for general practice at Shakopee, Minn.

At the regular July meeting of the Southwest District Medical Society held at Bowman, N. D., Drs. A. P. Nachtwey, and R. W. Rodgers, of Dickinson, were guest speakers.

Dr. and Mrs. Walter G. Sahr, Hutchinson, Minn., whose marriage took place last month, are touring Europe on their honeymoon, planning to return about December 1, 1932.

Dr. R. C. Ray has purchased the practice of Drs. Aldrich and Allen at Forman, N. D. Dr. Ray is a native North Dakota product, being a son of Dr. R. H. Ray, at Garrison.

At the annual meeting of the McLeod County, Minn., Medical Society, Dr. O. W. Scholpp, Hutchinson, was elected president and Dr. W. W. Klima, Stewart, secretary-treasurer.

Dr. Byron L. Gifford, of Minneapolis, a graduate of the college of medicine and surgery of the University of Minnesota, has become associated with Dr. C. O. Wright, at Luverne, in the practice of medicine and surgery.

The Northwest Medical Society, Minot, N. D., were hosts to a large delegation of doctors, who

spent an afternoon and evening on the golf course of the Minot club. Dr. J. L. Devine, is president and Dr. J. R. Pence, secretary of the golf club.

Dr. and Mrs. Frank T. Cavanor, Minneapolis, recently returned from a two months' stay in Europe. Dr. Cavanor is a member of the Eye, Ear, Nose and Throat staff of the University of Minnesota and devoted part of his time to study in Vienna.

Dr. Charles N. Spratt, Minneapolis, returned from Denver, where he was invited to lecture on "Foreign Bodies" before the Colorado Congress of Ophthalmologists, and show a three reel film of his method of operation on cataract and glaucoma.

The insignia of Commander of the Order of the Crown of Italy has been awarded to Dr. Morris Fishbein, Chicago, editor of the Journal of the American Medical Association, in recognition of his services to Italian medicine and Italian physicians.

Dr. George U. Ivers, son of Dr. M. U. Ivers, of Christine, N. D., who recently received his license to practice in North Dakota and Minnesota, will be temporarily located with Dr. B. T. Bottolfson, Moorhead, Minn. Dr. Ivers is a graduate of Concordia College, the University of North Dakota and Rush Medical College, Chicago.

Dr. Sidney Watson, Worthington, aged 27, died at his home after a brief illness of septic sore throat and heart trouble. He was a graduate of Worthington high school and the University of Minnesota medical school. He was a member of the staff of the Worthington clinic, to which his father, the late Dr. F. G. Watson, belonged.

Dr. C. L. Sherman, of Laverne, was re-elected president of the board of the directors of the Southwestern Minnesota Tuberculosis Sanatorium association, at the annual meeting recently held at Worthington; Dr. C. P. Doland, of Worthington, was chosen vice president, and J. G. Robertson, of Jackson, member of the executive committee. Dr. S. A. Slater was reappointed superintendent.

George Sjoden, 38 years of age, a chiropractor residing at Kensington, Minn., entered a plea of guilty to practicing medicine without a license before the Judge of the District Court at St. Cloud. The defendant had agreed to cure a case of eczema for a fee of \$20. The medicine was to be obtained in Chicago and the patient was promised

immediate relief. Sjoden had previously been convicted of practicing medicine without a license and also admitted to the Court that he had been arrested on two previous occasions for writing checks without sufficient funds. The defendant informed the Court that he is suffering from a severe case of asthma and stated that he would like to go to a different climate. The Judge sentenced Sjoden to eight months in the Douglas County jail and gave him until August 2 to decide whether he would improve his health elsewhere. If the defendant is still present in Minnesota after that date he must serve every day of his sentence.

The Minnesota Medical Alumni Association, following a precedent established three years ago, will hold their annual business meeting and medical program on Friday, October 28, in the Eustis Amphitheater at the University Hospital. This will precede the regular homecoming day and football game scheduled for October 29th. The morning session will be devoted to the surgical specialties. There will be a lunch and business meeting at noon. Internal Medicine, Pediatrics and X-ray subjects will be discussed in the afternoon. The complete program will appear in the October first issue of the JOURNAL-LANCET. Not only Minnesota alumni but all medical men interested are requested to attend this meeting.

The semi-annual meeting of the Border Medical Society was held at the North Dakota State Tuberculosis Sanatorium at San Haven, on May 26, 1932. After luncheon, the meeting was called to order for the scientific program. Minutes of the last meeting were read and approved. President Dr. J. A. Johnson, of Bottineau, discussed a variety of surgical cases, including chest surgery. Dr. David A. Stewart, of Manitoba, spoke on "Tuberculosis Today." Dr. H. E. French, of Grand Forks, discussed the outbreaks of Botulism that have occurred in different sections of our country in the past twenty years. Dr. C. J. Glaspel of Grafton mentioned the epidemic of Botulism that occurred a short time ago in his home town, in which the percentage of deaths was almost one hundred. The Border Medical Society is unique in not having any parent organization, but thrives lustily upon a spirit of international good fellowship and neighborliness. At the close of the meeting Drs. David A. Stewart and H. E. French were unanimously elected honorary members of the society. The next meeting will be held on the Manitoba side, probably at Souris.

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## The Management of Thyrotoxicosis\*

GEOFFREY I. W. COTTAM, M.D.

*Sioux Falls, S. D.*

THE following article is based on a five-year study of some seven hundred cases of thyroid disease seen at Augustana Hospital and the University of Illinois in Chicago, the Wilder Dispensary and Miller Hospital of St. Paul, Minnesota. Although there has been evidence showing Adenomas and Exophthalmics to be different developmental stages of the same process, the following clinical classification of (1) Exophthalmic, (2) Toxic Adenoma and (3) Mixed glands, will be used in this paper. This is done because these definite clinical entities present themselves to the practitioner. My conclusions after this study are as follows:

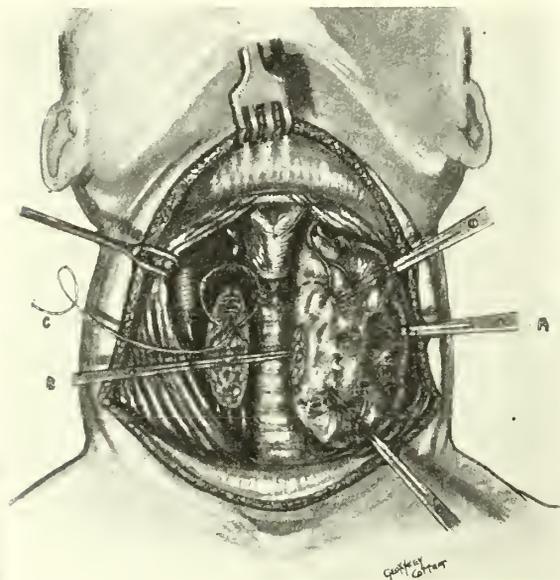
All thyrotoxic cases should have early thyroidectomies after proper pre-operative treatment. A perusal of the histories of the cases who have deferred operation for several years shows (1) that these cases go from doctor to doctor with each successive attack of thyrotoxicosis, (2) that they are subject to long periods of invalidism or inability to work, (3) that one wave of toxicity is almost surely to be followed by others more severe, (4) and that they are poorer surgical risks after repeated attacks when they eventually come to operation. Pemberton calls attention to this. In addition, the visceral damage and the higher incidence of postoperative complications incurred by deferring operation, must be considered. Usual-

ly the case that delays operation is carried through each succeeding wave of toxicity on Lugols and bed rest, by each of their several doctors, but occasionally X-ray, radium and injections are used. It should be emphasized that Lugols, X-ray, radium and injections are but temporary cures for the toxicity and that succeeding attacks will recur subsequently in the largest percentage of cases. An answer to those advocating X-ray as a permanent cure is that too many of their cases treated by X-ray, come to operation in bad condition. *There is an optimum time for operation when the risk is practically nil.* This time is found to be early in the course when the patient has regained, on Lugols, the original weight loss. If such an optimum time is passed by and the patient not operated upon, the risk of operation does increase with each succeeding wave of toxicity. For this reason, carrying a toxic case through pregnancy on Lugols or by other means is not advocated. X-ray, radium and Lugols are used to good use in order to properly prepare a patient for operation but these non-surgical methods should be regarded in this light only. In the case of radium attention should be called to the occasional incidence of Streptococcic sore throat after its use for toxic goitre.

The determination of the optimum time of operation is not judged by the Basal Metabolic Rate although this test has its place in handling

\*Read before the Sioux Falls District Medical Society.

thyroid disease. Most toxic goitres will show marked reductions in the B.M.R. after a week or two of proper Lugolization but that does not signify that the patients are ready for operation. The best single signal of the safest time for operation is the weight curve. The patient is weighed on the same scales once or twice a week. When the original weight loss has been regained on Lugols Solution, or at least within ten pounds of the original loss, the case is about ready for operation. We have never had difficulty in getting our patients to gain weight. One should never operate on a toxic case while it is losing weight. If in addition to the regain of weight, there has been a gain in strength, (gaged by quadriceps strength), a decrease in the pulse pressure and pulse rate, a lessening of the nervousness and dyspnea, the patient is ready for operation. The second best signal of operability is the gain in strength which can be measured each week by steps graduated in height and noting the facility with which the patient increases the height of his steps. It may be said, that if the original weight loss has been regained and the strength has increased, the other signals will usually be favorable.



A. Shows line of marker forceps clamped behind the delivered lobe, on a line dotted to preserve the postero mesial capsule and para thyroids. This forceps is grasped by the left hand and the index finger feels the postero mesial capsule.

B. Shows resecting forceps pointing to the severed ischemic. This line of forceps is placed parallel to the anterior surface of the trachea. The dotted line shows the small pedicle through which the resection is made and such a small surface takes but few forceps.

C. Shows suture reconstructing resected right lobe. Just above the loop of suture the ligated superior thyroid artery may be seen.

*Lugolization*—There is no definite length of time for Lugolization but experience has shown about how long it will take any given case to reach the desired state. Ten to fifteen drops are given in half a glass of milk, water, grape or orange juice, three times a day regardless of the toxicity, but it may be given two weeks or two months depending on the toxicity. The most toxic case unoperated and not in a crisis will not utilize over fifteen drops three times in a day so why give more. In other words, Lugols is given as specified until the cardinal signals of operability have appeared. Lugols is given to Adenomas, mixed glands, and Exapthomlics alike, but the optimum time for operation will come earlier in the Adenomas, therefore it is not given over as long a period of time. Occasionally one will get a very toxic case without weight loss,—usually these are Exopthalmics and I know of no explanation. In such a case, Lugols is given over the same period of time as a case of similar toxicity with weight loss. For the average, this would be about a month. Patients are never put on bed rest except in unusual instances. Where possible, one should insist on Ambulatory Lugolization because rest in bed destroys our valuable criteria of operability, viz.:—gain in weight and strength. Any patient will lose strength in bed and will not gain much weight. A very toxic case may be put to bed temporarily but such a case should not be operated upon until it becomes ambulatory for at least a week. Hospitalization is not necessary and not desired if the patient can gain weight at home. Out of town patients can be sent home to their family physicians until they are ready for operation. If home conditions or severe toxicity interfere with this, they are hospitalized, given a 5000 calorie diet, Lugols and Luminol, and ordered ambulatory as soon as possible. Slight edema of the ankles or fibrillation is no contraindication to their being up and around and as a rule most cases get along very well with only weekly or biweekly office visits to the surgeon or their family physician and do not need to go to the hospital.

*Luminol*—To the average case Luminol grs. ss t. i. d. is sufficient for the nervousness although grs. lss. t. i. d. may be needed. There is a peculiar resistance to morphine in some toxic cases post-operatively—apparently the morphine keeps them awake and they have no trouble if the morphine is discontinued and Luminol supplied.

In addition to Lugols and Luminol, one or

two X-ray treatments may be given before operation, in the severely toxic cases. Radium should be used with care for the reason already mentioned. If a case refuses operation, which is rare, X-ray and Lugols constitute the best alternative.

For preoperative orders, Lugols gtt. xxx and Numbutal grs. 111 is given orally the evening before and the morning of the operation. This larger dose of Lugols is given because an operative can utilize more Lugols than usual. Morphine and Atrophine in proper doses are the only other orders except the omission of breakfast. Very nervous or neurotic patients are put to sleep in their rooms with Intravenous Sodium Amytal.

*Operation*—It makes no difference what technique is used as long as the patient is in the hands of a competent operator. Whether one severs or retracts the sterno-hyoid muscles is a matter of choice. Whether one begins the resection from the outside or at the isthmus, is of no importance. Everyone has his pet method. There should be standardization of the technique chosen because it is conducive to dexterity. Some do not advocate displacing the gland forward because they believe the recurrent nerve to be very vulnerable and easily injured by such displacement. We are not in accord with this view. The gland is delivered forward because retro-laryngeal nodules will be missed if it is not so elevated. Also, we wish to put the gland as far away from the recurrent Laryngeal as possible while resecting the lobes. The work of Hansen at the University of Minnesota has shown that the recurrent is not pulled forward with elevation of the gland unless a nodule has grown behind it in a certain manner. Such an undergrowth must be rare since any enlargement of the gland would tend to cover the nerve instead of growing under it. Even if it has grown behind the nerve, proper rotation of the gland will not displace the recurrent forward. We doubt the high degree of vulnerability which some surgeons claim for the recurrent nerve. It is our opinion that most recurrent injuries are incurred on low lying superior poles rather than at the inferior poles. Again, it is our belief that many transient and some permanent vocal cord injuries are obtained by including the internal branch of the Superior Laryngeal nerve in the upper pole ligature. Nordland's work has demonstrated that the internal branch of the Superior Laryngeal often contains filaments to the intrinsic muscles of the Larynx

and Anosculatory or Anastomosing branches with the recurrent Laryngeal. This internal branch does not solely supply the mucosa of the Larynx as has been supposed, and the recurrent is not the only nerve supplying the intrinsic muscles of the Larynx. Paralysis of the entire superior Laryngeal or its external branch will paralyze in addition the Crico-thyroid muscles and destroy the power of raising or lowering the voice. Since the internal branch of the Superior Laryngeal has an especially intimate relation with the superior thyroid artery and pole, we do not use the upper pole en masse ligature but dissect the vessels clean before applying ligatures to them directly. We put ligatures directly on the vessels, as Kocher advised, for another reason, and that is because they are very muscular and tend to retract. I have seen the superior thyroid artery pull out of a stick-tie (anchored stitch) and cause a superior pole hemorrhage before the patient left the table. If the artery retracts, we want the ligature to retract with it and stay on it. In the en masse ligature after a day or so the strangulated pole will necrose slightly under pressure of the ligature which consequently becomes loose enough to cause a secondary hemorrhage.

After trying a number of standard types of operations, I have adopted the following method:

After a transverse neck incision through the skin and Platysma, the upper flap is reflected with spreading scissors and by wiping with gauze. The use of the knife for this is not advocated because the plane of cleavage is a thin curved line and anyone knows how difficult it is to follow a line with a pencil, much less a knife,—thus getting off the curved line cuts vessels and musses up the field. Next a midsagittal incision is made through the deep Fascia, but avoiding the anterior Jugulars if they are present. This incision is extended upward and downward. The Sterno-hyoid muscles are retracted or divided between curved clamps. A transverse incision is made through the Sterno-thyroids and the vessels of the right upper pole dissected clean and ligatured twice. These vessels are cut distal to the ligatures. The right suspensory ligament is divided between forceps which are removed after being stick-tied. This secures the Crico-thyroid branch of the superior thyroid artery. A Lahey forceps is placed laterally on the right upper pole and laterally on the middle of the body and the entire lobe rotated medially and

forward until the lateral or middle veins to the internal Jugular can be severed between forceps and tied. The degree of mobility of the lobe is remarkable at this point and the lobe is attached dorsomedially by a small pedicle taking but a few forceps for resection. If a lateral vein slips out of the ligature and bleeds it is better to put in a temporary light gauze pack and proceed with the operation rather than dig around for it. Now, the index finger is placed on the side of the posterior edge of the thyroid cartilage but not back of it. The recurrent Laryngeal enters the Larynx at the inferior Cornu. By rotating the lobe medially and forward of this level the gland is kept out of the danger zone. The entire operation on the lobe from this point onward is done above the level of the posterior border of the thyroid cartilage, therefore, one runs the least possible risk of injuring the recurrent Laryngeal during resection. One feels for the Trachea if possible because it is desirable to know whether the Trachea is in the midline or has been pushed to one side, in case an emergency tracheotomy must be performed. However, tracheotomies are seldom necessary on the table but are more often needed later in the patient's room after some edema of glottis has appeared, with or without vocal cord injury. Forceps are placed laterally on the lobe as markers to preserve the posterior capsule and Parathyroids. The isthmus is severed and the Trachea exposed. The lobe is resected from within outward by always applying the forceps parallel to the anterior surface of the Trachea in a straight transverse plane. By pointing the forceps toward the outside row of marker forceps one does not take too much gland. On the other hand, by having the index finger under the posterior capsule one can shave as near this capsule as desired. Although considerable tissue may be removed, the line of resection is through a small pedicle of small area and taking but few forceps. One should never resect through an adenoma, because it leaves diseased tissue behind and hemorrhage is often dangerous. Adenomas should be shelled out. Ordinarily about a level teaspoonful is left as advocated by Ochsner, which amounts to remaining tissue the size of the average man's distal phalynx of the thumb. The postero-medial portion of the gland is thus preserved. This amount varies with the toxicity of the case, of course, and in a very toxic case, one should stop after removal of the right lobe and wait a month with Lugolization before removing the left

lobe. This has proven to be a much safer procedure than superior pole ligation and other methods used in toxic cases. If the case is only moderately toxic, the entire operation is done in one stage.

After removal of the right lobe as outlined, it is the practice of some surgeons to walk over to the left side of the patient for the left lobe. This is unnecessary and it puts one in an awkward position to apply forceps. It is much easier to do both lobes from the right side unless the operator is ambidexterous or left-handed. The left lobe is taken out exactly as outlined for the right. It will now be seen that the forceps on the right lobe are pointing toward the operator and those on the left lobe toward the first assistant. Therefore, the assistant ties the forceps on the left lobe and the surgeon those on the right. If the assistant is not competent to tie knots, it is better to change sides after resection of the lobes and tying the forceps on the right lobe. Changing sides is done solely to tie the forceps on the left lobe. In this connection the advisability of always operating with the same operating personnel or a trained assistant is apparent.

Pyramidal lobes should be removed because they become prominent after the lobes are resected.

It is a nicety and it is more hemostatic to reconstruct the gland at this point by placing a few interrupted sutures to sew the lateral edge of the posterior capsule into the surface of the gland but this procedure is not necessary. After removal of one or both lobes, a sudden change in a toxic patient's condition may make it advisable to loosely pack the wound open with Iodoform gauze. The secondary closure is done after forty-eight hours. Packing the wound is merely a time saver to get the patient back to the room quickly in order to begin supportive and combative treatment. Forty-eight hours is chosen for secondary closure because the danger of crisis is past by that time.

Primary and secondary closure is done in the usual manner but if one has cut the Sternohyoids, we advocate careful hemostatic suturing of the latter rather than tying the ends together because when the patient wakes and swallows, these muscles will pull out of the ties and cause bleeding of the veins. Two small rubber, gauze or gutta percha drains are placed at the angles of the closed wound, rather than in the center and this prevents puckering. We have not used the cautery for excision and only occasionally ligate the inferior thyroid artery.

The average case having a proper thyroidectomy enjoys good health and the post-operative course is calm. However, in very toxic cases, several untoward complications may take place.

*Post-operative*—Usually the patient is up and around on the second or third day and can go home on the fourth or fifth. We have sent them home on the third but do not advise this.

Routinely the toxic case gets Lugols gttc c (100) in 5% Glucose Proctoclysis, Morphine and occasionally steam inhalations. Lugols and Luminol are given orally as soon as practicable. Lugols orally is continued post-operatively for two weeks to a month depending on the toxicity but should not be continued too long as a mild myxedema may follow from thyroid exhaustion. Mosser calls attention to thyroid exhaustion in cases overtreated with Iodine.

The two major post-operative complications to be feared are crisis and superior pole hemorrhage. If a superior thyroid artery breaks loose it is possible for a patient to bleed to death in a short while or cause pressure paralysis of the recurrent. The floor nurse is always instructed where to exert pressure until the arrival of the surgeon if such an event takes place.

Crisis or storm demands forcing of Lugols orally and rectally. A proctoclysis of 5% Glucose c gttc 100% Lugols is kept going continuously. In addition, Lugols gttc xxx is given orally every four hours. If it is vomited it is replaced by the stomach tube.

If the temperature goes above 103.5 the patient is placed on a rubber sheet and the entire body and limbs covered with two hundred and fifty pounds of cracked ice, most of which is banked along the sides. Usually this brings the temperature down in half to three-quarters of an hour. In addition cool water enemas may be given if necessary. I have seen temperatures of 108 reduced by this method and the patients make excellent recoveries.

Auricular flutter and fibrillation sometimes cause distress post-operatively—occasionally Trachycardia. In these heart disturbances the use of Digitalis or other heart drugs is harmful. The cause of the disturbance is the toxicity of the thyroid and the heart will quiet down only when treatment is directed at the cause. Forcing Lugols is the cure.

Other complications are those that may follow any operation with the exception that pulmonary complications (barring a transient

lung edema) are rare. In some five hundred thyroid cases, I have seen but one post-operative pneumonia and one embolism. I am not considering the terminal pneumonia that is superimposed on lung edema from failing circulation.

If there has been some difficult breathing during the operation, a tracheotomy set is placed at the bedside and some person competent to incise the trachea remains near at hand for a day or so. Tincture of Benzoin inhalations will relieve the mild tracheitis that follows some cases. It is a good plan to have the Larynx examined pre and post-operatively by a Laryngologist, especially if the patient has had a previous Thyroidectomy. Collapse of the trachea is rare, most cases of post-operative dyspnea are caused by nerve injury.

*Tetany*—The first signal of this condition is the complaint of "stiffness" or numbness and tingling in the hands. The Chvostek and Constrictor tests are positive. Calcium Lactate grs. xxx t. i. d. orally and 10 c. c. of 10% Calcium Chloride intravenously for the attacks, will mediate the condition. One ampule of Parathormone once every day may be necessary. Viosteral is a very good adjunct. We leave more gland than is necessary and depend on post-operative Lugols. For a case of average toxicity, post-operative Lugols is given for two or three weeks in doses of gttc x t. i. d. If continued longer a mild myxedema may result in moderately toxic cases. In well developed Myxedema Thyroid extract in proper dosage is given.

Pain behind or in the ear or pain in the neck will pass away with dry heat such as that obtained through an ordinary electric light bulb or zoolite and Pyramidon.

Puckering of the wound on swallowing will disappear in about three to six months. Placing the drains in the angles lessens the incidence of this result.

If the nerve supply to the vocal cord has been injured, the patient should be so informed and told that there will be some return of function. This is due to the bridge of scar in the paralyzed cord and the resulting accommodation of the opposite cord. It is often surprising how well the ultimate function becomes. So far I have never had a Tetany or a voice injury but I rap on wood quite frequently. Anyone doing goitre surgery will get a nerve injury at some time or other.

In double vocal cord injury, where it is necessary for the patient to have a permanent

tracheotomy, Frazier has had some beautiful results with nerve Anastomosis. Post-operative B.M.R. is indispensable for prognosis. If the rate is in a range of plus or minus five, one can be sure there will be no recurrence. If plus ten or above, recurrence is probable unless Lugols is continued for some time. One or two X-ray treatments are advisable in most cases of recurrence but, if not effective, reoperation is indicated.

A short discussion of thyroid cases in general might not be amiss. It is advisable to remove large or small cysts even if the metabolism is below normal. A study of cases having a lump in their neck without symptoms, shows that eventually they become toxic and that the vascular system has been damaged. We have had such cases register higher metabolisms after removal of these cysts.

Plummer has called attention to two essential clinical differences between adenomas and exophthalmics, viz:—the former showing predominant cardiovascular symptoms and the latter showing predominant nervous manifestations. Then there are both types occurring in the same gland and having mixed symptoms.

Plummer has also spoken of the so-called goitre facies. Of course, anyone can diagnose a frank exophthalmic goitre, but early toxic cases without exophthalmus, do have a typical facies—it is a restless, hunted look, with a peculiar widening of the eyelids at the outer Canthus and often a flushed face.

Any case with a fibrillation, tachycardia or flutter of unknown cause should be suspected of hyperthyroidism, even in the absence of palpable goitre because substernal adenomas are quite frequent.

Again it is not uncommon for the following to occur. A patient has violent abdominal pain with marked tenderness and rigidity but very little fever. Vomiting is persistent. The pulse is normal or elevated, the patient is slightly nervous or restless, pulse pressure high. This is a typical picture of a pre-operative crisis and too often these patients have a laparotomy for a supposed visceral accident which is not found. If the patient recovers from the crisis after operation, the surgeon classifies the case as a hysteria or Luetic crisis and does not suspect a thyrotoxic crisis until

later. Pre-operative crises are treated the same as post-operative.

Carcinoma of the thyroid is treated like carcinoma of other regions and if there is hyperthyroidism with it the usual goitre medication is given in addition. Metastatic nodules to bone may cause hyperthyroidism. Cases where removal of the bone nodule caused a cessation of the hyperthyroidism, have been known.

Tuberculosis of the thyroid may give hyper or hypo symptoms and is treated accordingly.

Riedel's Struma, characterized by fever, pain and tenderness in the neck, may show hyper or hypo symptoms—usually hypo. Treatment is given accordingly.

Sometimes there is difficulty in determining the diagnosis of hyperthyroidism. This is particularly true when there has been no weight loss and neuresthenic symptoms accompany the condition. The occurrence of the pathognomonic fingernail sign is helpful to distinguish hyperthyroidism, early tuberculosis and neuresthenia. This sign is a concave indentation of the distal part of the nail bed. We have seen this in exophthalmic goitre only and believe it to be reliable when present. B.M.R. is also helpful.

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## Electrocoagulation of Tonsils

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**M**Y APPROACH into this field came through the channel of general surgery. It is estimated that one-third of all surgical operations are tonsillectomies and at least one-half of these are done by general surgeons. Having done several hundred myself, I feel competent to have an opinion on tonsils.

Realizing, many years ago, the seeming inadequacy of ordinary cutting surgery in dealing with malignancies, I early turned to the actual cautery as a possible improvement. As high frequency machines made their appearance, I at once made use of them, and as improvements developed I adopted the new methods the apparatus afforded. So that electrosurgery from its early stages has been in constant use in our surgery for a wide variety of purposes. The effects of the high frequency surgical currents (desiccating, coagulating and cutting) on the destruction of undesirable tissues, such as accessible pre-cancer and cancer lesions, hemorrhoids, cervicitis and cervical erosions, were studied. Being thus acclimated, so to speak, to the electric method it was not difficult to turn our attention to the sterilization and eradication of tonsils.

Electrocoagulation of tonsils is a comparatively new procedure. The first serious attempt in this direction was made by Portman of Bordeaux. William L. Clark, of Philadelphia, whom the American College of Surgeons honored at the 1930 congress, was perhaps the first to use high frequency surgery in this connection in this country. He used it in a variety of conditions, such as superficial malignancies and hemorrhoids as well as tonsils. George A. Wyeth, of New York, did valuable work in this field about the same time, especially in neoplasms.

Powers and Silvers, New York, McFee, of Boston and Dillinger of Pittsburgh have been active in pioneering. Dillinger, perhaps as much as any other person, has been instrumental in popularizing this method. Skillern of Philadelphia and Balmer of Northwestern University are active and enthusiastic in this method of tonsil removal.

Abroad we have Dan McKenzie, of London, who has written a creditable book on the nose and throat, but has one especially devoted to electro-

surgery in upper air passages, in which he strongly recommends electrocoagulation as the method of choice. Collins of London has also ardently advocated electrocoagulation, and I could mention many more men who are using electrosurgery for the eradication of tonsils.

Many confuse the actual cautery, thermocautery, and electrocautery, with electrocoagulation. The processes are entirely different, and the sterilizing and destructive effects are accomplished in a different manner. This distinction must be clearly held in mind, for herein rest the merits of the entire procedure. Ordinary electrocautery as produced by a hot tip of the soldering-iron variety is very superficial in its action, the hot tip cools down almost immediately on contact with the tissues. With high frequency or surgical diathermy, the destructive effect is produced by passing the current through the body and concentrating it with a needle point electrode at the location desired. In this case the heat is generated in the tissues by tissue resistance to the flow. The tip of the active electrode does not get hot, but the structures immediately adjacent dehydrate, coagulated and cooks. There is no carbonization or actual burning.

It is the carbonization factor that makes for the inefficiency of the actual cautery. Immediately the actual or hot iron cautery is touched to the tissues, it chars and burns a thin film. This charring, or carbonization, acts as a nonconductor to heat and electricity. There is an indeterminate zone of undercooking around the coagulated area that is sublethal to fully organized tissue, but still destructive or inhibitory to cancer cells, undifferentiated cells and pathogenic organisms, which are supposed to succumb at a lower heat level than sound, mature, differentiated cells.

It is not my desire here to go into detail regarding indications and technic, but to summarize briefly my attitude on the question.

My entrance into this sphere came about in this way: A mature woman who had been a patient of mine at intervals for more than a quarter of a century, dropped into my office on her way from the throat specialist. She said the specialist had just told her that her tonsils were badly infected and should come out. She told how she dreaded

the operation; how sick many of here acquaintances were after surgical removal, how they suffered while having their tonsils out and for days afterwards, how she dreaded hemorrhage, etc. "Doctor, is there no way out but an operation?" I had been rather successful in getting her through a serious surgical experience, but at that she did not care to repeat it.

I told her that her tonsils were a menace, but that I knew of no other way of dealing with the situation than by the procedure just recommended. This woman was in fair health, although never very robust, but by right living as regards diet, fresh air, exercise, etc., she maintained a fair standard of health. She was rather given to sore throats, sinusitis, colds and bronchitis.

During the consultation I remarked that I had just returned from an eastern trip and had seen some good men treating infected tonsils by electricity, they claimed, with good results. I also dropped the suggestion that inasmuch as we had all the paraphernalia adopted to this kind of work, and trained help in this surgery, that some day when I ran across a proper case I was going to try it out. Without hesitation she said: "You may try it on me right now." I don't know who was most perturbed, myself, my assistant or the patient, but I think I was. But my bluff had been called and I must proceed.

I swabbed the tonsil and fauces with a 10 per cent solution of cocaine, and taking the monopolar terminal off my high frequency machine, I proceeded to desiccate the tonsillar surface. Within a few days I treated the other tonsil. We proceeded very cautiously, of course, and did very little at a time. Improvement was soon noticed. Two or three treatments to each tonsil at intervals of about ten days had so ameliorated her symptoms that we decided to let the matter rest for awhile. The original throat symptoms she presented were sore throat, redness in the region of the tonsils with slight enlargement, and palpable tender glands in the neck. In a year or so the throat again became sore and the neck tender. Having acquired a little more experience, I proceeded actually to coagulate the tonsil remnant, although in the meantime, and with much less efficient treatment, the tonsils had diminished one-half in size.

Actual coagulation is effected by using a milliamperage current, usually of the d'Arsonval which is bi-polar, with the electrode needle placed in the tonsil. The machine is so set that, by stepping on the footswitch for a second or

two, an area is coagulated equivalent to half a small pea or perhaps a grain of wheat. This is done the next week on the other tonsil. As a rule, I allow a two-week interval between treatments on each tonsil. The question is often asked, "Can't you remove the whole tonsil at once?" Yes, but that would leave a sore throat, and, if removal at one sitting is desirable, resort to regulation tonsillectomy is preferable.

The advantages of the electrocoagulation operation (and it is an operation) is that by fractional procedures the tonsil can be just as effectually removed as by the cutting operation, without doing any damage to the throat and without laying the patient up. I have treated many singers, public speakers and teachers without the loss of a single appointment. They keep right on with their daily habits. There is an occasional mild sore throat, but not enough to prevent eating or swallowing, and there is no bleeding. This is the thing that stands out in the minds of most people. So many cases of severe bleeding come to their notice as well as an occasional death, and these act as a deterrent to most people.

The great drawback to electrocoagulation is the frequent visits to the office which are necessary and the repeated applications, three to six, or maybe in exceptional cases eight to each tonsil, over a period of two or three months. Of course there are cases which are cleared up by one treatment or two, but the longer period of treatment is the more common occurrence. However, when we consider that the only time lost is that consumed in coming to the office, and that treatment itself lasts for only a few seconds preceded by a few minutes for anesthesia, this feature loses much of its force. People go to their dentists many times as a matter of course and submit to more pain and discomfort.

With considerable justification the tonsil is regarded as a menace, but only insofar as it is the harbinger of infection, is this true. Lymphoid tissue, of which the tonsil is composed, is the normal lining of a considerable part of the oronasopharynx; viz., Waldeyer's tonsillar ring formed by the two faucial tonsils, the palatine tonsil, and the smaller groups of adenoid follicles at the base of the tongue and behind the posterior pillars of the fauces.

The frequent tendency of infection to recur after tonsillectomy is cogently significant. With this viewpoint in mind it should be readily apparent that it is not the tonsil that is the menace, but the infection in the tonsil; that if the infection is eradicated we will have a better throat

with some tonsil tissue remaining, than with a tonsillar fossa cleaned out down to the muscle, as is often the case. Not only that, but often the pillars are cut away or wounded, and occasionally the uvula suggests a bitter experience. This yawning abyss must necessarily heal up by granulation, and the resultant scar tissue is an object lesson that can be demonstrated in many well-tonsillectomized throats. The result is often a stiff, dry, irritable throat that infrequently produces more conscious annoyance than when the tonsils were in.

With electrocoagulation we can work deliberately, with no bleeding to obscure our vision of the field of operation. No structure is injured except the tonsil, as the coagulated area is under perfect control of the operator. There is no more danger of coagulating too deep, than there is of cutting too deep. It is a matter of meticulous technic.

When the last remnant is to be dealt with, or when the tonsil is of the embedded type, an assistant lifts the anterior pillar, thus allowing complete visualization of the fossa. When we think we are practically through, we advise the patient to go for a month or two in order to allow stabilization of the disturbed area and disappearance of the redness due to the treatment. All patients are urged to come in for inspection for a year, so that any vestiges of apparent infection can be removed.

An article in the *Journal A.M.A.* for October 20, 1928, by Rhoads and Dick, describes a study in which they collated the results of two thousand tonsillectomies. They found that in over 70 per cent of the cases some tonsillar tissue was still present. That the tonsillar stump contained more highly virulent germ and was more toxic than the average infected tonsil, was due in all probability to the involving scar tissue. Fowler in his book on Tonsil Surgery, page 171, sees fit to make an extensive quotation from these conclusions of Rhoads and Dick.

It is becoming generally accepted that the only way to get rid of these infected stumps is by electrocoagulation. Electrocoagulation not only destroys the infected tonsil, but the sterilizing effect of the heat is manifest beyond the zone of coagulation. It has been my experience (and that is true of every other man who has used this method to any extent) that after a few applications, and often after one, the evidence of tonsillar infection subsides. In fact, that is one of the difficulties we encounter. The patient, when

asked as to why he did not continue the treatments would reply, "I am all right; why bother." But on inspection the tonsil would present a less red appearance and was considerably shrunken. Sometimes within a few months it would practically disappear. The explanation was that the infection had been destroyed, and the tonsillar atrophy had followed the natural trend.

Of course the successful removal of tonsils is beset with many difficulties. It is highly technical, and is much more difficult than tonsillectomy, especially in the timid, nervous and apprehensive patient who gags easily and requires much patience. The case of the submerged tonsil, with pillars covering and adherent, presents a real problem. The pillar must be freed, lifted, and the coagulation done behind it. Almost anyone can coagulate a large protruding tonsil, but it is the buried tonsil that is the most difficult. Acute tonsillitis may be aborted by superficial coagulation or desiccation. The heat reaches deeper than any topical application can hope to do. Heat is the best sterilizer.

In addition to acquiring the technic of applying the pointed electrode to the tonsil, the operator must familiarize himself with the agency and apparatus with which he is working. Many have seen the work done a time or two, purchased an outfit and proceeded, with unsatisfactory and occasionally disastrous results. Then they condemn the procedure. The manipulative dexterity is not so difficult, but requires time, work and not a little expense.

It is now seven years since I first began the work, and my first patient is still with me, satisfied with the result. During this time I have treated upwards of fifteen hundred tonsils with approximately ten thousand applications. At first I proceeded very cautiously, taking only such cases as refused tonsillectomy, or were unfit subjects for the surgical removal, such as bleeders, and patients in poor health, but who would be greatly benefitted if their tonsils were out or sterilized.

Now as to ultimate results. I have not taken the time to assemble figures, but have followed the cases up very carefully over all this time and find the results most satisfactory, from the patient's point of view as well as my own. In very few was there dissatisfaction. I think this is very gratifying, considering the great hostility from the profession. In the face of this I made a standing offer to any physician to come in and watch my work, listen to my explanation and fol-

low up the cases if he wished. In the smaller cities like these at the head of the lakes, it is not difficult to follow up cases. In fact, we virtually live with our patients and know what happens to them. Particularly do they let us know

if they do not get along well. Contrast this with the clientele of the cosmopolitan surgeon who may, perhaps, have a larger number of cases to report, but who does not know and has a poor way of finding out what becomes of half of them.

## Diphtheria Immunization by Means of Toxin-Antitoxin and Toxoid Injections

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ACTIVE immunization against diphtheria is no longer a novelty in medical practice, and the value of the Schick test for determining the effectiveness of such prophylactic measures is apparently well established. In this country, the use of diphtheria toxin-antitoxin preparations has proved highly effective, rendering an immunity in from 80 to 90 per cent of children who receive three injections.<sup>1</sup> More recently the use of anatoxin or toxoid has been gaining favor and bids fair to become the preparation of choice for diphtheria immunization, not because of striking superiority of its effectiveness as compared with toxin-antitoxin, but rather for the reason that anatoxin cannot sensitize one to horse serum. Park feels that toxin-antitoxin which contains an exceedingly small amount of horse serum does not sensitize the patient, and has pointed out that if one desires to avoid any conceivable risk of sensitization, toxin-antitoxin mixtures containing goat or sheep serum may be used.

A few years ago one of the authors<sup>2</sup> presented evidence to the effect that toxin-antitoxin sensitizes the recipient to the protein contained in this preparation; and subsequent clinical experience has convinced us that if distressing reactions are

to be regularly avoided, a rather prolonged period of desensitization is desirable in all instances requiring the therapeutic or prophylactic administration of preparations containing horse serum to patients who have previously received toxin-antitoxin injections containing this same protein.

During the past few years the authors have immunized 749 children, (table 1) using three different preparations for this purpose. The majority of the cases inoculated were one year of age. At first, toxin-antitoxin containing horse serum was employed; but after observing several severe reactions in certain of these children following the subsequent administration of other preparations containing horse serum, toxin-antitoxin mixtures containing sheep serum were used to avoid sensitizing these children to the protein present in most of the serums in common use today. Later the toxin-antitoxin containing sheep serum was discontinued, and for the past few months diphtheria toxoid or anatoxin has been used exclusively. The results obtained for each of these three preparations are recorded in Table 1.

Three injections at weekly intervals of 1 cc. each of toxin-antitoxin (0.1 L + dose) containing horse serum were given to 275 children of

TABLE I.

Material Used	Total Number Inoculated	Showing the Materials Used, the Number of Children Inoculated, and the Percent of Negative Schick Reactions RESULT OF SCHICK TEST							
		Percent Negative on First Test	Percent Negative After Re-testing (Total)	First Test at 6 Months Number Tested	Percent Negative	First Test at 7-12 Months Number Tested	Percent Negative	First Test After One Year Number Tested	Percent Negative
Toxin-Antitoxin containing Horse Serum . . . .	275	*(248) 90.2	(266) 96.7	75	(71) 94.7	168	(146) 86.9	32	(31) 96.9
Toxin-Antitoxin containing Sheep Serum . . . .	297	(259) 87.2	(297) 91.9	94	(83) 88.3	171	(150) 87.7	32	(26) 81.3
Toxoid or Anatoxin . . . .	177	(173) 97.7	0	135	(131) 97.0	40	(40) 100.0	2	(2) 100.0
Total . . . . .	749								

\* Actual number of cases in parenthesis.

0 Four positive reactors not re-tested to date.

whom 90.2 per cent had a negative Schick test when it was first applied six to twelve or more months subsequent to immunization. Later, on retesting the positive reactors without further administration of toxin-antitoxin, the negative Schicks increased to 96.7 per cent of the entire group inoculated.

Toxin-antitoxin (0.1 L + dose) containing sheep serum was given to 297 children, each individual receiving three injections of 1 cc. at weekly intervals. Of this group 87.2 per cent had a negative Schick reaction when first tested at different intervals of six or more months subsequent to immunization; and on later retesting, without reinoculation, the per cent of immunes in the group had risen to 91.9 per cent. The data indicate, therefore, that the toxin-antitoxin preparation containing sheep serum was slightly inferior to the mixture containing horse serum in rendering the recipients immune as indicated by the Schick test. The groups studied, however, probably are too small to justify placing much emphasis on this apparent difference in the effectiveness of these two preparations, each of which conferred an immunity (negative Schick test) in a high and satisfactory per cent of the children who received these injections.

Toxoid or anatoxin was given to 177 children, each receiving three doses of 0.5, 1.0 and 1.0 cc. In this series one week intervened between the first and second inoculations, after which three weeks elapsed before the third dose was given. Of the 177 children (table 1) who received the toxoid injections 97.7 per cent had a negative Schick reaction when first tested six or more months after immunization was completed. The results obtained in this limited series of cases indicate, therefore, that toxoid equals and possibly exceeds toxin-antitoxin mixtures, containing either horse or sheep serum, in rendering the individual immune to diphtheria as indicated by a negative Schick reaction. The percentage of negative Schick reactions (97.7 per cent) noted for our group of 177 children who received toxoid injections, is practically identical with that (98.4 per cent) reported by Schwartz and Janney,<sup>3</sup> for 128 children.

Schwartz and Janney used the technique of the Connaught Laboratories of the University of Toronto, giving three doses of 0.5, 0.5 and 1.0 cc., of toxoid respectively at intervals of three weeks; but in spite of the difference in the method of immunization these workers employed, as compared with that used for our cases, the results obtained for the two groups are essentially the

same and the combined data, together with those of Weinfeld and Cooperstock,<sup>4</sup> of G. F. and G. H. Dick,<sup>5</sup> and of Ramon and Helie<sup>6</sup> indicate that toxoid is highly effective in conferring an immunity to diphtheria (negative Schick test) when three injections are given. Whether or not the three-week interval between doses is superior to the method employed in our series of cases is uncertain. The results obtained indicate that within certain limits, at least, the time elapsing between each injection does not modify the final result so far as conferring an immunity is concerned. In our experience, a shorter interval elapsing between the first and second inoculation lessens the frequency with which mothers forget to return for the complete series of three injections.

A further analysis was made of the data with respect to the first application of the Schick test 6 months, 7 to 12 months, and 1 year or more (table 1) after inoculation. For the children who received three doses of toxin-antitoxin containing either horse or sheep serum and who were tested 7 to 12 months subsequent to immunization, the per cent of negative Schick reactions respectively was slightly lower than the percentage of negatives obtained when the first skin test was applied just six months after the injection of the toxin-antitoxin. This was especially true for the group in which the mixture containing horse serum was used. That the high percentage of immunes noted when the Schick test is first applied six months subsequent to inoculation tends to decline later, as indicated by the results obtained on testing 7 to 12 months after immunization, is a point the proof of which requires a larger series of cases than is available in this study.

Among the 749 children immunized against diphtheria, we have observed no systemic reactions, although mothers occasionally reported the occurrence of a slight temporary redness and swelling at the site of injection. This freedom from reactions may be accounted for in part by the fact that very few cases included in this series were ten years of age or older. A few of the inoculated children remained Schick positive on repeated testing. When later inoculated with toxoid, they eventually became negative to the test.

The toxin we employed for the Schick test was discarded four hours after dilution, and a new solution was employed for all cases tested after this interval. When once diluted for use, the vial was kept in a refrigerator to prevent deterioration. These precautions were taken to assure us

that we were using potent material for the test. That diphtheria toxin prepared for performing the Schick test deteriorates rather rapidly after dilution is an inconvenience, and probably is responsible in part for physicians' failure to employ the test routinely after immunization. Recently Bunney<sup>7</sup> has reported that a preparation of toxin in 2 per cent peptone, with 0.85 per cent sodium chloride and 0.5 per cent phenol and adjusted to pH 7.8 to 8.0 maintains a satisfactory stability.

A stable preparation of toxin is now available on the market; and if experience proves its potency to be enduring, the previous inconvenience of using an unstable solution, which must be prepared anew for each group of cases to be tested, is overcome. This improvement no doubt will encourage many to use the Schick test routinely, whereas under previously existing conditions, there was a strong temptation to neglect this method of proving that an immunity had been established.

#### CONCLUSION

On the basis of our experience diphtheria toxoid (anatoxin) equals other preparations in

rendering children immune to diphtheria (Schick negative) following three injections of 0.5, 1.0 and 1.0 cc., the second and third doses being given 7 to 28 days respectively after the first injection.

Toxoid does not sensitize the recipient to serum and in this respect is superior to toxin-antitoxin preparations containing either horse or sheep serum for immunization purposes.

Certain children who have a positive Schick test six months after inoculation, later become Schick negative without further injections of toxin-antitoxin.

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## Laboratory Procedures of Practical Value to the General Practitioner\*

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**A**PROMINENT physician in our state recently told me that he and a colleague had often argued until the early morn, conditions being favorable, over the question of "art versus science" in the practice of medicine. It matters little what side we favor for we must all agree that the great progress our profession has made in the past thirty years is directly due to the developments revealed through laboratory research. This pertains particularly to diagnosis and prognosis, although the discoveries of salvarsan, specific sera, immunizing agents, insulin, liver extract, ventriculin, etc., as therapeutic agents have become valuable aids in the treatment of diseases which formerly were considered almost hopeless.

When those whom we honor as the deans of our fraternity began their practices, little was

known of laboratory methods, and less was attempted by the embryo physician. The few who were alert to the possibilities of added ability in diagnosis and prognosis kept close watch for the reports of new methods being developed, and soon established a technic for performing the simpler tests in their own laboratories. Gradually, as their practices grew, they found this work too laborious and time-consuming, and a nurse was taught to take over the laboratory.

As the need for greater training in laboratory work developed, the so-called laboratory technician sprang into being. She not only supplanted the doctor and nurse as the laboratory worker, but also brought him test after test, the practical value of which he might have doubted and the cost of which the patient often could not bear. But those earlier practitioners who were unable to understand the laboratory's values, or who

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through a distaste for work shunned its burdens, unfortunately neglected to develop any use of or appreciation for the laboratory and the secrets it will often reveal. I am sorry to admit that I have seen a few of my own generation who, in spite of excellent training, have fallen into this pitiable state. As one interested primarily in clinical pathology, I should be expected to be narrow in my viewpoint; but a short experience in general practice soon taught me that the average case could be diagnosed by a careful history and a complete physical examination. No amount of finesse in laboratory technic will ever supplant the proper interpretation of a good history and a careful physical examination in the average case, but it will be of inestimable value in the case which is confused by a seeming antagonism of symptoms and findings.

It seems almost preposterous to stress this subject before a group of modern physicians. However, we have been surprised again and again to see cases that were incorrectly diagnosed when a simple laboratory test would have either established the diagnosis or indicated a possible one. Eye-strain has too often been diagnosed as the cause of headache when a simple blood pressure reading would have detected a hypertension, or a urinalysis revealed a nephritis. Many a patient complaining of weakness, loss of weight, etc., has been told that he was suffering from the effects of the "flu" or that she was undergoing "the change," when a urinalysis might have revealed a diabetes, or a blood examination showed a pernicious anemia. I recall a case of severe cellulitis of the forearm which had failed to respond to treatment and in which a blood examination showed that the patient had a chronic lymphatic leukemia. No amount of explanation on our part could convince this individual that his physician had not been negligent.

I suspect that the physician who rarely uses the laboratory has the idea that it would take considerable time for him to master the technic of modern laboratory methods, and that the cost of equipment would be unbearable. Neither need be true if an attempt is made to use only those procedures which have been proven to be of practical value, and if the amount of equipment is limited to meet the simplest needs.

With this in mind I shall attempt to list the procedures according to systems and in the order of their importance, as we have observed them in our group practice. No attempt to discuss the various steps in the individual procedures will be made as it would obviously be too time-con-

suning, and a better résumé can be found in such texts as Todd and Sanford's "Clinical Diagnosis by Laboratory Methods," or Kolmer and Boerner's "Applied Laboratory Technic." Many tests have been purposely omitted as they were not deemed valuable enough to warrant their use by the general practitioner. Those tests which the writer believes that every physician should have available for his patients are in boldface print, while the more technical procedures (many of which are indispensable in diagnosing a difficult case) of those which of necessity must be done in a well equipped clinical laboratory have been placed in ordinary print.

## I. GENITO-URINARY

### A. Urinalysis

1. **Reaction**
2. **Specific Gravity**
3. **Albumen: (Heat or Acid Test)**
4. **Bile**
5. **Diacetic Acid and Acetone**
6. **Sugar (Benedict's Qualitative and Quantitative)**
7. **Microscopic Examination**
  - a. **Casts**
  - b. **Pus Cells**
  - c. **Red Blood Cells**
  - d. **Stained Smears—Methylene Blue and Acid Fast**

### B. Kidney Function Tests

1. **Concentration Test**
2. **Phenolsulphonephthalein Test**

### C. Hormone Test for Pregnancy

## II. BLOOD

### A. Hemoglobin Estimation—Sahli or Dare

### B. Leukocyte Count

### C. Red Blood Count

### D. Stained Smear (Wright)

1. **Size and shape of Red Blood Cells**
2. **Differential of Leukocytes**
3. **Parasites, Malaria, Etc.**

### E. Blood Platelets, Bleeding and Coagulation Time

### F. Chemistry

1. **Sugar**
2. **Urea**

### G. Serological Examination

1. **Kahn**
2. **Wassermann**
3. **Agglutination Tests for**
  - a. **Typhoid and Paratyphoid Fever**
  - b. **Undulant Fever**
  - c. **Tularemia**

## III. SPUTUM

### A. **Stained Smear for Acid Fast Bacilli**

### B. **Stained Smear (Methylene Blue) for Pyogenic Organisms**

## IV. FECES

- A. Blood—Gross and Occult
- B. Parasites
- C. Microscopic Examination
  1. Stained Smears for Tubercle Bacilli
  2. Ova, Pus and Red Blood Cells
  3. Trophozoite Stage of Endameba

## V. GASTRIC ANALYSIS

- A. Free and Total Acidity

## VI. SPINAL FLUID

- A. Turbidity
- B. Stained Smears
  1. Acid Fast Organism
  2. Pyogenic Bacteria—Methylene Blue
- C. Cell Count and Differential
- D. Globulin and Sugar

## VII. VAGINAL, URETHRAL, THROAT SECRETIONS; PLEURAL AND PERITONEAL FLUID; EXUDATES

- A. Saline Preparation for Detection of *Trichomonas Vaginalis*
- B. Smears

1. Acid Fast Stain for Tubercle Bacilli
2. Methylene Blue Stain—Diphtheritic, Gonococcic and Pyogenic Organisms

## VIII. BLOOD PRESSURE

## IX. BASAL METABOLISM

## SUMMARY

It is the writer's belief that every general practitioner should be able to perform the simpler essential laboratory tests, or should have facilities for having them done. Any patient who has indefinite symptoms and findings should be given a minimum laboratory examination consisting of (1) a complete urinalysis, (2) a blood examination including a hemoglobin estimation, red and white cell counts, and possibly a study of the stained smear, (3) an examination of the stool for blood and parasites, and (4) a blood pressure reading. If less than this is done the accuracy of the diagnosis will be much impaired, the patient will drift elsewhere, and the confidence of the patient in the profession will be shaken (a factor we can ill afford to ignore in these days).

## Proceedings of the Minnesota Academy of Medicine

Meeting of May 18, 1932

THE regular monthly meeting of the Minnesota Academy of Medicine was held at the Town & Country Club on Wednesday evening, May 18th, having been postponed one week on account of the A.M.A. meeting. Dinner was served at 7 o'clock and the meeting was called to order at 8 o'clock by the President, Dr. J. C. Litzenberg. There were 56 members and 2 visitors present.

Minutes of the April meeting were read and approved.

The scientific program consisted of the following:

Dr. H. E. Michelson (Minneapolis) presented a little girl with xeroderma pigmentosum.

Xeroderma pigmentosum was first described by Kaposi. Since then cases have been reported from almost every country. The condition is definitely due to a sensitivity to the sun's rays. After the first exposure to the sun's rays, usually in the first spring of a child's life, a very severe erythema develops. This is followed by a profuse freckle formation and a degree of dermatitis. Some of the freckles become keratotic and gradually warts develop, which eventually become epitheliomas. In the well-developed case there is

to be noted pigmentation, atrophy, telangiectasia, verrucae, and epitheliomas. The prognosis is not good. The epitheliomatous condition causes the exitus.

## DISCUSSION

DR. E. M. HAMMES (St. Paul): If that youngster were kept in the house all the time and out of the sun's rays, would these lesions form?

DR. MICHAELSON: She would have to be kept almost in the dark to avoid enough rays to prevent the condition from progressing.

Dr. F. E. B. Foley (St. Paul) presented the new Foley prostatic excisor, which he has made.

Dr. O. H. Wagensteen (Minneapolis, U. of M.) read his inaugural thesis entitled "Therapeutic Considerations in the Management of Acute Intestinal Obstruction," of which the following is an abstract:

From a pathological point of view there are two kinds of intestinal obstructions, viz., simple and strangulation varieties. In the one there is obstruction of the continuity of the bowel only; the other presents, in addition, vitiation of its blood supply. In many potential strangulation obstructions, such as encirclement of the bowel by adhesive bands, intussusception and volvulus, the

time factor is a significant item in determining whether the treatment will be that of simple obstruction or of late strangulation in which non-viable bowel must be excised. All strangulation types of obstruction, with the single exception of primary thrombosis or embolism of the mesenteric vessels, may, when early surgical interference releases the constricting mechanism, be managed as instances of simple obstruction.

Distention, with attendant loss of vital fluids by vomiting, and interference with absorption from the bowel, is the commanding factor which demands attention in simple obstruction. Decompression of the distended bowel in such instances is life-saving, not because it drains off a potent toxin that threatens the organism, but because it relieves tension and allows of continuance of normal absorption. There is no concrete evidence that indicates that there is abnormal absorption from a viable bowel, though there is considerable proof to the contrary. A strangulated infarcted bowel presents, in addition to obstruction to its continuity, the item of blood loss or hemorrhage into the strangulated segment.

Early diagnosis is of extreme importance in the successful management of all acute abdominal disasters. A large number of instances of bowel obstructions are recognized rather late in their course. No colic of the abdomen, however, is more easily identified than that of the intestine. In a patient complaining of intermittent crampy, colicky pain, attended by nausea and vomiting, the audition with the stethoscope of loud intestinal borborygmi synchronous with the acme of the pain establishes the presence of *intestinal colic*.

It only remains, then, to determine whether the colic is due to mechanical bowel obstruction, enterocolitis, food-poisoning, or to simple "belly-ache." This differential is usually made with ease on the general symptoms present, such as vomiting, diarrhea, malaise, fever, and tenderness. Accompanying intestinal stasis, there is always accumulation of gas in the small intestine, where it is normally not visible in the roentgen film of the adult's abdomen. Visible gas in the small intestine of the adult is synonymous therefore with intestinal stasis. The *stethoscope* determines whether the obstruction is mechanical or adynamic in character.

There are four factors that are commonly observed to contribute to delay in the early recognition of acute intestinal obstruction: (1) Failure to appreciate that obstruction of the bowel is not accompanied by tenderness or rigidity of the abdominal wall (strangulation types

of obstruction, however, with the exception of intussusception regularly exhibit local tenderness); (2) Belief that the expulsion of gas or feces with an administered enema militates against bowel obstructions; (3) Assuaging pain with morphine; (4) The deception of apparently effectual catharsis in partial obstruction.

The remedial agents in the management of acute intestinal obstruction are: (1) saline; (2) transfusion; (3) decompression by nasal catheter suction siphonage; (4) operation.

The keynote of successful therapy of acute intestinal obstruction is early release of the obstruction. In the majority of the clinical varieties of bowel obstruction, recourse is to be had to surgical measures of relief.

Saline exhibits the virtues of a specific only in the high obstructions in the first part of the intestine beyond the pyloric outlet. It does not serve as an antidote for the neutralization of an absorbed toxin; but rather as a satisfactory substitute for fluids lost by vomiting. The blood chemistry alterations that attend "high" obstructions in the experimental animal may be obviated by the subcutaneous or intravenous administration of saline, and the animal's life prolonged for three to four weeks following complete duodenal obstructions by this means alone.

In low obstructions, however, saline is of no special value and does not prolong the life of the experimental animal; neither do the blood chemistry alterations regularly obtain. Too much emphasis has been placed on the value of saline in the treatment of bowel obstruction. Decompression is the most significant item in effective therapy and very few patients can be prepared for operation in acute bowel obstruction by temporization with saline. During the hour following diagnosis, when preparations are being made for operation, saline is to be freely administered, 3,000 to 4,000 cc. being given by the subcutaneous and intravenous routes.

In strangulation obstructions, the blood loss factor may be significant. In instances of intussusception, volvulus or adhesion torsion of the bowel, considerable blood may be lost into the infarcted segment: and blood replacement by transfusion is a great boon to such patients.

A large number of instances of simple obstruction may be satisfactorily decompressed by nasal catheter suction siphonage. Adhesive bowel obstruction is especially amenable to treatment by this method, whether the causative adhesive obstructing mechanism is of recent (postoperative)

or remote origin. Of twelve patients treated for acute simple obstruction of the small intestine at the University Hospital since August, 1931, nine have been satisfactorily decompressed by nasal catheter suction siphonage alone. In the remaining three, enterostomy was done because of the continued persistence of the obstructing mechanism.

The rationale of the method lies in the fact that the chief source of gas in the intestine is swallowed air. Just as the evacuation of the bowel incident to the indirect attack of enterostomy upon the obstruction usually permits the continuity of the intestinal current to be re-established automatically, so drainage from the upper end of the intestinal canal may achieve the same end. The advantage that enterostomy presents over nasal catheter drainage is that feeding may be continued because the drain, in accordance with the logic of good plumbing, is near the obstruction. In the employment of this method, it is essential to follow the decompression fairly frequently by x-ray films to be certain that the distention of the intestine is being accomplished; for the patient usually becomes free from pain incident to the stopping of accretion in intestinal distention soon after the institution of suction. When the distention of the bowel is reduced and gas makes its way into the colon, one knows that the obstructing mechanism has righted itself.

The method is also of value (and was first used in acute mechanical obstructions by the writer to improve the condition of a late case of low intestinal obstruction for operation) in preparing patients with considerable distention for operation in which the cause of the obstruction continues to operate, e.g., stricture of the bowel. It has been employed also in a fairly large number of sub-acute and chronic obstructions to tide the patient over into a non-obstructive phase in which he may then be operated upon, if necessary.

Nasal catheter decompression is not to be attempted in mechanical obstructions in the left colon where the distention is limited by a competent proximal ileocecal sphincter (as shown by the x-ray film) to the colon alone. In strangulation obstructions, also, immediate resort is to be had to surgery.

The most important task the surgeon has to decide when operating for acute intestinal obstruction is the choice of procedure. When dealing with simple obstruction, he should permit himself to be guided by the patient's condition. In early instances he may do the operation of election, viz., locate the obstruction, determine its

nature and establish the continuity of the bowel. In late cases of simple obstruction he should do the operation of necessity, viz., enterostomy. An *aseptic* enterostomy done without spillage, employing a small catheter (14 F) and performed so that it will not leak, may be done in even the late cases with very little risk, and will invariably close itself when the obstructing mechanism below ceases to operate. In strangulation obstructions, the question that must be determined is, "Is the bowel viable?" If not, no matter what the condition of the patient is, the non-viable bowel must be excised. In the majority of instances, it is far safer to exteriorize the devitalized segment and to reestablish the continuity of the bowel by a secondary anastomosis than to do a primary resection with anastomosis.

#### DISCUSSION

DR. J. A. JOHNSON (Minneapolis): I have enjoyed Dr. Wangenstein's presentation very much. There are only two points I wish to stress. For the past ten years I have been using the Rehffuss tube for gastric drainage where there has been postoperative ileus present. This has been very satisfactory. I am sure, however, that attaching the continuous suction apparatus and putting the tube through the nose is not only more comfortable for the patient but more efficient. Dr. Wangenstein mentioned that an enterostomy had the advantage of being able to feed the patient through the opening. I have had instances where I have allowed the Rehffuss tube to pass down into the duodenum and give duodenal feedings. This has been very satisfactory in several cases.

The other point I wish to make is that an enterostomy is of no value in paralytic ileus. The only way that the bowel can be drained efficiently is by its peristaltic movement. When there is no peristalsis, the only part that will be drained is the immediate loop in which the enterostomy is inserted.

DR. WANGENSTEEN (in closing): It is very refreshing to note this interest in the subject of bowel obstruction. There is one comment I should like to make with reference to the contractility of a dilated bowel, which Dr. Johnson mentioned. He undoubtedly had reference to the distended bowel of inhibitive or so-called paralytic ileus, which distention we all know is extremely difficult to deal with therapeutically. However, now and then one hears implied or frankly stated that patients with acute mechanical obstruction fail to get well, despite late attempts at reduction of the distention, because the bowel had been dilated so much and so long that its inherent power of contractility was gone. I am inclined to doubt such an explanation.

All hollow viscera have a great capacity for accommodating themselves to various grades of distention. Unless the circular muscle of the bowel be torn, I rather suspect, if a means for emptying the bowel

(enterostomy or other decompressive measure) is provided, that its contents will be evacuated. It is undoubtedly true that the peristaltic activity of such a bowel is reduced, but I have been impressed to note at operation how an obstructed small intestine with a paper-thin wall, and so dilated that it takes two fairly long rubber-covered stomach clamps to extend across the transverse axis of the bowel for purposes of isolating a loop that can be entirely evacuated to permit of an aseptic enterostomy, will contract down immediately following aspiration of its content.

My experience with conservative decompressive measures in the treatment of peritonitis has been much the same as that related by Dr. Zimmerman. Nasal catheter suction drainage contributes very materially to the comfort of these patients and makes their convalescence easier. I am not agreed with him, however, that ileus or distention is the most significant item in determining whether recovery from peritonitis will occur. It is my impression that persons dying of peritonitis succumb to their peritoneal infection and not to absorption from the bowel.

Much has been written about the present improved results in the treatment of peritonitis over those obtained by our predecessors who were pioneers in abdominal surgery. It is true we have gone far in refinements of diagnosis and surgical technic that contribute to better results. When one considers postoperative peritonitis, however, into the treatment of which these refinements do not enter, he finds that the mortality is just as great as it was forty years ago. Professor Nordmann of the Augusta-Viktoria Krankenhaus of Berlin, in presenting the results of such a study before the German Surgical Congress a few years ago, stated that whereas the results in appendiceal peritonitis were much improved, there was yet no manifest improvement in postoperative peritonitis.

Dr. Litzenberg and his staff at the University Hospital have occasionally called us in to try to do something for the distention not uncommonly attending the sepsis of parametritis and peritonitis following induced abortions. The distention that such patients exhibit is usually refractory to the ordinary means which one employs in dealing with postoperative distention. In past years, I have done a few enterostomies for this condition, but have always been chagrined to see how promptly such patients die, when it seemed that if the distention could be adequately dealt with, the patient might continue on with at least a ray of hope for some time. The gentlest intraperitoneal manipulation in such cases helps to disseminate the infection. Within the past year, Dr. Litzenberg's department referred us two more patients, both of whom were dealt with by nasal catheter suction siphonage alone. One of these was a comparatively young woman with a spontaneous intraperitoneal perforation of a carcinoma of the cervix. She was enormously distended. By employing a combination of nasal and rectal suction we were able to deal satisfactorily with the distention. The patient improved, felt better, and took food again; but

despite effectual decompression, after temporary improvement, she died of her peritonitis.

Though we have gone far in the treatment of local infections of one sort or another, we are almost as helpless today in the treatment of generalized infections as we were in the pre-antiseptic period. There are no known agents that will aid your patient with a bacteremia. The patient must fight out the struggle himself.

DR. J. C. LITZENBERG (Minneapolis): If the Chairman may be permitted a word, I wish to say that while in New Orleans I went one day to the scientific exhibits, and got into just one. That one showed work along the line of Dr. Wangenstein's thesis by Ochsner, which he has as yet not published. I will pay you to watch for its publication for I am sure you will find that work unusually interesting after hearing the thesis of Dr. Wangenstein tonight.

Dr. J. A. Johnson (Minneapolis) reported a case of Meckel's diverticulum causing intestinal obstruction.

Master C. J., age 13, was brought to Northwestern Hospital on August 30, 1925, with an acute abdominal condition. The past history was negative except that he had had an operation for acute appendicitis on February 7, 1924.

The present trouble began two days previous to his admission to the hospital. He was suddenly seized with a severe pain which was referred to the navel. This was soon followed by vomiting. He was given cathartics and enemias without any result. The following day his family physician was called and an attempt was again made to relieve his condition with enemias. No result was obtained and he was, therefore, taken to the hospital for operation.

On examination of the abdomen, it was found to be very distended and rigid; peristalsis was very active, and he was vomiting repeatedly. His pulse was 132, temperature 99°, and W.B.C. 17,500. The urine was negative.

At operation a Meckel's diverticulum was found located about 20 inches from the ileocecal valve. There was a firm fibrous band from near the tip of the diverticulum, attached to the navel. Several loops of the ileum had become twisted about this band and were obstructed. The diverticulum had perforated near its base and the abdomen was filled with thin, slightly purulent fluid. The band was detached, the diverticulum removed, the purulent fluid aspirated from the abdomen, and a penrose drain placed in the pelvis. There was considerable drainage for 48 hours. At the end of five days the drain was removed and the convalescence was uneventful. He left the hospital on the 17th postoperative day.

In August, 1923, I published in *Minnesota Medicine* an article discussing Meckel's diverticulum as an etiological factor in intestinal obstruction, with a report of 3 personal cases. The literature was carefully reviewed at that time and it was evident that nearly two per cent of all mechanical obstructions could be attributed to Meckel's diverticulum. This is my fourth personal case and it seems that Meckel's diverticulum is important enough so that we should keep it constantly in mind. Many authors state that its potential possibilities for trouble are even greater than the appendix.

My reason for reporting this case is to again call this condition to your attention. (Lantern slides were shown.)

Dr. A. E. Wilcox (Minneapolis) reported a case of perforation of Meckel's diverticulum by a fishbone.

The patient, W. F., was a male, age 71. He gave a previous history of a gastroenterostomy for relief of duodenal ulcer in 1909; excision of the gastric ulcer in 1925; and he was then apparently well, except for a postoperative hernia, until his present illness.

On April 8, 1932, he developed pain in the lower abdomen which was not sharply localized, some nausea, but no vomiting. The following morning the pain was more severe, intermittent and increased in frequency of attacks. Diarrhea was a rather marked feature. He was examined by his physician 48 hours after the original pain and, suspecting appendical involvement, the patient was admitted to Abbott Hospital about noon, at which time his white blood count was 13,600, temperature 98.4°, pulse 78, and respiration 18. A diagnosis at 5:30 p.m. was probable appendicitis, and exploration advised. The patient was not entirely convinced of the necessity of operation and requested further consultation and observation. At a 6:30 p.m. consultation, the pain seemed to have moved up to a higher position, a little to the right of the midline. There was some resistance in the right rectus muscle.

At 9 p.m., April 10th, the pain was again more marked and again most marked in the right lower quadrant, with definitely increased muscular rigidity, and the consultants agreed on a diagnosis of appendicitis either simple or combined with other pathology of the colon, the nature of which was unknown, and operation was advised.

On April 10th, at 11 p.m., operation was done

under spinal anesthesia by H.M.C. No. 1. The abdomen was opened through a right rectus incision immediately below the postoperative hernia. No free fluid was noted upon opening the peritoneum. The appendix was easily exposed and appeared innocent; it was, however, removed. The colon was then investigated as high as the hepatic flexure and found negative with the exception of extensive adhesions resulting from previous operations. The ileum was about to be examined when the patient strained (otherwise the spinal anesthesia was satisfactory), and a loop of ileum presented in the operative field, exhibiting a small broad-based Meckel's diverticulum, the apex or greater convexity of which was whitened; and through this area a fishbone protruded into the free peritoneal cavity to the extent of one quarter of an inch.

The pathological problem having been solved, the fishbone was removed and the perforation with surrounding necrotic area invaginated with a purse-string suture of dulox, reinforced with Lambert sutures of the same material. No further surgical procedure seemed indicated and the abdomen was closed without drainage. Convalescence was not markedly stormy; there was a rise of temperature on the second day to 102.4°, leucocytes 23,875, lungs negative; and a progressive decline of temperature to normal on the fourth day. This was followed by no marked difficulties and the patient rapidly recovered, leaving the hospital on the 9th postoperative day.

#### DISCUSSION

DR. MARTIN NORDLAND (Minneapolis): In this connection, I would like to report a case I had three years ago. This young woman, as in the other cases of Meckel's diverticulum, came into the hospital with a diagnosis of acute appendicitis. A mass was felt in the lower right quadrant, by both abdominal and bimanual examinations. She had a low leucocyte count, however. She has a history of a previous abortion, and it was thought this mass might be an enlarged tube. It proved to be a case of Meckel's diverticulum. The diverticulum was invaginated into the ileum from its origin about 18 inches above the valve and, puckering the distal ileum, came down to and through the ileocecal valve.

It has been stated that Meckel's diverticulum exists in about 2 per cent of all people and, according to Halstead, causes about 4 per cent of the obstructions of the bowel.

The meeting adjourned.

R. T. LAVARE, M.D., Secretary.

THE  
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**MINNESOTA, NORTH DAKOTA, SOUTH DAKOTA and MONTANA**

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South Dakota State Medical Association  
The Hennepin County Medical Society

The Minnesota Academy of Medicine  
The Soo Railway Surgical Association  
The Sioux Valley Medical Association

North Dakota State Health Officers' Association  
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### ERYTHEMA NODOSUM

Recently, Dickey, of Leland Stanford University, has called attention to the significance of erythema nodosum in the diagnosis of tuberculosis, particularly, in children. For a long time this condition has been known to be rather frequently associated with tuberculosis. DeStefano reported twenty-three cases among children from three to twelve years. In every case the tuberculin test was positive and markedly so in fifteen; in fact, erythema nodosum is often seen before clinical tuberculosis has been diagnosed. This is particularly true during the period of childhood. Again, it may occur while a clinical case of tuberculosis is under observation and treatment. When this is true, it often indicates an extension of the disease. Therefore, when erythema nodosum appears, whether the patient is one who has always been well or one who has previously suffered from tuberculosis, the physician should make careful observations for a new lesion or the extension of an old one. Erythema nodosum may be accompanied by a fever which persists from a few days to two months; it may be followed by enlargement of the lymph nodes, peritonitis, meningitis, pleurisy with effusion, pericarditis, and tuberculous arthritis. In other cases there are no sequelae.

In a group of cases recently reported by Dickey, now in press in American Review of Tuberculosis, he found that every one reacted strongly to the tuberculin test and in a good percentage of them he was able to demonstrate tuberculous lesions. It has been definitely proved that erythema nodo-

sum may be caused by conditions other than tuberculosis, but it is so frequently associated with a high degree of allergy to tuberculin that one should consider it, when occurring in children, as evidence of a recent tuberculosis or an extension of a tuberculous process until there is definite proof to the contrary.

J. A. M.

### DEPRESSION THERAPEUTICS

There are certain immutable laws that govern economic cycles. Depressions must run their course, pretty much like self-limited diseases, influenced but little by interference.

Pool manipulations "for the advance" serve only as stimulants, that lead eager and inexperienced bulls to the slaughter of bears, who know that a reaction must take place after this artificial device has expended its force, unless true basic conditions have actually changed in the interim. Physicians who know the gullibility of the public in matters medical, should not be over influenced by a sudden "rise," from such temporizing measures.

Monetary inflation may serve a purpose, but, after all, it is but a narcotic, that masks the symptoms and stupefies economic consciousness. A soporific, at best, is only a transient expedient, that in and of itself, cannot be expected to effect a cure.

Someone has said, "we cannot squander ourselves into prosperity." Wreckless spending may be likened to the bleeding of an already exsanguinated patient. Neither can we borrow ourselves out of debt. It is dangerous at all times for an individual to try to get rich on somebody else's money, but never was it more hazardous than now.

When, in the course of the afflictions that have visited the financial world during the past few years, it becomes necessary for physicians to give more thought to the economic side of life, they

must use sane reasoning. If a reserve has been created during "seven years of plenty" and set aside for a rainy day, clouds are robbed of inflicting terror, through prophylactic preparedness, and this is the time to fall back on that blessed emergency fund. On the other hand, if no such provision has been made, there remains but one thing to do; the uncertainty of an uncharted sea lies ahead and that in a storm. A survey from the outlook, as it is, and an inventory of the equipment, should determine whether or not the craft can be expected to weather the gale before it; if not, the course must be changed and sail set accordingly. In other words, *balance the budget*, and patiently await convalescence.

A. E. H.

#### AN IRREDUCIBLE MINIMUM OF MATERNAL MORTALITIES

Many articles have appeared within recent years, in the medical journals, and many statistics have been quoted, drawing comparisons between the maternal mortality rate in the United States and Europe. These comparisons are usually decidedly uncomplimentary to the quality of the service that the average physician practicing obstetrics in this country gives his patients. Such invidious comparisons may, or may not, be just, because they are based upon an extremely variable foundation; namely, the interpretation of statistics which are also notoriously unreliable. A letter, dated July 2, from the London correspondent of the *Journal of the A. M. A.*, quoting from an article in the *Lancet* by Dr. F. J. Browne, Professor of Obstetric Medicine in the University of London, states that in England the puerperal mortality has increased from 3.87 per 1,000 live births in 1911 to 4.40 per 1,000 in 1930; and that deaths from puerperal sepsis, in the same period, had increased from 1.43 to 1.92 per 1,000 births. It appears, therefore, that the experience in England, also, is not entirely satisfactory.

Browne analyzed the causes of death in 173 cases reported by nine maternity hospitals of the highest standing—cases which had had the benefit of prenatal care, and also, presumably, of the best of care at the time of confinement. He concludes that some "meddlesome midwifery" is being practiced, that there are some unnecessary instrumental deliveries and that Cesarean section, which accounted for almost one-tenth of all the deaths, is sometimes performed unnecessarily. Such unnecessary interference certainly accounts for some of the fatalities, but probably compara-

tively few. Some of the patients who died after Cesarean section, for instance, would certainly have died, without operation, from the condition which made operation appear necessary.

Of the entire series of 173 cases, 102 cases, which include those referred to above, were due to causes which the author states "could not have been appreciably influenced by ante-natal care." Nor presumably could their outcome have been altered by improved technique at the time of delivery, with the possible exception of some few cases of "meddlesome" interference already mentioned.

Here, apparently, is a considerable group for which, in the present state of our knowledge, but little can be done. Excepting the remark that "Clinics are not doing all they might to prevent eclampsia," no recommendations are made, nor suggestions given regarding the solution of the difficult problem which this group of cases presents. In a prognostic sense they form a class similar to the degenerative diseases, cardiovascular disease, diabetes and even appendicitis. In spite of enormous additions to our knowledge concerning them, they have resisted all efforts to modify their mortality rate.

The ideal, of course, would be the total absence of maternal mortality and every effort should be made to attain it, but between this ideal and the present mortality rate lies an irreducible minimum which cannot be eliminated.

S. H. B.

### SOCIETIES

Southern Minnesota Medical Association  
Annual Meeting—Monday, September 12, 1932  
Rochester, Minn.

#### MORNING SESSION

ST. MARY'S HOSPITAL

8:00 A. M.—SURGICAL CLINICS (Take elevator in surgical pavilion to sixth floor.)

Surgical Consultants: Dr. W. J. Mayo,  
Dr. C. H. Mayo.

General Surgery (Rooms 3, 4, 5, 6, 7,  
and 8): Dr. E. S. Judd, Dr. J. C.  
Masson, Dr. J. deJ. Pemberton, Dr.  
F. W. Rankin, Dr. C. W. Mayo.

Regional Anesthesia (Amphitheater): Dr.  
J. S. Lundy.

Neurologic Surgery (Rooms 8 and 9): Dr.  
A. W. Adson, Dr. W. McK. Craig.

Orthopedic Surgery (Rooms 1 and 2): Dr.  
H. W. Meyerding.

8:00 A. M.—MEDICAL CLINICS (Surgical Amphitheater). (See further for medical clinics not at St. Mary's Hospital.)

Neurologic Clinic (Sun Room): Dr. H. W. Woltman.

Pediatric Clinic (Meet in St. Mary's Hospital Lobby): Dr. Roger Kennedy.

10:30 A. M.—Gastro-intestinal Clinic: Dr. G. B. Eusterman, Dr. A. M. Snell.

Discussion of Surgical Aspects: Dr. D. C. Balfour.

11:00 A. M.—Peripheral Vascular Disease (Illustrated with Motion Pictures): Dr. G. E. Brown, Dr. E. V. Allen.

11:30 A. M.—Diseases of the Colon: Dr. J. A. Bargen. Discussion of Surgical Aspects: Dr. F. W. Rankin.

Dermatologic Clinic (Seventh Floor North, Clinic Building): Dr. P. A. O'Leary.

Varicose Vein Clinic (First Floor, Desk F-1, Clinic Building): Dr. F. L. Smith.

Otolaryngology (Fourth Floor, Worrall Hospital): Dr. H. I. Lillie, Dr. C. M. Anderson.

Laryngology, Oral and Plastic Surgery (Fourth Floor, Worrall Hospital): Dr. G. B. New, Dr. F. A. Figi, Dr. F. Z. Havens.

8:00 A. M. to 10:00 A. M.—Proctologic Clinic (Seventh Floor South, Clinic Building): Dr. L. A. Buie, Dr. N. D. Smith.

8:30 A. M. to 12:00 M.—X-ray Clinic (Carmen Library, Third Floor, Clinic Building): Dr. B. R. Kirklin, Dr. J. D. Camp, Dr. C. G. Sutherland, Dr. H. M. Weber.

11:15 A. M. to 12:15 P. M.—Urologic Seminary (Second Floor, Desk U-2, Kahler Hotel): Department of Urology.

#### COLONIAL HOSPITAL

8:00 A. M.—SURGICAL CLINICS (Sixth Floor).

Surgical Consultants: Dr. W. J. Mayo, Dr. C. H. Mayo.

General Surgery (Rooms 1, 2, 3, 4, 5, and 6): Dr. Waltman Walters, Dr. C. F. Dixon, Dr. V. S. Counsellor, Dr. S. W. Harrington.

Urologic Clinic: Presentation of Cases (Room 1): Dr. Hugh Cabot.

10:30 A. M.—Transurethral Resection of Prostate and Bladder Neck (Room 1): Dr. H. C. Bumpus, Dr. G. J. Thompson.

Discussion: Dr. Hugh Cabot.

11:00 A. M.—MEDICAL CLINICS (Room 1).

Thyroid Diseases: Dr. S. F. Haines.

11:30 A. M.—Coronary Sclerosis and Angina Pectoris: Dr. A. R. Barnes.

#### LUNCHEON AND BUSINESS MEETING

12:15 P. M.—The luncheon and business meeting will be held in the Kahler dining hall. Presentation of Society Medals to Drs. Herbert Schmidt and L. A. Buie.

#### AFTERNOON SESSION

2:00 P. M.—Plummer Hall, Fourteenth Floor, Clinic Building.

1. Convulsions in Adults, from a Neurologic Standpoint (15 Minutes): Dr. E. M. Hammes, St. Paul.

2. Practical Diets in the Treatment of Diabetes (15 Minutes): Dr. A. H. Beard, Minneapolis.

3. Case of Pneumothorax (10 Minutes): Dr. R. V. Williams, Rushford.

Discussion: Dr. S. W. Harrington, Rochester.

4. Bronchoscopic Problems in General Practice (15 Minutes): Dr. V. J. Schwartz, Minneapolis.

5. Case Report: Mediastinal Abscess (10 Minutes): Dr. H. J. Lloyd, Mankato.

Discussion of Surgical Aspects: Dr. Roger G. Hassett, Mankato.

6. Treatment of Congestive Heart Failure (15 Minutes): Dr. H. W. Rathe, Waverly, Iowa.

7. Pitfalls in the Diagnosis of Renal Tumors (15 Minutes): Dr. T. H. Sweetser, Minneapolis.

8. Case Report: Hyperparathyroidism (10 Minutes): Dr. J. L. Tavenner, Waseca.

Discussion: Dr. R. M. Wilder, Rochester.

9. Ryerson Operation for Soft Corns (10 Minutes): Dr. E. S. Geist, Minneapolis.

10. Case Report: Chronic Anemia with Splenomegaly and Pseudo-agranulocytosis (10 Minutes): Dr. P. A. Lommen, Anstin.

11. Modern Methods of Caring for the Hard of Hearing (15 Minutes): Dr. Horace Newhart, Minneapolis.

12. Further Report on Case of Hypertension (10 Minutes): Dr. C. Koenigsberger, Mankato.

#### BANQUET

6:30 P. M.—Rochester Country Club.

President's Address: Dr. C. C. Allen, Austin.

Remarks: Dr. W. J. Mayo, Rochester; Dr. C. H. Mayo, Rochester; Dr. M. S. Henderson, Rochester (President, Minnesota State Medical Association).

Award of medal to Society member for best presentation at meeting.

Informal dancing will follow the banquet.

#### ANNOUNCEMENTS

Registration for members will be in the Kahler Hotel lobby on Monday, September 12, 1932, from 8 A. M. until 10 A. M.

The scientific program will start promptly at 8 A. M. at the various hospitals as indicated in the program. The afternoon session will be held in Plummer Hall (Fourteenth Floor Clinical Building) and will start promptly at 2 P. M.

The luncheon and business session will be held in the Kahler dining hall starting at 12:15 P. M. Members and their wives will be luncheon guests of the staff of the Mayo Clinic.

The banquet will be held at the Rochester Country Club at 6:30 P. M. Tickets (\$1.50) may be obtained at the registration desk.

A golf tournament for the visiting ladies will be held in the forenoon at the Rochester Country Club. First, second, and third prizes will be awarded and will be presented at the banquet. Send your handicap to Dr. S. F. Haines, Chairman of the Local Arrangements Committee, Rochester.

The Magazine Club will entertain the ladies at a bridge tea at the Country Club in the afternoon. Golf will also be arranged in the afternoon for those who do not wish to play bridge. Transportation will be provided from the Kahler Hotel to the Club.

Members wishing hotel reservations will please write Dr. S. F. Haines, Rochester, indicating the accommodations desired.

The Clinic Bulletin, indicating the operative lists at the various hospitals, may be obtained at the registration desk at 8 A. M.

A permanent exhibit is placed in the reading room of the library on the Twelfth Floor of the Clinic Building. Members of the Association and their wives are welcome at this exhibit.

On account of the length of the afternoon program it will be essential that each member confine himself to the allotted time for the paper or case report. Papers should be ready for publication and left with the secretary following the meeting.

At a recent meeting of the Executive Committee it was decided to award a bronze medal to the member of the Society giving the best presentation at the meeting. The award will be given at the banquet.

H. C. HABEIN, M.D.,  
*Chairman, Program Committee.*

## NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Mrs. E. T. Shaw, the first trained nurse to locate at Fargo in 1888, died in that city on August 10th.

The Wisconsin State Medical Society will hold their annual meeting at Milwaukee, on September 14th-16th.

A new hospital is to be dedicated at Morris, Minn., this month. Miss Anna Emge will be in charge as superintendent.

Dr. W. P. Anderson, formerly located at Anoka, Minn., has moved to Buffalo and will continue general practice.

Dr. C. G. Faune, a recent graduate of the University of Minnesota, has opened offices for general practice at Robbinsdale, Minn.

Dr. John Esser has organized a new clinic at Perham, Minn., with himself as chief surgeon, and a complete staff for all departments.

Dr. John A. Cowman, a recent graduate of the University of Minnesota, has opened offices for general practice at Grand Forks, N. D.

Dr. Paul C. Leck, a recent graduate of the University of Minnesota, has become associated with his father, Dr. C. C. Leck, at Austin, Minn.

Dr. A. M. Kellogg, Dazey, N. D., shot himself through the head and died instantly. Dr. Kellogg had been in poor health for the past year.

Dr. A. M. Limburg, Fargo, was one of the guest speakers at the meeting of the National Fraternal Congress of America, held at Washington, D. C., last month.

Dr. E. O. Voyer, Minneapolis, has recently returned from a two months' European trip. Dr. Voyer attended the annual meeting of the British Medical Society in London.

A school for crippled children will be established at Fargo by the Good Samaritan Society. One hundred thousand dollars has been invested in the purchase of buildings and lands.

Dr. L. F. Johnston, a graduate of the University of Minnesota Medical School, has opened offices for practice at Lamberton, Minn. The doctor served his internship in the Kansas City General Hospital.

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters). William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota, is the speaker. The program for the month of September will be as follows: September 7, "Rheumatic Fever"; September 14, "Baby Teeth"; September 21, "Problem of Drug Addiction"; September 28, "Tumors of the Bladder."

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## Ten Years' Experience with Insulin\*

RUSSELL M. WILDER, M.D., Ph.D.†

*Rochester, Minn.*

A YEAR has passed since the death of the man who blazed the trail that led eventually to the isolation of insulin. Oscar Minkowski was a young man when with von Mering he made his famous discovery forty years ago, but he lived to see its fruition in our time. Its greatness lay not in the discovery alone of the fact that ablation of the pancreas would cause diabetes but the masterly way in which he developed it, so that the group of his papers between 1899 and 1902 contains almost everything of importance relating to the theory of diabetes until the time of active insulin preparation. The existence of an internal secretion was clearly recognized by Minkowski and he was the first to attempt to utilize pancreas in treatment. Succeeding investigators added very little until insulin was prepared in the form in which it is known so commonly today.

About twelve years ago, in November, 1920, to be precise, another young man happened to read a journal article which dealt with the relation of the islands of Langerhans to diabetes. The author was Moses Barron of Minneapolis; the imagination it fired was that of Frederick Banting. The article gave a summary of the degenerative changes in the acini of the pancreas following ligation of the ducts and the idea of Banting was that advantage might be taken of this to prepare

active insular extracts; a subsidiary hypothesis was that trypsinogen or its derivatives was antagonistic to the internal secretion, which would account for the failures of other investigators in this already much-belabored field.

Work began in May, 1921, in the physiological laboratory of Toronto, under the supervision of J. J. R. Macleod and with the collaboration of C. H. Best and J. B. Collip. The first positive result was obtained July 11, suppression of hyperglycemia and glycosuria in a dog from which the pancreas had been removed previously. The first report was made at the Christmas meetings of the Federation of American Societies for Experimental Biology held at New Haven in 1921. The first publication came in February, 1922.

Ten years have passed. Banting is now professor of medical research in the Banting Institute, the gift of a grateful government. Best, then an undergraduate student of medicine, is professor of physiology in the University of Toronto. Within a year after the first announcement, insulin was being manufactured not only in America but in England and on the continent of Europe. Within two years it was being used over the entire world and was everywhere available. Investigations multiplied. A crystalline preparation was obtained by Abel. The literature of the subject has become monumental. The League of Nations has taken cognizance of the

\*Read before the Annual Session of the North Dakota State Medical Association, Grand Forks, N. D., June 1, 1932.

†Professor of Medicine, The Mayo Foundation, and Associate in Medicine, The Mayo Clinic.

necessity for rigid standardization, and has prescribed that the unit of insulin shall conform in potency to one-eighth of a milligram of a stable dry powdered insulin in the possession of the Insulin Committee of Toronto. A diabetic patient can travel where he will today and any insulin that he buys from a licensed manufacturer will be of uniform strength. The Nobel prize was given to Banting and Macleod and divided by them with their associates, Best and Collip. The world knows that diabetes can be controlled and that death from diabetic coma is avoidable.

Samples of insulin were received at the Mayo Clinic in the early spring of 1922. They were for experimental trial and a number of studies were completed for publication in the November-December number of the *Journal of Metabolic Research*, but an adequate amount of insulin to insure everyone getting it who needed it was not available until the autumn of 1922, and October 1 of that year is the date which divides for us the insulin era from the pre-insulin era.

What insulin means to the patient with severe diabetes appears from even the most casual comparisons of our records before and after that date. Allan and Wilder have found it especially impressive in the cases of children. Juvenile diabetes was almost always fatal. It might seem mild at first and careful dietary treatment might prolong life, but the ultimate fate was inevitable and the longest course seldom exceeded four years. We had thirty-two children with diabetes in the Mayo Clinic between October 1, 1919, and October 1, 1922, a three-year period. One was moribund on arrival, twenty-eight received satisfactory training and a dietary that resembled the then popular Allen type of regimen. Nine survived long enough to benefit from insulin. The others died before it came.

Insulin reversed this picture. One hundred and sixty-seven children with diabetes came to the clinic in the first six years after its introduction, and at the end of this longer period 147 were known to be alive; only seventeen had died. The deaths, furthermore, were mostly preventable and might have been avoided had the mother been more alert or the family physician better acquainted with the new treatment. Only one child died in Rochester. This was a patient who arrived in a moribund state, having had the symptoms of severe acidosis for three days and having been in complete coma for twenty-eight hours. The abdominal pains and vomiting caused by acidosis had misled the family physician into thinking the trouble was appendicitis and the urine had

not been examined. The mistaken suspicion of appendicitis is excusable; the failure to test the urine is not.

In the other fatal cases death occurred several months or years after the visit to the clinic. Chiropractors were at fault in some cases, Christian Scientists in others, and the ignorance of certain physicians was responsible for a few. In almost all of these cases insulin had been discontinued because someone objected to its use. An occasional patient still reports that his "family physician does not believe in insulin."

Another group of patients to benefit enormously from insulin are those who require operative treatment. Even minor operations such as the extraction of a tooth is dangerous when diabetes is uncontrolled, and the hazard of a major operation formerly was prohibitive. One of every three patients died in the better hospitals. Since insulin came into use no patient at the Mayo Clinic has been refused an operation because of diabetes, and yet the mortality has been reduced to such a degree as to be comparable and scarcely greater than the average mortality for all surgical cases. Painstaking attention to the details of treatment has resulted in the complete elimination of surgical coma, and the convalescence of these patients, including the healing of incisions, proceeds as normally as possible.

Similarly in obstetrics insulin has helped enormously. The danger of pregnancy in diabetes formerly was incalculable. Professor Meakins, at the San Francisco meeting of the College of Physicians this year, stated that there was no record of a full term pregnancy of a diabetic patient in the Montreal Maternity Hospital up to 1923, although many diabetic women were admitted with acute pelvic infections that had followed spontaneous abortions. The mildest cases might escape the many serious complications, but of these, at the Johns Hopkins Hospital, 25 to 30 per cent died in coma at delivery; infection at delivery caused the deaths of others and the women who survived were found to have more severe diabetes afterward.

The outlook today is much happier. Meakins reported fourteen pregnancies since 1923 with no maternal deaths and seven healthy children. Our experience and that of many others has been equally satisfactory. With good management and the proper use of insulin, maternal deaths from coma or infection ought to be eliminated; if this has not been done everywhere, it is because the medical profession still is insufficiently trained in the use of insulin. The infant mortality, on the

other hand, continues high and the ultimate effect of the strain of pregnancy on the mother's metabolism remains an uncertainty. In several of our cases food tolerance was not affected unfavorably, but in others it has fallen so that larger doses of insulin have been required than formerly. In consequence we are somewhat unwilling to encourage our patients with diabetes in childbearing.

Finally, in the acute infectious complications of diabetes, serious in even the mildest cases, insulin has proved of the greatest value. Pneumonia was scarcely to be survived in former days. Scarlet fever or any of the exanthemas was almost always fatal because the patient's tolerance was lowered to the point at which acidosis and coma were inevitable. Even relatively mild tonsillitis or bronchitis might have fatal consequences. These complications can be combatted now with an assurance of success that is almost, if not quite, as good as with patients not affected with diabetes, but insulin must be used and the dosage required is usually large.

The death rate of patients with diabetes of less than one year's duration was 18.1 per cent from 1891 to 1914. This was the so-called Naunyn period. It was considerably improved in the Allen period from 1914 to 1922 and reduced to four per cent in the Banting period. This is the experience of the Joslin Clinic and includes deaths from all cases including gangrene and heart disease. Deaths in coma were reduced to a minimum. This is what can be done. Unfortunately it is not what is happening in the country at large. The actuarial statistics of the Metropolitan Life Insurance Company portray a very different story and one that is sadly disappointing. The death rate from diabetes actually is mounting and deaths in coma continue so numerous as to constitute 40 to 60 per cent of all causes. Insulin either is not used or is not used properly. It is shocking to hear from patients that their physicians have them come for an injection of insulin once or twice a week, but such reports are all too common. I am reliably informed that the surgical death rate of patients with diabetes of a very large charity hospital is quite as high as it ever was. In Ontario, where insulin is provided free of charge to those unable to buy it, none had been used in 44 per cent of 192 fatal cases of diabetes. In only 12 per cent had it been used with any regularity. This is reported by Defries and Ross. Holcomb's analysis of a smaller series of deaths from diabetes in Oregon showed that insulin had been used by sixty-one patients (54 per cent of the series) at some time during the course of

treatment, but twenty-four patients discontinued it before death and only nine (15 per cent) received it regularly during the course of the disease. This figure lies between that of 12 per cent for the Ontario study and 16.5 per cent for the state of Washington, reported recently by Palmer. Holcomb further observed that only 37.5 per cent of these patients had learned how to test the urine and only 25 per cent how to weigh their food. In other words, only one of two patients with diabetes who died in Oregon used insulin at any time, only one in four used it in the final illness, few were properly trained in their dietaries, and two of every three had not been taught the simple test for sugar without which no one with diabetes can tell when he is safe.

The records of the Metropolitan Life Insurance Company show a drop in the death rate of policyholders with diabetes below the age of fifty, but this is much more noticeable in the large centers of population (New York and Chicago) than it is for the country as a whole. Does this indicate a greater enlightenment of the profession in these centers or the influence of their hospitals? I am inclined to the view that the hospitals are responsible. The treatment of diabetes is admittedly somewhat complicated, and a period in the hospital is decidedly advantageous for initiating a new patient into the complexities of a life of diabetes. Patients learn a great deal from the other diabetic patients they meet in the hospital, and the systematic courses of instruction that can be organized when there are several to be taught are more effective than individual conferences. The diabetic nurse is another institution that should be developed. The Mayo Clinic is prepared to send nurses with special training, who will instruct patients in the home, under the direction of the family physician, and other diabetic centers are able to furnish a similar service. Otherwise the general practitioner must acquaint himself more fully than is usually done with the details of correct diabetic management and be prepared to devote the time necessary to teaching his patients how to keep alive and well. It is not enough merely to avoid coma. Diabetes is not a debilitating disorder when properly handled, and patients with diabetes ought to feel well and strong in body and mind.

Here in the Northwest the incidence of diabetes is as high as it is anywhere in the world. It already approaches that of tuberculosis and the records show it to be increasing. Whether we can prevent the continuation of this increase is doubtful, but we can and must control the hazards

that attend the disease. The last decade has shown both what can be done and what needs to be done. The results obtained in the larger diabetic centers are very satisfactory, but as yet the public at large has not received the benefit it should from the discoveries of Minkowski and Banting.

DISCUSSION ON PAPER OF DR. WILDER

DR. W. H. LONG, Fargo: Has Dr. Wilder any theory regarding the increase in diabetes among older individuals?

DR. RUSSELL M. WILDER, Rochester, Minn.: I do not think that is surprising. Patients with diabetes are living longer, as all people are, because they have more medical attention and take better care of themselves. C. H. Mills, of Cincinnati, is responsible for my statement regarding the increase in diabetes in the Great Lakes area. He claims that it is not extremes of heat or cold that matter but extremes of change. In the central part of the country we have the greatest climatic changes; we are in the direct path of the storms that go from coast to coast. It may be that the same factors account in part for the high incidence of thyroid disease in this area. A large percentage of a population living in regions such as this will develop degenerative diseases.

DR. C. R. TOMPKINS, Grafton: I should like to ask Dr. Wilder whether he finds in these instances that a decreased amount of insulin over a period of time tends toward cure.

DR. RUSSELL M. WILDER: Such cases certainly are seen but they are not frequent, unfortunately. It is possible for the pancreas to regenerate to a certain extent, and we do see patients who are improved, if we judge this by the fact that they require smaller doses of insulin today than they have required before.

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## Tuberculosis Survey in an Indian County in Minnesota\* 1931-1932

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THE incidence of tuberculosis infection in school children has been studied and reported frequently. We now know with considerable accuracy the infection rate in tuberculosis among school children in various parts of the United States and what to expect in the incidence of tuberculosis infection among urban and city children. The various factors entering into and forming the tuberculosis pattern of any one community is now quite well understood.

\*Presented before the Minnesota Trudeau Medical Society, July 9, 1932, at the Minnesota State Sanatorium, Ah-Gwah-Ching, Minn.

There are, however, elements in this problem which have not been sufficiently studied to warrant final conclusions at this time. We propose to present a study showing the association of two races where contact is established chiefly through the public school, the members of one race showing an altogether different rate of tuberculosis infection than that shown by the other. For this reason a study of the incidence of tuberculosis infection in Cass county has been made during the past year to determine so far as possible the prevalence of the infection among

both Indian and white children of school age, to explain such reactors in each case identified by tracing so far as possible their contact with clinical cases of pulmonary tuberculosis in the home. There are three major elements to be considered.

1. The incidence of tuberculosis among the white school children.
2. The incidence of tuberculosis among the Indian school children.
3. The possibility as well as practicability of tracing positive reactors occurring in a school population to contact with reported and unreported clinical cases in the community.

In Cass county there are 92 schools with 4,337 enrolled pupils. During the past school year 260 Indian children were enrolled in 15 of these schools. The mantoux test was applied to 2,096 of the white children reacting positive in 319 or 15.3 per cent of the total tested.

Age	Total Tested	Positive Reactors	Per Cent
Under 5	20	1	.05
5-19	1961	266	13.6
19 Over	115	52	45.2

Among these 319 positive reactors there were 312 chest plates taken. One hundred and twenty-seven showed evidence of hilum disease with calcified glands. Ten showed primary nodes and four gave evidence of parenchymal disease. Among the reactors in three schools careful search was made to trace if possible the infection to an association with an open case of pulmonary tuberculosis in the home.

Pine River School showed 21 positive reactors, and in 19 identification of contact could be determined.

Cass Lake School showed 40 pupils infected, of whom 25 could be traced to association with an open case.

Walker School reported 31 reactors; 23 were investigated and 12 were traced to open cases.

There were 92 positive reactors in these three schools. The source of their infection could be explained through association in 56 cases. Sixty-six per cent of the positive reactors investigated were successfully traced to an association with an open case.

The checking of the contact between the positive sputum case and the non-clinical population through the extensive application of the skin sensitization test will determine our infected areas and define the future measures for control. While

we hope to extend this epidemiological investigation to include all reactors reported, sufficient has been accomplished to demonstrate the possibilities to be anticipated through the continuation of this work.

In Cass county living to some extent apart from the white population but associating with them in school and otherwise there were 433 Indian children of school age who were tuberculin tested and examined. 151 were of pre-school age while 282 were of school age. 246 or 52.8 per cent showed a positive reaction. 40% of those belonging to the pre-school age group reacted positive while 65.6 per cent reacted positive among those belonging to the group of school age.

The X-ray examination of 270 of these reactors showed 144 negative, 118 calcified hilum glands, 15 primary nodes and 8 with parenchymal infiltrations. Lung pathology as revealed through the X-ray is much more prevalent among the Indian than it is among the white children living in the same community and attending the same schools. This increase in parenchymal disease is consistent with the increase in the incidence of tuberculosis infection in the two groups, as indicated by the positive reactors to the Mantoux test. Tracing the positive reactor to its source can be done in practically all of the Indian cases. The failure to trace such sources falls from 34 per cent among the whites to less than 5 per cent among the Indian children.

One hundred and eighty of the 260 Indian children enrolled in the public schools of Cass county have been studied. One hundred and twenty-one of these children or 67.3 per cent reacted to the Mantoux test, 39 of whom were X-rayed showing 23 with calcification of the hilum glands, two with parenchymal infiltration and 14 of whom no abnormal changes could be found.

SUMMARY AND CONCLUSION

There is a marked variation shown in the reaction of the tuberculin skin test between the white and Indian, and the white children of pre-school and school age.

Evidence of the adult form of tuberculosis as revealed by the X-ray shows a much higher incidence among the Indian than white.

(Concluded on Page 543)

	SKIN TEST						X-RAY					
	Total No. Tested		Number Positive		Per Cent Positive		Hilum Disease Calc. Glands		Parenchymal Infiltration		Primary Node	
	W.	Ind.	W.	Ind.	White	Ind.	White	Ind.	White	Ind.	W.	Ind.
Pre-school Age	20	151	1	61	.05	40.3	0	12	0	1	0	1
School Age	2,076	282	318	185	15.28	65.6	127	106	4	7	10	14
Total	2,096	433	319	246	15.21	56.81	127	118	4	8	10	15

## An Outbreak of Botulism in North Dakota

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*Grafton, N. D.*

THE purpose of this paper is to report an outbreak of botulism at Grafton, North Dakota, which occurred in February, 1931, and which we were privileged to observe in detail.

During the period from 1899 to 1928 there have been reported in the United States and Canada 156 outbreaks of this disease which have totalled 529 cases and 357 deaths, a case mortality of 67%. 59 of these outbreaks have been proven toxicologically and bacteriologically. Most of these outbreaks have occurred in the Western States, which is in accordance with the established fact that the distribution of the spores of the bacillus botulinus in the soil in the western states is greater than in the eastern and central states.

It is no doubt a fact that the majority of these outbreaks have resulted from the use of home canned products due, of course, to the fact that home canning is seldom carried out under pressure and as a result the organisms in a resistant spore stage are not destroyed.

The botulism toxin may be present in nearly any vegetable and fruit, and in addition in milk and certain meats and fish. The foods most commonly infected are string beans, corn, spinach, olives, asparagus, beets, apricots and pears.

The Grafton outbreak is unusual because there were thirteen cases and thirteen deaths, and it is perhaps the largest in mortality to be recently reported in the United States.

### EPIDEMIOLOGY

On the evening of January 29th, 1931, in a private home near Grafton, North Dakota, seventeen persons sat down to a midnight lunch consisting of buns, boiled weiners, salad, spice cake, cookies and coffee.

The salad which apparently contained the botulism toxin, consisted of a mixture of diced carrots, peas and string beans served with lettuce and salad dressing. These vegetables were from a mixture which had been home canned the previous season by the so called cold-pack method. They had been raised in the family garden and were mixed and canned together in Mason fruit jars with metal caps. All present at the party

ate of the salad except one. Another guest ate just a very little and two ate freely but vomited shortly afterwards, likely due to too much alcohol prior to the meal. None of these four persons developed any symptoms of the disease. It was noted that those who ate the most salad were the most toxic after the onset of the disease.

The salad was served cold apparently without any preliminary heating. It was learned that the family had been eating home canned vegetables all fall and winter and no one had been sick before. Neither had any of the poultry nor animals been sick. Unfortunately none of the salad or the unwashed fruit sealers were obtainable for laboratory examination.

### SYMPTOMATOLOGY

The symptomatology of the cases in the Grafton outbreak did not differ very much from the classical description of the disease.

The onset of symptoms in the earliest case was twelve hours after ingestion of the toxic meal, while in one case it was delayed until four days. Ninety per cent of the cases developed within the first thirty-six hours. Vomiting was an early symptom in about one-half of the cases, but there was no diarrhoea except that which was induced by catharsis.

Disturbances of vision were present in all cases and consisted of blurring and inability to distinguish objects at close range. This was due to loss of accommodation resulting from paralysis of the third nerve. No ptosis or pupillary changes were recorded.

Dizziness, fatigue and muscular weakness were common and many of the patients were unable to turn over in bed. Difficulty in swallowing and talking, resulting from pharyngeal paralysis, with accumulation of thick mucous in the throat was common, and choking spells, especially upon taking fluids were frequent.

In 50% of the cases the pulse was below 100 at all times, while the remainder presented an increase during the last twelve hours. The temperature was normal or subnormal in all cases except one, and the respirations were quiet and rapid. None of the patients complained of sensory symp-

toms or pain. The mentality remained clear up to the time of death in one-third of the cases, while the others appeared very toxic. The blood pressure, urine and blood presented no change from normal and two spinal punctures revealed normal spinal fluid.

All the cases died from respiratory failure, and in all cases the heart continued to beat for several minutes after respiration had ceased. The earliest death occurred eighteen hours following the appearance of symptoms, and the latest five days after symptoms were first noticed. Ten of the thirteen cases died within the first thirty-six hours after the onset of symptoms. This is a more rapidly fatal termination than is usually seen.

The case which had an incubation period of four and one-half days, lived for five days following the onset of symptoms. This was probably the only case which might have been influenced by the use of antitoxin. The delay of symptoms in this case was apparently due to the fact that this patient did not eat all of his salad. There is a possibility that actual symptoms were present early in this case, but were attributed to extreme catharsis and nervousness rather than to the disease.

#### PATHOLOGY

No specific pathology in botulism has been recognized. The principal microscopic finding is an intense hyperemia of the central nervous system and of the thoracic and abdominal viscera.

A post mortem examination was carried out in one of these cases by Drs. H. E. French and A. K. Saiki of the University of North Dakota. Their diagnosis was congestion of brain, meninges, liver, spleen, kidney and stomach, multiple hemorrhages in the tubules of the kidney, and chromatolysis and disappearance of Nissl granules in cells of basal ganglion. These findings were in correspondence with observations on record of other cases.

#### LABORATORY FINDINGS

The laboratory work in connection with this outbreak was carried out at the Public Health Laboratory at the University of North Dakota by Dr. A. K. Saiki; in the Department of Bacteriology at the University of Chicago, under the direction of Dr. S. H. Koser; and in the Department of Bacteriology at the North Dakota State Agricultural College under the direction of Professor Casper Nelson. Their findings were in accordance with each other.

Samples of some of the home canned vegetables which were found in the basement of the home

presented definite evidence of spoilage in several of the sealers. All of the specimens, however, were negative for either the spores or the toxin of bacillus botulinus. It is unfortunate that none of the salad used was available, and that to date none of the soil from the garden producing the vegetables used in this salad has been cultured for the presence of the bacillus botulinus.

The spinal fluid from one patient and a specimen of blood from a second were found to be non-toxic. The contents of the colon from the patient that was autopsied was found to contain an organism that could be recognized culturally and morphologically as bacillus botulinus and that produced a toxin fatal to laboratory animals and capable of being neutralized by Type A antitoxin.

#### DIAGNOSIS

The diagnosis of botulism may be very simple or may present considerable difficulty. The history is of great importance and when a number of persons develop similar nervous symptoms after having eaten a common food, botulism should be strongly suspected. The disease should always be considered even in isolated cases where the characteristic symptoms of weakness, visual disturbances, disturbances of swallowing and talking, constipation, normal or subnormal temperature and absence of pain, are present. Unfortunately, there is no positive laboratory test to clinch the diagnosis. Some observers have demonstrated the toxin in the patient's blood by inoculation into animals.

In making a differential diagnosis, acute gastroenteritis due to bacillus proteus and enteritidis should be considered because this form of food poisoning is frequently confused with botulism. In this condition the gastro-intestinal symptoms such as vomiting, diarrhoea and abdominal cramps are marked and nervous symptoms are either entirely absent, or if present, limited to muscular weakness.

Botulism may closely resemble atropine or belladonna poisoning in that in both conditions there is thirst, dryness of the mouth and throat, difficult swallowing, impaired vision and absence of temperature. With belladonna poisoning however, the symptoms begin quickly following the ingestion of the drug, (1 to 3 hours when taken by mouth), the pupils are widely dilated, face flushed, a erythematous skin rash may be present and delirium, convulsions and coma are common.

In wood alcohol poisoning vomiting is usually persistent and delirium marked. Here the visual disturbances are due to an atrophy of the optic

nerve and consists of partial or complete blindness. Coma usually results and precedes death.

Neurologists tell us that encephalitis may simulate any disease. It can be easily seen that an acute hemorrhagic encephalitis with early involvement of the cranial nerves, and respiratory center could be readily confused with botulism. In encephalitis, however, an elevation in temperature would be the rule, and sensory disturbances more common. The same difficulty might be experienced in differentiating botulism from atypical forms of poliomyelitis and acute meningial lues.

#### TREATMENT

The treatment of botulism is very unsatisfactory. In a very broad sense it consists of educating the public to take greater care in canning food products and to discard food which presents evidence of spoiling. It is then equally important to educate the medical profession to be familiar with the symptomatology of the disease in order that the diagnosis may be made promptly. It is especially necessary to know an antitoxin is available and may be of value if used early.

The prophylactic treatment is of greater importance than the curative treatment.

Home canning, as ordinarily carried out, frequently does not destroy the botulinus spores. In times of economic depression home canning is especially prevalent and since high pressure sterilization is seldom employed, we have here an important source of infection.

Canned food may present definite evidence of spoilage, for example the ends of the sealers may be bulged, the liquid contents cloudy, gas under pressure may escape upon opening the sealer, and an odor of butyric acid may be noticeable. In our outbreak several sealers of food were found in the home corresponding to this, but upon animal inoculation neither the spores nor the toxin could be identified. On the other hand, it must be kept in mind that food may be normal in appearance and odor and still be contaminated.

The fact that the toxin is rather easily destroyed by boiling affords us the most help in prophylaxis. Few, if any, of the preserved foods are injured or made less palatable by boiling and if this procedure was carried out before canned food was either tasted or eaten, the number of cases of botulism would be considerably decreased. It is, therefore, not necessary to discourage home canning, but rather only to impress upon kitchen workers the need for taking more pains in preserving food, for watching carefully for evidence of spoilage, and finally for heating

preserved foods for five to ten minutes before serving them.

In active treatment of botulism, the antitoxin must be placed first even though the results obtained with it, to date, have been rather disappointing. It must be kept in mind that there are two distinct types of bacillus botulinus, which are known as Types A and B. Therefore, a polyvalent serum must be used unless it is positively known whether the symptoms are being produced by the A type or B type. The number of cases in which a polyvalent serum has been used is apparently very small and it is questionable whether the antitoxin treatment has really been given a fair trial.

It seems reasonable to believe that in administering antitoxin for botulism the same general rules should apply as when employing antitoxin in the treatment of tetanus and diphtheria, all of which are due to a neuro-toxin. The best results are always obtained when the antitoxin is given early in the disease and in large doses. By this I mean 20,000 to 30,000 units intravenously and intramuscularly every six hours. The cost of this antitoxin is \$3.60 per 5,000 units which makes it no more expensive than antitetanic serum.

It is necessary to inform the medical profession that the only company in the United States manufacturing botulism antitoxin is the Jensen-Salisbury Laboratories of Kansas City, Missouri. In the Grafton outbreak it was four days before we were able to obtain this information although vigorous efforts were made. The larger and better known biological houses do not manufacture this antitoxin because the demand for it is limited, and because Government regulations issued by the National Institute of Health will not permit the handling of this dangerous anaerobe in laboratories engaged in the manufacture of other biological products for human use, on account of the very high resistance of the spores to heat and germicides. An entirely independent and isolated laboratory would be necessary, and this is not justified in view of the limited demand for the product.

Without the employment of antitoxin, the treatment is largely symptomatic. If the patient is seen early, gastric lavage may remove portions of contaminated food from the stomach. If pharyngeal paresis is present the tube may pass with difficulty and may bring on a strangling attack together with marked cyanosis. Active catharsis is indicated using castor oil or magnesium sulphate to be followed by frequent enemas. Rest in bed is indicated, although many of the victims insist

they are more comfortable sitting up in a chair. Progressive muscular weakness eventually forces them to remain in bed. The dryness of the mouth is an indication to supply fluids, but the pharyngeal paresis causes patients to refuse liquids by mouth except in small amounts. This makes it necessary to give water either by rectum or hyperdermoclysis. A suction aspirator may be of value in freeing the pharynx from the tenacious mucous which accumulates there.

Some observers have stated that the use of alcoholic drinks with the infected meal will offer some protection against botulism poisoning. In this outbreak it appears very likely that two of the patients who ate the food developed no symptoms because of the vomiting which resulted from the indulgence of too much alcohol just prior to the meal.

Since most of the victims die from respiratory paralysis, respiratory stimulants are indicated. Caffeine sodium benzoate and strychnine are possibly of value when given in large doses. Atropine should be avoided as it increases the dryness of the mouth and throat. Morphine may be necessary if there is marked restlessness.

It is interesting to speculate as to what would happen to a botulism patient who is approaching the stage of respiratory paresis and failure, if he were placed in a Drinker respirator. This machine has been found useful in treating cases of infantile paralysis where the muscles of respiration have been affected. The toxins have a special affinity for the nervous system and early in the disease the base of the brain is involved. If the effect of the toxin on the respiratory center in the medulla is not complete and permanent, it might be possible to carry the patient over until the toxin is no longer active; at any rate, it would be worthy of a trial.

#### CONCLUSIONS AND SUMMARY

1. An outbreak of botulism in eastern North Dakota resulting in thirteen cases and thirteen deaths was evidently due to home canned string beans, peas and carrots.

2. Botulism is the most fatal type of food poisoning and is the most hopeless to treat.

3. The eating of fresh fruits and vegetables involves no danger from botulism.

4. Boiling quickly destroys the toxin and it is the best prophylactic measure we possess.

5. Greater care should be exercised by kitchen

workers in the canning of foods, and all foods presenting evidence of spoiling should be destroyed.

6. The symptoms of botulism are usually referable to the nervous system rather than to the gastro-intestinal.

7. The Grafton outbreak presented few, if any, unusual features, but is reported for its possible statistical value.

8. A supply of botulism antitoxin should be kept available in the various public health laboratories throughout the state so that it could be quickly obtained in case of a future outbreak.

9. The antitoxin treatment has not been given a fair trial.

10. The term ptomaine poisoning is vague and misleading and should be discarded.

#### ACKNOWLEDGEMENTS

We are indebted to Dr. C. R. Tompkins, of Grafton, North Dakota, for the clinical summaries of the cases he observed, to Dr. H. E. French and Dr. A. K. Saiki, of the State Public Health Laboratory, and Dr. William Carey and Dr. S. A. Koser, of the Department of Bacteriology of the University of Chicago for the pathological and bacteriological reports.

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#### TUBERCULOSIS SURVEY IN AN INDIAN COUNTY IN MINNESOTA

(Continued from Page 539)

Epidemiologically the Indian child traces his reaction to an association with an open case often more than the white. This no doubt is due to the much greater incidence of pulmonary tuberculosis in the Indian population, which, of course, explains the almost universal tubercularization of its child population.

The association of the two races in the school complicates an educational problem so far as the white children in the county are concerned.

## Internal Injuries Involving Internal Organs\*

A. W. IDE, M.D.

*St. Paul*

IF ONE would attempt to define the term "internal injury," he would find himself in some difficulty. Unfortunately the term is about as vague to the medical profession as it is to the laity. Allen describes an internal injury as follows: "An indefinite and mysterious disarrangement of our vital organs usually inconsistent with life."

Vance has divided internal injuries of the abdominal viscera into two classes, the first caused by stab wounds or other wounds that penetrate the skin and leave an external mark. These he calls per-cutaneous injuries. The second type is due to the action of a non-penetrating force. Such injury traumatizes the abdominal viscera but does not leave a characteristic penetrating wound on the surface. This second class Vance calls sub-cutaneous injuries. The first class, namely, per-cutaneous injuries, while perhaps more serious to life than the second class, is more easily recognized, more easily diagnosed, and may be treated along more standard lines. The second class, sub-cutaneous injuries, in which the skin is not penetrated is the type of wound we have under consideration at this time.

There are certain signs present to a degree in all of these injuries. These may be enumerated as follows: Shock, pallor, sweating, restlessness, shallow breathing, rapid pulse, low blood pressure, nausea and thirst. Besides these there are certain local signs that are to a very great degree present in all cases. These are general abdominal tenderness, painful respiration, boardlike rigidity, changes in tympany, dullness and usually there are local signs in the abdominal wall.

In the cases to be reported one will notice that the site of injury can at times be definitely located and the proper diagnosis made largely from that. Although the wall is not penetrated, there is evidence of local trauma, discoloration, tenderness, extravasation of blood, and possibly injury to bones. There is also usually a very definite history of local injury to the abdominal wall. This history and the local signs are vastly important. If the injury has been in the region of the liver, spleen or urinary bladder, one may easily reach a fairly accurate conclusion that if any structure

is injured, it is the structure lying immediately beneath the site of injury.

Special examinations may give definite information or may corroborate evidence obtained in other ways. A bubble of air under the diaphragm as shown by the X-ray definitely points to a rupture of the gastro-intestinal tract. The X-ray may reveal a splinter of bone that has torn the urinary bladder. The catheter in the bladder may show blood and no urine, definitely pointing to an intraperitoneal rupture of the bladder. A cystoscopic examination may give a definite diagnosis.

Transportation of the patient is perhaps one of the most important points of treatment. The patient should not be rushed to the hospital and should not be exposed to added trauma and bleeding. The automobile is very largely responsible for these injuries but it may also prove to be useful. A patient may be transported in an ordinary automobile quite as comfortably and perhaps with less delay than in an ambulance. When the patient is first seen, he is in severe pain and usually some shock. Morphine is ordinarily indicated. This should, if possible, be given before the patient is moved. He should be kept warm and dry and should be kept in a prone position or perhaps have the head lowered. After the patient has arrived at the hospital a sufficient length of time should be taken to study the case carefully. This time can be utilized for further treatment in combating shock. The patient should be placed in a Trandellenburg position and dry heat applied. He should be given plenty of fluids and blood transfusion if necessary. Surgery should not be undertaken until consideration has been given to all the factors of the case. Any patient that has a systolic blood pressure under 100 should be carefully guarded. If the systolic blood pressure is below 80, surgery should probably not be done until the blood pressure has improved.

Diagnosis: In discussing diagnosis Hinton suggests as the first step the differentiation between first, retroperitoneal hemorrhage; second, intra-abdominal hemorrhage, and third, rupture of the hollow viscera. As a working hypothesis this classification seems very good. Under his first classification, retroperitoneal hemorrhage, he sug-

\*Read at the annual session of the North Dakota State Medical Association, Grand Forks, June 1, 1932.

gests a separate classification of hemorrhages due to kidney injury and hemorrhages that are not due to kidney injuries. These cases simulate injuries of the abdominal viscera, possibly due to irritation of the sympathetic nervous system. From the standpoint of surgery, it is particularly important to differentiate between retroperitoneal hemorrhage and intraperitoneal hemorrhage. While an abdominal incision may serve a useful purpose if the hemorrhage is intraperitoneal, it can hardly accomplish much good if the hemorrhage is retroperitoneal. His second class, intra-abdominal hemorrhage, covers most of these cases that demand surgical care. The diagnosis of intra-abdominal hemorrhage should be made first and then a sub-classification should be considered of the source of the bleeding. The third classification, rupture of the hollow viscera, covers rupture of the gastro-intestinal tract and ruptures of the bladder.

General Consideration: From a practical point of view, it would seem that the number of sub-cutaneous injuries to the abdominal viscera could be reduced to the consideration of a very few injuries. It must, of course, not be overlooked that any or all of the abdominal organs may be injured. It must also be borne in mind that the retroperitoneal organs, the kidneys, the blood vessels and other soft tissues, may be injured and may confuse the diagnosis. As a matter of fact, ninety-five per cent of the reported cases of sub-cutaneous injury to these structures could be classified under injuries to the liver, spleen, kidney, gastro-intestinal tract and urinary bladder. Other injuries that may be met with in clinical work are injuries to the pancreas, gallbladder, common duct and mesentery. However, these, and injuries to the other abdominal viscera, would in all probability be diagnosed only at operation. It would be impossible under any ordinary circumstances to differentiate between these injuries before the abdomen is opened.

It is further interesting to note that in the literature there are comparatively few of these injuries reported, even in clinics, where a vast volume of work is being handled. While in the aggregate the number of cases of rupture of the bladder, injury to the liver and injury to the spleen seems large, one must consider that these figures are taken from a very large volume of work. In the experience of the average man, one might easily go through a fairly busy professional life and never see one of these cases that requires surgery. The following statistics are interesting:

Massachusetts General Hospital, 1900 to 1931,

treated 112 cases of sub-cutaneous internal injuries—various organs.

Cook county, 1926 to 1929, treated 50 (including private patients treated by the staff)—bladder injuries.

Michelson, in Levinson surgery, 1913, collected 298—rupture of spleen.

Injuries to the Liver: A case of injury to the liver that I wish to report is Case I, a man of 24 years of age, who was thrown from a motorcycle against a curb in the street. He was brought to the hospital immediately. He had evidently been struck a severe blow over the liver as he was thrown against the cement curbing. He complained of pain in this region. His pulse was rather rapid. There was a moderate degree of shock. The patient was operated upon immediately with a diagnosis of injury to the liver. A small laceration was found on the dome of the liver and a considerable amount of blood in the abdominal cavity. The laceration of the liver was not bleeding at the time of operation. After exploration the abdominal cavity was aspirated free of blood and the abdominal wound closed. The patient made an uneventful recovery.

This patient would have recovered without surgery. The laceration was not bleeding at the time of operation and all in all the patient would have been better off if the operation had not been done. However, with a diagnosis of rupture of the liver an exploration was certainly warranted as it might easily have proven to be a life saving measure.

On June 9, 1931, I saw Case II, with Dr. Petraborg, of Stillwater. The patient was a man 58 years of age, a farmer. His past history is immaterial. At 1:30 P. M. this patient was kicked by a horse, the hoof of the horse striking the lower ribs on the right side over the liver. The patient was seen by Dr. Petraborg shortly after the accident. At that time he was in severe shock and severe pain. I saw the patient twelve hours after injury. The pulse rate at that time was 120 per minute. The blood pressure was systolic 80 and diastolic 30. He showed evidence of severe contusion of the upper abdominal wall over the liver. Immediate operation was not advisable on account of the patient's bad condition. An exploratory operation was done fourteen hours after the injury. The abdomen was found filled with blood. There was a stellate laceration over the dome of the liver. The abdomen was freed from blood and the wound in the liver was packed with gauze and the abdomen closed. The patient died

of shock four hours after the operation was completed.

This patient would have died with or without operation. The patient's chances would have been better if the operation could have been done sooner. However, the outcome would have probably been fatal under any circumstances.

To these two cases might be added the type of case that one sees at autopsy where injury to the liver is more severe. There may be complete rupture of the liver with immediate fatal hemorrhage.

Various writers suggest conservative treatment in injuries to the liver, holding that after the hemorrhage has stopped operation is unnecessary and if the hemorrhage has not stopped operation will be of no avail. While it may be correct theoretically to deny surgery to these cases, practically, it is out of the question. When these patients are seen early and they are in sufficiently good condition to stand surgery, an exploration is certainly warranted. There are some cases, at least, where hemorrhages could be arrested. If these were allowed to go untreated, they would result fatally. Further, it must not be forgotten that one's diagnosis is much more certain after the abdomen is opened than it is before. One can not be absolutely sure as to just the nature of the lesion or exactly what organ is injured. It would, therefore, seem that if one is reasonably sure that there is a grave injury to the abdominal organs, an exploration should be done.

**Injuries to the Spleen:** Case III—a boy twelve years of age—was struck by an automobile and brought to the hospital immediately. He was in rather profound shock when admitted. He evidently had been struck across the upper abdomen. The pulse was rapid. There was marked pallor. The abdomen was boardlike. After preliminary treatment the patient was sufficiently improved to stand an abdominal operation. There was evidence of injury over the splenic region and this, together with the symptoms, led to the diagnosis of probable rupture of the spleen. An abdominal exploration was done and a laceration was found on the convex surface of the spleen. The laceration was not extensive. There was a moderate amount of blood in the abdominal cavity but the spleen was not bleeding at the time of operation. The abdominal cavity was freed from blood and nothing further was done. The patient made an uneventful recovery.

**Comment:** It is said on good authority that all cases of ruptured spleen should have a splenectomy. This case is an exception. These cases are apt to have secondary bleeding. In nearly all cases

where the spleen is injured, a splenectomy should be done unless the spleen is adherent or if for some other reason the procedure would be difficult. With an injured normal spleen, the operation is not difficult and may be done rather rapidly. There are no serious after results and there is much less risk to the patient with a splenectomy than without it. Here again, while the only thing the operation accomplished was the removal of blood from the abdominal cavity, it was well worth while as an exploration. Even after operation there was a good deal of uncertainty as to the outcome of the case. If the injury to the spleen had been greater, a splenectomy would certainly have been necessary to save the patient's life.

**Injuries to the Kidney:** This patient, Case IV—a male, age 43—employed as a switchman, was injured October 3, 1929, when he was struck by an engine. He was brought to the hospital immediately by ambulance. When he arrived he was having very severe pain and distress in his back, particularly on the right side. X-ray examination showed fractures of the eleventh and twelfth ribs posteriorly, transverse processes of the first and second, lumbar vertebra on the right side and spinous process of the twelfth dorsal vertebra. There was marked swelling and ecchymosis of the right side over the kidney. The patient was vomiting a bloody fluid. There was marked distention of the abdomen. There was blood in the urine on catheterization. The patient's condition was grave for four days and then he gradually improved. This patient had contusion, possibly laceration of the right kidney.

Case V—a man 64 years old—was injured October 30, 1931. He was thrown from a railway motor car injuring his back and right hip. He was hospitalized twelve hours after injury. On admission catheterization showed 200 c.c. bloody urine. The X-ray examination showed fracture of the pelvis with some displacement, and comminuted fracture of the right acetabulum with displacement of the head of the femur. There was also a fracture of the ninth, tenth, eleventh and twelfth ribs on the left side. The patient's condition was serious for about a week. During that time he required frequent gastric lavage and intravenous fluids. The urine was small in amount and bloody for several days. An indwelling catheter was used for three days. This patient had an injury to the left kidney, possibly laceration.

**Comment:** These cases both are examples of severe contusion of the kidney treated without operation. Both cases made a good recovery and

if there had been no other injury, convalescence would have been quite rapid. It sometimes happens that a large hemaoma, often mixed with urine, will develop in the region of the kidney. A perinephritic abscess may be a late complication. These cases also illustrate the danger of overlooking an internal injury when a more apparent injury is present. It is axiomatic in traumatic work that one should not allow one injury to obscure another.

**Injuries to the Gastro-Intestinal Tract:** Case VI, a young man who was playing football, was struck in the abdomen by the knee of a fellow player. He experienced severe pain and tenderness in the abdomen. He was immediately prostrated, was placed on a stretcher and brought to the hospital, a distance of thirty miles. When first seen he had a boardlike abdomen. This with the history of injury and increased white blood count led to a diagnosis of ruptured bowel. Operation was done three hours after the injury. The patient evidently had an explosive rupture of the small bowel about two feet from the ileocecal valve. Apparently at the time the blow was received, this loop of bowel was distended with gas and it had popped under the impact. The rent in the bowel was repaired. The abdomen was closed with drainage and the patient made an uneventful recovery.

**Comment:** Ruptures of the gastro-intestinal tract are rare except where there is some underlying pathology present. Ruptures of the stomach with ulcers present an entirely different picture.

**Ruptures of the Bladder:** Case VII was thrown from a speeder and sustained multiple fractures of the pelvis. There were no special bladder symptoms and a bladder laceration was not suspected. Ten days after the injury a fluctuating mass pointed above the symphysis pubis to the left. This was incised and a urinary fistula developed. A small amount of urine was discharged. The sinus healed after about two weeks.

**Comment:** DeTarnowski analyzes fifty cases of rupture of the bladder. These cases are quoted from Cook County Hospital, 1926 to 1929, and private cases are included. He says that less than five per cent of ruptures of the bladder are caused from injuries to the bone. It is rare that a special section of bone will tear the bladder. In cases where the trauma has been directed over the lower part of the abdomen and there is pain following, rupture of the bladder should be suspected. These ruptures are classified as intraperitoneal and extraperitoneal. Intraperitoneal rupture, while more serious, is more easily diagnosed. It is possible,

if the intraperitoneal tear is large, that a catheter will remove a large quantity of urine from the abdominal cavity. In one Cook county case 7000 c.c. of urine was recovered by catheter from the abdominal cavity. The extraperitoneal tears of the bladder are difficult to diagnose. These cases ordinarily remain undiagnosed until there is sufficient evidence of extravasation of urine to be recognized. In cases where extraperitoneal injury is suspected and cannot be diagnosed, an indwelling catheter for a week's time is indicated. There are no pathognomic symptoms that will definitely diagnose extraperitoneal lacerations of the bladder. X-ray is of doubtful value. The cystoscope in certain cases will make a positive diagnosis but in other cases where there is an overlapping of mucosa the cystoscope may not reveal the damage. Bloody urine is not to be relied upon. The urine may be clear. It is not allowable to inject fluid into the bladder to demonstrate a rupture. Rupture of the bladder is a surgical emergency and the laceration should be repaired at once whether this be extraperitoneal or intraperitoneal.

#### DISCUSSION

DR. R. E. WEIBLE, Fargo: I have enjoyed Dr. Ide's paper very much as I lived over again with him similar injuries that I have frequently encountered.

Gastro-intestinal injuries are not frequent, as Dr. Ide has stated. Usually it is one of the other organs that is injured. However, distended viscera are ruptured by blows and mesenteries can be so torn that severe hemorrhage follows, while fractured bones and dislocations even are possible.

The most unusual intestinal injury that I recall fell to the lot of a cowboy riding a gentle horse and leading another by a halter. The patient himself could not recall many details. He knew his horse went into a violent fit of bucking and that he stayed in the saddle until the horse quieted down when he slid off onto the ground. Physical examination and skiagraphs showed a fracture of the symphysis pubis, a tearing of the ligaments of the left sacroiliac joint and a dislocation of the left ilium upwards nearly two inches. The anterior surface of the rectum was torn from below the peritoneum to the skin. The perineum was packed with feces. Facial planes were torn free anteriorly upward over the abdomen. Gas could be felt as high as the axillae and later several incisions evacuated pus and gas with a colon bacillus odor. The patient recovered by suture of the rectum, and heavy extension of the left leg, although complete reduction of the dislocation did not take place.

Another patient had a severe laceration of the rectum by falling on an upright piece of wood.

Injuries of the liver are suspected if the trauma is in the liver region. Exploration should be done under these circumstances, and the liver sutured, tamponed

or both before hemorrhage has done damage or a bile peritonitis is started. An instance of liver laceration due to a horse kick comes to my mind.

The mortality of splenic injuries without operation is 80 to 90%. Hemorrhage is the cause. With operation the mortality is about one-third.

With severe injuries splenectomy is the only method to be used. Tamponing or suture may be followed by secondary hemorrhage and this should be remembered in choosing the method of operating. I recall a stellate laceration of the spleen in a young farmer who was kicked by a cow. I did not try to suture, for a gauze tampon held against the injury stopped the bleeding and the abdomen was closed.

Like liver injuries a positive diagnosis cannot be made. The site of the injury and muscle spasm create the suspicion of splenic trauma.

Injuries to the kidney may be in the cortex only with a hematoma under the capsule. If the capsule is lacerated, hemorrhage occurs but not extravasation of urine. This last is present only when the laceration is in the renal pelvis. Laceration of the pedicle, a rare condition, produces such a furious hemorrhage that nothing can be done.

An intoxicated man ran his automobile into a telephone pole. His condition not improving after a few days, operation was done. A large laceration was found in the lower one-third. The patient's condition during the operation grew worse and I wanted a short method to reduce the operating time. By pressing the lower pole against the remainder of the kidney, bleeding was checked. A tampon that produced a similar pressure was used successfully.

Indirect injury may follow muscle strain if the kidney is pathological. I wish to report a rare case of indirect injury to a normal appearing kidney.

A section-hand and the rest of the crew were carrying a rail on their shoulders. The man in front of the patient stumbled and the patient suddenly was forced to take the additional weight on his shoulders. His symptoms were immediate and he was sent to the hospital. The general condition of the patient being satisfactory and no evidence of anemia appearing despite the persistent bloody urine, I waited three weeks before operating. The lower third of the kidney was torn nearly off and a nephrectomy was done.

Unnecessary loss of time before operating which is so important in abdominal injuries, usually does not hold true in renal trauma. Careful investigation can be done and the best time selected if surgery is needed.

Since the observations of Hippocrates and Galen, rupture of the bladder has been considered a fatal lesion. Peritonitis or sepsis within the space of Retzius follows unless surgery is done promptly. Diseased bladders may rupture by straining, although direct trauma is the usual cause. I remember several due to fracture of the anterior pelvic bones.

In concluding, I again call your attention to the value of tamponade, with or without suture, in the carefully selected patient. I am a firm believer in early operation if there is grave suspicion of abdominal damage, since I have seen patients lose their lives through delay. Waiting to do scientific diagnostic procedures often results in the loss of valuable time. The history, physical examination showing tenderness and spasm, and the general appearance of the patient are the most important and helpful points in determining what should be done. I would rather do an unnecessary exploration occasionally, as Dr. Ide said he did in his spleen case, than lose a patient through procrastination.

## Infantile Paralysis, Diagnosis, Treatment\*

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ON THE subject of infantile paralysis much has been said, but on many of its aspects the final word remains unspoken. There is probably no other common disease about which so much disagreement and uncertainty exist in the minds of various clinical and laboratory observers. Even the very fundamental nature of the disease has not been convincingly settled. Originally infantile paralysis was regarded as a primary disease of the central nervous system, but in the past few years evidence

has been advanced to show that it is a primary disease of the lymphatic systems of the body, the virus gaining entrance to the body by way of the intestinal tract, and involvement of the central nervous system occurring only as an accident or complication of a widespread infectious disease. However, some investigators, notably Fairbrother and Hurst, still maintain that the changes in the central nervous system are due to the direct action of the virus on it, rather than being secondary to the changes that occur in the perivascular lymphatic channels of the central nervous system. And so it is about other aspects of the disease such

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as the exciting cause, the method of transmission, the value of convalescent serum as a therapeutic measure, etc.—all characterized by rather wide differences in opinion.

The one aspect of infantile paralysis about which there is an unanimity of opinion among all clinicians is the certainty with which it may be diagnosed in the preparalytic stage. Although it is possible to diagnose poliomyelitis in the preparalytic stage in 100 per cent of cases it is not always, by any means, a simple matter. In the majority of instances where the virus has attacked the central nervous system the symptoms and signs will indicate the true nature of the disease, but in a certain number of cases the exact diagnosis cannot be made without examination of the cerebro-spinal fluid. For this reason every case in which there is the least suggestion of infantile paralysis in the preparalytic stage should have a lumbar puncture and examination of the cerebro-spinal fluid. Otherwise the diagnosis will be missed in a goodly number of cases. In four out of the thirty cases of infantile paralysis admitted to the Wisconsin General Hospital during the epidemic last year the physical signs were so indefinite that we felt sure that they did not have the disease; yet lumbar puncture, performed in these cases only as a precautionary measure, resulted in fluids being obtained which were absolutely characteristic of infantile paralysis. It is quite evident then that the ability of every physician to do a lumbar puncture and to make the proper examination of the cerebro-spinal fluid is of utmost importance in making the diagnosis of poliomyelitis before paralysis has developed.

Although the clinical manifestations of infantile paralysis are subject to considerable variation, a clear understanding of the symptoms and signs of the disease is to be gained by a consideration of the possible courses the disease may take. Regardless of the portal of entry and of the route of dissemination of the virus throughout the body, the disease becomes at first a general systemic infection. That this is true is shown by the fact that in 10 per cent of all accurately diagnosed cases of infantile paralysis there is a preliminary stage of general systemic involvement which precedes, by several days, the signs of meningeal involvement. For example, a child is taken ill with fever and the signs of an upper respiratory infection or gastro-intestinal disturbance which last for 24 to 48 hours. This illness is presumably indicative of a general systemic infection. The child becomes free from symptoms but in two to four days he is again attacked by fever and the

signs of meningeal irritation indicating invasion of the central nervous system. One to four days later paralysis may follow representing extension of the inflammation to motor nerve cells. It is believed that the disease may be stopped at any point in this development. Hence the rationale of the classification of types into abortive, nonparalytic and paralytic.

The abortive type corresponds to the stage of general systemic infection. The existence of this limited type of case is entirely presumptive but it fits in with the theory that this type occurs very frequently and is responsible for the immunization of great numbers of people.

The non-paralytic type corresponds to the preparalytic stage of the paralytic type and the symptoms in the two are identical except that in the non-paralytic type the disease stops short of paralysis. In this type evidences appear of involvement of the central nervous system. Although in 10 per cent of cases this stage is preceded by a period of general systemic infection and separated from it by a period of freedom from symptoms—formerly called the “dromedary” type—in the remaining 90 per cent of cases no clear-cut separation of stages occurs. In the majority of cases the latent period, that is, the period of freedom from symptoms, is so slight and short that the periods of general systemic infection and central nervous system involvement seem to fuse and the symptoms and signs of meningeal irritation appear soon after the onset of the disease. However, with or without preliminary involvement the onset of the symptoms of this preparalytic stage is usually rather sudden. Fever, headache and vomiting are customarily the first symptoms. The temperature ordinarily rises to around 101° F. but may, in some cases, reach 104°. Headache is sometimes very distressing and may be general or frontal in situation. Vomiting is frequently present at the onset but is not persistent. The facial expression is not infrequently that of apprehension. When present, the peculiar, apprehensive, furtive look of the child having poliomyelitis is diagnostic in itself. It was present in marked form in 25% of our cases. Anorexia often continues throughout the course of the acute manifestations. Constipation is rather more common than diarrhea. Dizziness, irritability when awake, drowsiness when unmolested and pains in the back and limbs are apt to appear soon after the onset. Hyperesthesia is very common, and the patient is particularly tender along the spine and in the legs. Sometimes there is photophobia, or excessive sweating, or retention

of urine. There may be coarse tremors or convulsive twitchings of various groups of muscles. Dr. Draper believes that the appearance of tremors and muscle twitchings represents the earliest clinical indication of the attack on the anterior horn cells by the virus, the first action of this union being one of stimulation. Delirium is apt to appear in the cases having severe involvement. The pharynx is usually congested to a moderate extent. The pulse rate is usually rapid and often out of proportion to the fever. In appearance the patient looks and acts sicker than the degree of fever would indicate.

Now is the time at which the diagnosis should be made in order to accomplish the most good with serum—provided any benefit is to be derived from the use of serum. However, in order to make an accurate diagnosis a most careful physical examination for evidence of central nervous system involvement is necessary. Stiffness of the neck and spine is always present but is usually slight and never so marked as in tuberculous meningitis or cerebro-spinal meningitis. It is often so slight as to be missed by the examiner unless specifically looked for. Its detection is often impossible with the child in the supine position by the ordinary method of raising the head from the pillow. Instead it is necessary to hold the child in a comfortable position and ask him to kiss his knee, whereupon, when the sign is positive, the child after commencing the action refuses to complete it because of pain in the back. Another method of eliciting this sign is that described by Amoss. When the child is placed in a sitting posture upon a firm surface, such as a table or chair, the position assumed is that of tripod, the child conveying part of the weight of the body through the arms in order to ease the pain in the back. The presence or absence of this sign may also be demonstrated by raising the child from the recumbent position with the examiner's hands placed under the buttocks and shoulders. When the sign is positive, the child will not hold his head in the horizontal plane with the body but instead, on account of pain, will permit it to fall back. The knee jerks are usually increased at this time and may be unequal. Kernig's sign is often negative but may be positive, particularly in those cases showing more than usual meningeal involvement. The blood count ordinarily shows an increase in the white blood cells to around 15,000 and an increase in polymorphonuclear cells to 80 to 90 per cent.

In the presence of symptoms and signs such as these the pre-paralytic stage of poliomyelitis

should at least be suspected but the absolute diagnosis depends upon the spinal fluid findings. The spinal fluid in poliomyelitis may or may not show an increase in pressure. The fluid may be clear where the cell count is still low, or hazy, or have a "ground glass" where the cell count is higher. The number of cells averages from 200 to 300, but may vary from 20 to 1200 or more. Care must be taken to examine a fresh specimen of spinal fluid in as much as the cells tend to dissolve in an hour or so. Albumin and globulin are usually moderately increased. The amount of sugar is the same as in normal fluid or may be in excess. The gold sol curve is characteristically 1122100000.

The disease may stop here or it may go on into the paralytic stage. That it may stop at this point has been proved by Neal who was able to transmit the disease to monkeys with nasal washings from just such cases. However, in the pre-paralytic stage it is impossible to predict from the clinical symptoms, the physical findings, or the spinal fluid changes whether the case will escape without paralysis or become paralyzed, or even go on to a fatal termination.

The paralytic type may be divided into 3 types—the ataxic, the upper motor neurone involvement, and the lower motor neurone involvement.

The ataxic type is very rare in occurrence. The motor nerve cells are not involved but there is ataxia, nystagmus, and lack of coordination. The signs come from involvement of the cerebellum, Clarke's column, and the intervertebral ganglia.

The upper motor neurone involvement resulting in spastic paralysis is also very rare in occurrence.

The lower motor neurone involvement resulting in flaccid paralysis is, of course, the most common form. This form may again be divided into the spinal cases, bulbar cases, and combinations of spinal and bulbar involvement.

Paralysis usually appears during the first four or five days of the disease and in many cases comes on during the second day. In some uncommon instances the paralysis appears within a few hours of the onset and is preceded merely by lassitude and fatigue. Once the paralysis occurs it usually reaches a maximum within a few hours of its onset, but in some instances it appears to spread up the body, eventually involving the muscles of respiration and causing death from asphyxia. In the average case, with the appearance of paralysis, the fever gradually returns to normal in 4 to 6 days. Pain in the back and extremities is apt to continue for several days. Following

the wave of appearance of paralysis, recovery begins to set in, and evidences of improvement may usually be found within two weeks; mild cases, indeed, may clear up within one week.

During the past several years the most popular form of treatment of infantile paralysis in the pre-paralytic stage, has been the use of convalescent serum. Because of the enthusiastic promotion of it by a number of clinicians and laboratory workers convalescent serum has come to occupy such a prominent position as a form of treatment of infantile paralysis in the preparalytic stage that health authorities in various states have been forced into the production of large quantities of convalescent serum in order to satisfy the demands for it by physicians and the public alike. For example, early this month a Chicago newspaper carried an item to the effect that the officials of the Illinois Public Health Department had started the production of a large amount of convalescent serum for expected use this summer. Yet during the past two years there has been taking place a very definite change in the attitude toward convalescent serum by a few clinicians who have had an extraordinarily large experience with infantile paralysis. This change in attitude has recently been climaxed by a report by Dr. Park of New York City before the meeting of the Association of American Physicians held in Atlantic City a little over a month ago, in which he stated that a comparison between 408 untreated and 519 cases treated with convalescent serum indicated that the final outcome of poliomyelitis in the preparalytic stage is uninfluenced by convalescent serum. Through a personal communication Dr. Park informed me that out of 408 untreated cases—untreated because of serums not being available at the time—observed by competent pediatricians in New York City in the summer and fall of last year, 73.7% escaped without paralysis or weakness, 14.2% developed weakness, 11% became paralyzed, and 0.9% died. Out of 519 cases treated with convalescent serum by the same men who observed the 408 untreated cases 68.8% escaped paralysis, 7.7% developed weakness, 19.6% became paralyzed and 3.8% died. In other words the children who did not receive the convalescent serum got along better in regard to the incidence of paralysis and had a lower mortality rate than those who did receive treatment with convalescent serum. However, when the hypothetical question was put to Dr. Park as to what he would do if his own child developed infantile paralysis, he replied, "In the present state of knowledge, while I would not give my child con-

valescent serum, I would not urge others to omit it." In addition he stated that in view of the many favorable reports on the use of convalescent serum in communities where every case was treated he thought final judgment on its efficacy should be withheld until other large series of treated and untreated cases had been studied.

Up until the time of Park's report the majority of observers have agreed that while convalescent serum administered in the preparalytic stage of poliomyelitis does not afford complete protection against paralysis, it does greatly reduce the severity and extent of paralysis. For example, by the scale used by the Harvard Infantile Paralysis Commission the grade of paralysis was 63.6 in the untreated cases as against 19 for the paralyzed treated cases.

In his communication to me Dr. Park says nothing about the extent or severity of the paralysis in the treated and untreated cases observed by him and his staff last year. The mere fact that he does not probably indicates the absence of any great difference in the two groups. In our series of 24 treated in the preparalytic stage, and leaving out of consideration one young adult who came to a fatal termination in less than 48 hours after the onset, the extent of paralysis in the 10 in which it occurred was not great—certainly not nearly so great as in many other cases admitted from the same community in the paralytic stage. For example, the severest paralysis in any of our 24 cases treated in the preparalytic stage consisted of paralysis of the right shoulder girdle. Of the other 9 who developed paralysis, the amount of paralysis was slight such as one-sided toe drop or wrist drop. On the other hand among cases sent in in the paralytic stage paralysis of two or all extremities and of the back and abdomen were not uncommon. However, no conclusions may be drawn from such a limited number of cases and experience as ours, and it is safe to say that at the present time the opinion of those having the largest experience with the treatment of infantile paralysis is that convalescent serum is probably of no value in influencing the disease. It may be said with truth, however, that in spite of the recent doubt cast upon convalescent serum the public at large in many communities still regards convalescent serum as being practically specific for poliomyelitis, and in order for the physician practising in such a community to maintain his reputation, it may be necessary—for psychological reasons—for him to submit to the demands of his clientele whether he believes in convalescent serum or not. On the other hand the physician may truthfully

state that, judging by the study of the epidemic in New York City last year, the majority, at least 70%, of cases of poliomyelitis seen in the preparalytic stage get well without developing paralysis or weakness and that the prognosis as to life is very good.

It is in a way strange that the results from treatment with convalescent serum are not better than they are because the reasons for its use are certainly well grounded. It is well known that an attack of poliomyelitis just as is the case with measles, apparently confers a lasting immunity to the disease. The serum of convalescents should then be expected to contain virucidal properties. That it does contain virucidal properties is shown by the fact that when mixed with the virus it is impossible to transmit the disease to monkeys by injections of the mixture. Furthermore, when convalescent serum is given alone to the monkey it is impossible to produce the disease for a matter of several days even by intracerebral injection of the virus alone. The imperfect results from convalescent serum may be due to insufficient dosage, and if it were possible to concentrate convalescent serum as readily as diphtheria antitoxin, better results might be obtained from its use. That dosage may be a factor is also suggested by the results of the treatment of adult cases of poliomyelitis reported by Shaw, Thelander, and Limper in the issue of November 28, 1931 of the *Journal of the American Medical Association*. As a rule the prognosis of poliomyelitis in the adult is bad, the disease usually being steadily progressive, very severe or fatal and uninfluenced by the ordinary amount such as 75-100 cc. of convalescent serum. But by treating such cases with dosages of 150-400 cc. of convalescent serum Shaw and his co-workers obtained "encouraging results."

The imperfect results from convalescent serum may also be due to the failure to administer it early enough in the course of the disease. If Draper is correct in his assumption that the presence of tremors and muscle twitching indicates the earliest sign of union between the virus and anterior horn cells, and that once this evidence appears the possibility of successfully neutralizing the virus with serum becomes greatly reduced, it is apparent, that the earliest moment in the preparalytic stage is the ideal time for the use of

convalescent serum. In our series of cases last year convalescent serum in amounts of 75 to 125 cc. was administered intravenously and intramuscularly within the first 24 hours of the onset of the disease in 8 cases. Of these 8 cases one developed a permanent wrist drop on one side and the other 7 entirely escaped paralysis. One young adult received serum in the first 24 hours of the disease and died before 36 hours had passed. Out of 14 cases treated within 48 hours after the onset of the disease only 3 developed slight paralysis. The point is, however, that even though convalescent serum was administered as early in the course of the disease as ever practically possible, paralysis did occur. The final decision as to whether or not the dosage and early administration are factors in the value of a convalescent serum as a method of treatment of infantile paralysis will depend upon a comparison of a large number of treated and untreated cases. Perhaps some of you will have the opportunity of making such a comparison.

As to the route of administration of convalescent serum, when it is used the intravenous or intramuscular routes seem advisable. Reports in the past of intravenous and intramuscular routes of injection have indicated results equal to those of the intraspinal route. Consequently it seems unnecessary as well as unwise to expose the child with poliomyelitis to the added danger of intraspinal injection.

A final point for consideration is concerned with prophylaxis of infantile paralysis. It may be here as a prophylactic agent that convalescent serum has its greatest usefulness—just as has measles convalescent serum for the prevention of measles. Every child definitely exposed to an active case during the first three weeks of the disease probably should be afforded protection by the subcutaneous or intramuscular injection of either convalescent serum or whole blood from both parents. Parents are presumably immune to infantile paralysis, but in order to be sure of obtaining an active immune substance it is better to use the blood from both parents rather than from a single parent. Ten to twenty cc. of convalescent serum or 15-20 cc. of blood from each parent is probably a sufficient amount to afford the necessary protection if administered within a few days after exposure.

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### GASTRIC ACIDITY

As the result of recent studies, the tendency appears to be to look upon the determination of acid in the stomach contents as of less value than was formerly placed thereon.

Gastric analysis was thought of such importance by many diagnosticians that it was made a routine part of every examination. A decided change has taken place in this respect. Because the normal range of acidity is so tremendous, its significance in many cases appears obscure and uncertain. Worthwhile conclusions can rarely be drawn except in cases of pernicious anaemia, gastric ulcer and carcinoma. When any of these disorders are suspected, it may still be relied upon as a valuable adjunct.

### PHYSICIANS' PUBLIC SCHOOL CERTIFICATES

A motion came before the Board of Education of Minneapolis recently to accept certificates of chiropractors in certain cases where "physicians' certificates" had previously been construed as implying those of M. D.'s only.

The attorney general ruled that the board had a right to accept them, but after a hearing, at which four members of the Hennepin County Medical Society spoke briefly, the motion was lost by a unanimous vote in the negative.

It was pointed out by the speakers that the state university provided but one school of medicine and the confusion and misunderstanding which the nomenclature of any other might cause. Stress was also laid upon the great variety of disorders that children might be afflicted with, and

the difficulty at times of making a differential diagnosis without the availability of every test known to medical science.

The chairman of the School Board Committee of the local medical society is to be commended for his alertness and thoughtfulness in arranging for this hearing. It was all that the school board needed to arrive at a prompt decision. We refer to this editorially because we would arouse from lethargy the many physicians who fail to bestir themselves in public matters. We have faith that constituted authority will do right according to the light and guidance that it has, and here is an example to sustain our contention.

### PROPHYLACTIC POLITICS

It is unfortunate that so many intelligent citizens, including members of the medical profession, should hold themselves aloof from politics, satisfying themselves by simply voting the ticket, in whose making they have had no part; even complaining at times that this act of voting at elections is of little avail.

The very allegation that self-interested persons prepare such ballots, would lead us to ask these intelligent and avowedly unselfish critics where they were during the pre-campaign days.

To share in every phase of our government is not only a privilege and a duty but a dignified thing to do, and we must remember that the ballot is the child of the participants in the caucus, primaries and political conventions. The physician, whose confidential relations with his patients brings him in such intimate contact with the entire family, should be able to exert his influence for the betterment of our government to an unusual degree if he keeps himself fully informed of each political movement from its inception. To do this, he must have been in attendance at its birth.

We believe we are rendering a public service when we urge upon our readers that their appointment books should contain data on all pre-

campaign events in their respective localities. Not only this but every person should methodically keep on hand a revised and up-to-date reference book of all public officials whose duty it may be to serve him in any capacity.

Let us take our responsibilities of citizenship seriously as we prize the rights and benefits that they afford.

Let us not forget that prophylactic methods may be of great value in politics as we have learned them to be in the practice of medicine.

A. E. H.

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#### THOMAS G. LEE, M.D.

Dr. Thomas G. Lee, 72, of Babson Park, Fla., formerly a member of the faculty of the medical school at the University of Minnesota, died September 1 in a hospital at Vero Beach, Fla., of injuries received four days previously in an automobile accident.

He came to the medical school as professor of histology and embryology when it was first organized as the college of medicine and surgery of the university under Dean Perry H. Millard and was later made head of the department of anatomy, which position he occupied for about thirty years, until his retirement three years ago. During the past three years he has lived and made his home on an orange farm at Babson Park. Funeral services were conducted at a crematory at Orlando, Fla., Saturday, September 3.

Professor Lee worked faithfully in the establishment of his department from the beginning; he was never engaged in the private practice of his profession but gave his wholehearted effort to the students, by whom he was sometimes affectionately nicknamed "Kariokinesis," in recognition of the thoroughness with which he taught indirect cell division. Unassuming and modest, thoroughness characterized all his work, rare qualities in an age of so much bluster and speed.

He was a member of many scientific societies and a past master of University Lodge, A. F. & A. M., and past venerable master of Excelsior Lodge of Perfection of the Scottish Rite and an honorary thirty-third-degree mason. He received B. S. and M. D. from the University of Pennsylvania, later studying at the University of Wurzburg, Munich, and Harvard, where he also received B. S. Before he came to Minnesota he was on the faculty at Yale and Radcliffe. He was the author of monographs on the embryology of vertebrates, particularly the implantation and placentation of previously undescribed rodents.

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## SOCIETIES

Program for the Northern Minnesota Medical Meeting, Crookston, Minnesota

September 19 and 20, 1932

1. "Surgical Clinic"—Dr. Owen Wangensteen, Univ. of Minn.
2. "Medical Clinic"—Dr. Moses Barron, Minneapolis, Minn.
3. "Pediatric Clinic"—Dr. Ralph Pray, Fargo, N. Dak.
4. X-ray Demonstration—Dr. Leo Rigler, Univ. of Minnesota.
5. Papers will be presented by the following:  
 Drs. J. M. Hayes, V. J. Schwartz, Hobart Reiman and J. K. Anderson of Minneapolis.  
 Drs. J. R. Manley, C. M. Smith and F. J. Hirschboeck of Duluth.  
 Drs. Waltman Walters or D. J. Balfour, and Dr. Russell Wilder or Dr. C. H. Watkins of Rochester.  
 Dr. O. J. Hagen of Moorhead.  
 Dr. S. Sturmans of Erskine.  
 Dr. D. Stewart of Nanette, Minn., has also been invited.

Ex-Governor Theo. Christianson is going to speak at the banquet Monday evening on "An Answer to Pessimism."

Dr. O. M. Oppegaard is in charge of the local arrangements.

The officers of the Society are:

President ..... Dr. George Wattam of Warren  
 Vice Pres. .... Dr. C. M. Smith of Duluth  
 Secy. & Treas. .... Dr. O. J. Larson, Detroit Lakes

#### Attention, North Dakota Doctors!

Too frequently doctors having a patient seeking admittance to San Haven write us asking if we have room and fail to state whether the patient is male or female, adult or child.

Time is lost thus and correspondence made necessary to give us these details before we are in position to give the information sought.

This can best be illustrated by reciting the fact that we now have thirty-two adult female patients on the waiting list, and only four males, and this notwithstanding the fact that the third and fourth infirmary floors are occupied by adult females and one cottage intended for ambulatory or exercise female patients has for two years been used for infirmary females, while only one infirmary floor is in use for male adults.

Further, the Masonic Cottage, for males, has been remodeled inside to accommodate sixteen of the waiting list of female infirmary cases.

The ratio of the total of adult females for infirmary care as compared with adult males is at present as three is to one at San Haven.

Instead, therefore, of having as heretofore, two cottages each for adult male and female exercise patients,

we are reduced to one for each, the other two having been given over to the care of infirmiry females.

Yet what San Haven requires is a third infirmiry unit that the open adult cases may be cared for and the Masonic and Girls Cottage No. 2 revert to their original uses.

Will the North Dakota State Medical Association, the State Tuberculosis Association, and the State Board of Health please co-operate in procuring from the next legislature this additional space for the state's needy tuberculous residents?

Surely, from an economic standpoint alone, this activity is extremely urgent.

CHAS. MacLACHLAN, M. D.,

Medical Superintendent,

North Dakota State Tuberculosis Sanatorium,  
San Haven, North Dakota.

## NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Dr. W. G. Hough has reopened offices and will resume his practice at Malta, Montana.

Dr. Virgil E. Quanstrom of Brainerd, Minn., has joined the staff of the Beise Clinic of that city.

Dr. A. J. Larson, formerly of Mobridge, South Dakota, passed away recently at Madison, Minn.

Dr. George C. Jacobs of Wahpeton is now located in Fergus Falls where he will continue his practice.

Dr. J. D. Alway of Aberdeen has just returned from Europe, where he has been visiting for several months.

Dr. Paul Leck was chosen school doctor for the ensuing year by the Board of Education of Austin, Minn.

Dr. J. S. Hamilton who practiced in Bathgate, N. D., for the past 16 years died at his home at the age of 66.

Dr. N. T. Weston, of Garvin, Minn., who had been ill for the past several years died on August 31 at his home.

Dr. William Davis of St. Paul will return shortly from Cape Cod, where he has been spending the summer.

Dr. C. R. Blakeslee of Kenyon, Minn., has taken over the practice of the late Dr. J. B. State, at Faribault, Minn.

Dr. Iver S. Benson is closing his office at Montevideo, Minn., and will return to Willmar, his former home.

Dr. F. H. Van Dyke of St. Paul recently visited Williston, N. D., where he was in practice from 1891 to 1918.

Dr. J. B. Grace of Watertown, S. D., has moved to Big Stone City, S. D., where he will continue his practice.

Dr. A. P. Nachtwey of the Dickinson Clinic recently addressed the Dickinson Rotary Club on Recreation and Health.

Nine nurses were graduated from Mercy Hospital, Williston, N. D., at the annual graduation exercises recently held.

Dr. P. W. Harrison has joined the Worthington Clinic at Worthington, Minn., according to an announcement recently made.

Dr. A. N. Currie has opened offices at Glasgow Montana, where he will practice general medicine. Dr. Currie was formerly of Whitehall.

Dr. F. H. Wieckman who was connected with the Sleepy Eye Medical Clinic until a short time ago is now located at New Ulm, Minn.

Announcement has been received of the marriage of Dr. John L. Barton of Sioux Falls, S. D., to Miss Fannie J. Holman of Minneapolis.

The Mercy Hospital in Alexandria, Minn., which has been closed for some time, has been reopened, according to an announcement recently made.

Dr. B. W. Kelly of Aitkin, Minn., was recently elected second vice-president of the Minnesota Reserve Officers Association, at a meeting at Fort Snelling.

Dr. R. N. Manley, government doctor for the Pillager band of Indians at Ponsford and Pine Point, died suddenly in a hospital at Detroit Lakes, Minn.

Dr. N. G. Mortenson of St. Paul, vice president of the State Board of Health was recently re-elected president of the American Legion Hospital Association.

Dr. C. G. Bacon of Marshall, Minn., a practicing physician for the past 35 years, died at his home recently. Dr. Bacon is survived by his widow and one daughter.

Dr. C. C. Hoagland of Madison, S. D., who has been in active practice for over 26 years has sold his practice and will reside for an indefinite period in Berkeley, California.

Dr. Louis C. Jensen, Minneapolis, has just returned from a two months trip in Europe. During that time he visited leading hospitals and clinics in Copenhagen and London.

The JOURNAL-LANCET has recently moved its office to new and larger quarters at 218 Essex Building, 84 South Tenth Street, Minneapolis, and will be very happy to receive visitors.

Dr. C. E. Lowe announces that Dr. A. W. Spiry, recently of Salt Lake City, Utah, has become associated with him in the practice of medicine and surgery, with offices at Moberg, S. D.

Dr. Thomas G. Lee, a member of the original faculty in the college of medicine at the University of Minnesota and a member of the department for 37 years, died recently at Vero Beach, Florida.

Mr. Parkhurst, Watford City, N. D. osteopath, who was arrested for administering drugs to his patients, entered a plea of guilty before Judge Lowe, on August 16 and was fined \$50.00 and costs.

Formal announcement of the appointment of Miss Henrietta Crockett as public health nurse in the city-county health department was made by Dr. F. D. Pease, health officer of Missoula, Mont.

Dr. A. E. Bellows of the Hot Springs Clinic, (S. D.) has recently returned from Pasadena, California, where he attended a semi-centennial class reunion of Grinnell, Iowa, high school class of '82.

Dr. J. R. Ostfield, of Jamestown, N. D., formerly a member of the North Dakota State Hospital and who is now located at Fargo, was married on September 4 to Hazel Papermaster of Grand Forks.

Dr. V. T. DeVault, who has been practicing medicine at Williston, N. D., for nearly a year, has accepted the post of senior medical officer in charge of a hospital for the Lobitos Petrole company at Lobitos, Peru.

Dr. Charles E. Remy announces the recent opening of a department for psychopathic patients at the Minneapolis General Hospital. The hospital unit which was remodeled for that purpose accommodates 30 patients.

First steps toward organizing all registered nurses of Watertown, S. D., into a city nurses' club were taken at a joint meeting of graduate nurses recently. A new standard fee for registered nurses was adopted.

Dr. J. A. Myers was one of the guest speakers at the recent meeting of the West Virginia Tuberculosis and Health Association at Elkins, W. Va. The title of Dr. Myer's address was, "Tracing Tuberculosis to Its Source."

The North Dakota State public laboratory, rounding out its 25th year, shows a long record of usefulness, according to statistics from the main office, located in Grand Forks. Branches are also maintained in Fargo, Minot and Bismarck.

Dr. F. E. Harrington, Minneapolis Health Commissioner, will be one of the speakers at the joint session of the International Society of Medical Health Officers and the American Association of School Physicians in Washington, October 21.

With appropriate ceremonies the new hospital at the Government Indian School at Pipestone, Minn., was formally opened. The hospital was built by the government at a cost of \$61,000, the equipment at a cost of \$10,000. A nurses' home cost \$9,000.

The October first issue of the JOURNAL-LANCET will be a special nutrition number, to be edited by Dr. Arnold S. Anderson of the Board of Control and will contain papers by some of the leading physicians in the Northwest who are interested in this particular phase of medicine.

The Sioux Falls district medical society held its last meeting at Sioux Falls, September 13. The guest speaker was Claude Dixon, M.D., of Rochester, Minnesota, who spoke on "The Management of Malignant Lesions of the Colon." The ladies' auxiliary met at the same time.

The International Assembly of the Interstate Postgraduate Medical Association of North America will be held in the Murat Theatre and Shrine Temple, Indianapolis, Indiana, October 24-28, 1932. Many distinguished teachers and clinicians will appear on the program. All members of this state are cordially invited.

The Watertown District Medical Society of the South Dakota State Medical Association held a dinner meeting at Watertown, August 9th, at 6:30 P. M., with a program as follows: "The Alleviation of Pain in Obstetrics," Dr. John H. Moore, Grand Forks; "Sinusitis in Children," Dr. Edwin B. Banister, Grand Forks.

The newest addition to Grafton's, S. D. professional group is Dr. George L. Countryman, son of Dr. and Mrs. J. E. Countryman, who commenced his duties here immediately after receiving his license to practice in North Dakota. Dr.

Countryman is a graduate of the school of medicine at the University of Illinois, Chicago.

The following Minneapolis doctors attended the Mississippi Valley Sanatorium Association and the Mississippi Valley Conference on Tuberculosis at Indianapolis, Indiana: E. S. Mariette, Frank L. Jennings and J. A. Myers; also Cathryne M. Radebaugh, executive secretary of the Hennepin County Tuberculosis Association.

Dr. A. G. Allen, well known former physician and Surgeon of Deadwood, S. D., has returned to that city and has re-established himself in the general practice of medicine and surgery. Since leaving Deadwood some years ago, Dr. Allen had been identified with the Hot Springs, S. D., clinic, later engaging in private practice at Denver, Colo.

In keeping with the times the Good Samaritan Hospital and Sanatorium, Harvey, N. D., announces a substantial reduction in rates. A general tonsilectomy is now \$10.00 and a local tonsilectomy is \$7.50. Both these prices include surgery and one day at the hospital. This is according to a notice which was recently published in the local newspaper.

Drs. Chas. R. Drake, Moses Barron, D. R. Hastings and A. E. Hedback represented the Hennepin County Medical Society in a hearing before the Minneapolis Board of Education recently, and the motion to accept other certificates than those of the regular medical profession in matters pertaining to the disabilities of school children was promptly and effectively voted down.

The Chest Clinic conducted by Drs. S. A. Slater and W. P. Ross of the Southwestern Sanatorium, Worthington, Minn., on August 22 was very well attended, 59 patients being examined. Several of the patients were in need of sanatorium care and are now being taken care of in their institution. These clinics are being given once each year and will be given oftener if necessary.

Dr. E. G. Sasse, Lidgerwood, N. D. physician, was called from his office to do what he could for an unidentified boy found dying of a bullet wound, on the outskirts of the city. When the doctor arrived at the scene of the accident, he found the body to be his youngest son, Wallace, aged 9. The lad apparently had accidentally shot himself while hunting gophers with a target pistol reconstructed from an old rifle barrel.

The Quarterly meeting of the Black Hills Medical Association was held at Belle Fourche on August 25. The following men gave the clinical program: Drs. J. M. Walsh, Rapid City; F. W.

Minty, Rapid City; and C. A. Walters, Belle Fourche. Officers of the Association are Dr. J. O. Threadgold, Belle Fourche, President; Dr. N. E. Mattox, Lead, Vice President; Dr. Freda J. Radosch, Rapid City, Secretary and Treasurer.

The Twelfth District Medical Society of the South Dakota State Medical Association held its midsummer meeting July 29th at the summer home of Dr. H. G. Harris of Wilmot, S. D., located on Big Stone Lake. Following the dinner, the society was addressed by Dr. P. F. Donohue of St. Paul on "Transurethral Prostactectomy." This address was illustrated with lantern slides, case reports, and presentation of pathological material.

Secretary Dr. G. A. Williamson of the Board of Medical Examiners has been informed that a Mrs. M., against whom complaints had been filed for practicing obstetrics, had ceased her activities and was no longer doing that work. Dr. Williamson suggests that if all doctors would take action against these old women he thought they would soon cease to practice. If all the doctors in North Dakota would cooperate with the Board it would be very easy to clean out irregular practitioners.

Dr. R. V. Williams of Rushford was named president of the Southern Minnesota Medical association at the business meeting of the fortieth annual meeting at Rochester, Minnesota. He succeeds Dr. C. C. Allen of Austin. Other officers elected are Dr. H. C. Habein, Rochester, first vice president; Dr. W. H. Valentine, Tracy, second vice president; Dr. M. C. Piper, Rochester, secretary-treasurer. While the doctors attended business sessions their wives participated in a golf tournament and later at a bridge tea.

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters). The speaker is William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The programs for the month of October will be as follows: October 5, "Coronary Disease"; October 12, "Hearing Tests"; October 19, "Prevention of Rickets"; October 26, "Advances in Plastic Surgery."

The Minnesota Public Health Association sponsored a short course in Tuberculosis at Buena Vista Sanatorium on August 31. Physicians from Wabasha, Winona, Houston and Fillmore counties attended. Speakers for the course were,

as follows: Dr. Russell H. Frost, superintendent of the Buena Vista Sanatorium; Dr. E. A. Meyering, St. Paul, executive secretary of the Minnesota Public Health Association; Dr. F. F. Callahan of the Pokegama Sanatorium; Dr. Walter H. Ude, Minneapolis; Dr. J. A. Myers, associate professor of medicine of the University of Minnesota, and Dr. C. N. Hensel of St. Paul.

### BOOK NOTICE

MINOR SURGERY OF THE URINARY TRACT, by Hermon C. Bumpus, Jr. With a chapter on Caruncles by John L. Greshaw and a chapter on Postoperative Care by Anson L. Clark. 57 Illustrations. Philadelphia, W. B. Saunders Company, 1932.

This is the seventh of a series of Mayo Clinic Monographs and is a product of the Section on Urology of that organization. Chapter I deals with General Considerations, covering Anesthesia, Preparation of the Patient, Table, Sterilization, Irrigating Solution and Electrical Equipment. The following chapters discuss Caruncle of the Urethra, Stricture of the Urethra, Hypertrophy of the Prostate Gland, Carcinoma of the Prostate Gland; Contracture of the Neck of the Bladder, Stones in the Bladder, Tumors of the Bladder, Infections in the Bladder, Stones in the Ureter and Postoperative Care, with an adequate bibliography and index.

It is a most useful and informative book, containing in its 100 pages of reading matter a clearly expressed résumé of the non-radical methods found best in the ample experience of the author and his associates. The chapter captions indicate the wide scope covered by this monograph and the only change which the reviewer can suggest is the substitution of the word Conservative for Minor in the title, for the work is really a compact treatise on the Conservative Surgery of the Urinary Tract and in every way deserving of the more distinctive name.

GILBERT COTTAM, M.D., F.A.C.S.

### CLASSIFIED ADVERTISEMENTS

#### TECHNICIAN

Technician and registered nurse would like position in a clinical laboratory or doctor's office. Good references. Address Box 935, care of this office.

#### X-RAY MACHINE WANTED

An x-ray in perfect condition wanted. State price and make of machine in first letter. Address Box 930, care of this office.

#### MEDICAL STENOGRAPHER

Experienced medical stenographer, can take charge of office and assist in treatment room. Will work reasonably. Address Box 921, care of this office, or phone Dinsmore 5366.

#### LABORATORY TECHNICIAN

Recent graduate laboratory technician would like position in physician's office or laboratory. Capable and willing. Salary no object. Address Mary A. Krohn, 5317 Fremont Ave. So., Minneapolis, Minn.

#### HOSPITAL SUPERINTENDENT

Experienced small hospital superintendent wants position. Widow, age 41. Would consider taking over small private hospital on profit sharing basis. Address Mrs. C. Van Lougen, 2429 Emerson Ave. So., Minneapolis, Minn.

#### FOR RENT

Doctor's office in new office building, in best business and residential district. Pleasing reception room. Up-to-the-minute examination rooms. Individual treatment rooms and laboratory. Free gas, free compressed air. Best opportunity for increasing practice or for beginner. Address Box 929, care of this office.

#### FOR SALE

One Hanovia Quartz Light (new burner), new price \$450.00, sale price \$250.00; one large McIntosh Diathermy, new price \$575.00 with accessories, sale price \$250.00; one L. O. Fischer Diathermy, new price \$625.00, sale price \$275.00; one Acme X-Ray 5/30 unit, good as new, cost \$875.00, will sell for \$425.00. This equipment is guaranteed to be in first class condition. Address, box 925, care of this office.

#### PHYSICIAN WANTED

Physician wanted to take over established office. Joint office in connection with dentist, use joint reception room. Present physician moving and will sell some equipment very reasonable. Located in Minneapolis near the Loop. New building. Address Dr. E. L. Ness, 344 E. Franklin Ave., or phone Bridgeport 4743, Minneapolis.

#### WANTED

A Sanatorium staff physician with institution experience, preferably a northwest resident, married or single, but without other dependents. Reference required. Salary limited. Board, room and laundry included. Must be open for service October 1st, or at least by the New Year. Position permanent. Address Dr. J. A. Myers, 730 La Salle Building, Minneapolis.

#### FOR SALE

Five bed hospital in Minnesota. The chance of a lifetime. Hospital, office and residence combined. Am retiring; sell 50 cents on the dollar. \$5,000 cash, balance easy terms. Address Box 933, care of this office.

#### DOCTOR'S OFFICE ASSISTANT

Young lady, 24 years old, wants position as doctor's office assistant in Minneapolis. Knowledge of medical history, medical terms and psychology. Six months' experience with dental technician. Address Vera Garnet, 4127 Illinois Ave., Minneapolis. Phone Walnut 5187.

# THE JOURNAL-LANCET

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## Thoughts on Nutrition\*

ARNOLD S. ANDERSON, M.D.

*Executive Secretary, Tuberculosis Division, State Board of Control  
St. Paul*

THE important relationship between food and health is becoming more and more a subject of research work and discussion. If, at the present time, one ventures on a reading tour in the field of nutrition, one meets with a most interesting array of convincing investigation as to the importance of food in the body economy. Not only is interest shown in diet as a factor in the cure of disease, but there is also presented new evidence as to its possibilities in the prevention of illness and its intimate relationship with body development and tissue function.

The growing need for a greater appreciation of dietetics by physicians is evidenced by authoritative comments such as the following: H. C. Sherman,<sup>1</sup> Professor of Chemistry, Columbia University, in a paper presented at the last annual meeting of the American Medical Association, said: "To the extent that food can make the difference between a merely average and a better-than-average nutritional condition, it may also function as a more potent resource in the physician's armamentarium than has yet been generally appreciated."

McCollum and Simmonds<sup>2</sup> in the latest edition of their book entitled, "Food, Nutrition, and Health," made this introductory statement: "There has never been a time when so many people were interested in the subject of foods and

nutrition as now. This is because we have learned so much about the subject in recent years that its importance for health and long life is more apparent than in the past. Even our common foods have dietary properties which we knew nothing about until they were revealed by the newer methods of research in recent years. We know that if the diet does not provide the right substances and in the right amounts, the physiological processes do not run smoothly, and life does not last so long as when the system is supplied with a proper pabulum. Old age appears sooner than is necessary, and the body becomes a prey to disease which might under more favorable conditions have been avoided."

Russell M. Wilder<sup>3</sup> of the Mayo Clinic, in an address given at the annual meeting of the American Medical Association, gives a most logical plea for the more careful consideration of the matter of diet by the medical profession. After commenting on the unwarranted claims made by food faddists, he says: "As a result of all this, the profession is acquiring an antipathy to the subject of diet therapy, and many physicians, even some who know better, have been goaded into the display of actual hostility. The idea that ordinary, everyday folks are in any danger of vitamin or other deficiency is ridiculed; the increasingly probable condition of mild or incipient avitaminosis is rejected before the evidence is examined;

\*Especially written for The Journal-Lancet Nutrition Number.

the conclusions of the serious students of nutrition are ignored, and dietitians are denounced because of their efforts to put these principles into practise."

This, I believe, is a most wholesome warning coming at a time when food faddists are flourishing, when science has uncovered much of the mystery about food, and when the discovered facts prove quite conclusively that correct feeding is a vital part of proper nutrition. It is at such a time that investigation and understanding on the part of the physician becomes extremely necessary for the proper guiding of the patient along the road of right eating.

Some time ago, a friend of mine having visited in California, returned tremendously impressed with the importance of diet in the life of the ordinary person. He had witnessed the favorable effects of a diet, freed from artificial stimulants as coffee, tea, alcohol, pepper, etc., and consisting mostly of fresh raw vegetables, fruits, nuts, cereals, and dairy products, especially milk. He had applied the test to himself and was gratified to experience an increased vitality and a better sense of well being. He made the criticism that doctors, as a rule, fail to instruct the average patient well enough on the matter of diet. This criticism is not uncommon, the attitude being that unless the patient has diabetes, gastric or duodenal ulcer, or some other such disease long recognized as requiring careful feeding, there seems to be no great concern on the part of the physician in regard to the diet. When one notes the extreme care exercised in the feeding of the average healthy infant, being certain that the fat, protein, carbohydrate, mineral, and vitamin balance is correct, and compares this with the "happy-go-lucky" diet choice of the adult there does seem to be a strange inconsistency. If rules and regulations in the feeding of the infant are so necessary for proper development, surely they cannot lose all their value in a scheme for the preservation of the health of the adult.

For some time past I have been wondering and inquiring as to the importance of a careful consideration of the average patient's diet. One of the first things that attracted my attention was the more or less haphazard way in which we both take and evaluate the average patient's diet history. We inquire rather minutely into the details of past diseases both of the patient and his ancestry, but pass over the past and present history of his food intake in a "take it for granted" manner that it was and is all right. In view of the newer knowledge of nutrition, it would seem that

such an attitude and procedure is hardly justified. The effects of the various food elements upon the body have been found to be so important and pronounced that a careful evaluation of each patient's eating habits seems necessary.

About a year ago I entered the home of a poor family at the time they were having their evening meal. I was struck by its meagerness and so I inquired as to the foods of the usual daily meals. The answer is given in the following menu, which is a fair example of what they usually ate:

*Breakfast*—Wheat cakes, syrup, coffee.

*Lunch*—Bread and oleomargarine, 1 glass of milk.

*Dinner*—Bread and oleomargarine, potatoes, minced meat (small portion), tea.

I submitted this menu to Miss A. Teigen, who has charge of the nutrition clinic at the University Hospital, and asked for an opinion as to its deficiencies. She replied that it was definitely lacking in fats, proteins, vitamins, and minerals. This was in true accord with the condition of the family. They were all undernourished, lacked vitality, and had that apathetic manner of the partially starved animal. I cite this case, not because I believe it represents the average American diet by any means, but because I believe it typifies the diet of a large number of families who, although fed, are nevertheless suffering from the effects of slow starvation.

I next submitted a menu which I felt was comparable to one that the average person subsists on and which by many would be considered adequate in every way. It consists of the following:

*Breakfast*—Oatmeal, milk and sugar, wheat cakes, butter, syrup, coffee.

*Lunch*—Vegetable soup, roast beef sandwich, hot chocolate or pasteurized milk.

*Dinner*—Steak, potatoes, creamed carrots, white bread and butter, apple pie, coffee.

The opinion as given was that it lacked vitamin C, a food accessory that is heat labile and destroyed by pasteurization and thorough cooking. The richest sources of this vitamin is shown in the table given you. They are: Citrus fruits, tomatoes, some other fruits, and vegetables; sprouted grain. The above diet was therefore lacking in fresh raw fruits and uncooked vegetables. The results of deficiency of this vitamin consist of "scurvy, growth failure, lowered vitality, capillary degeneration, hemorrhages and anemia, impairment of teeth, skeletal, muscular, and visceral degeneration, secondary infections."

In the past, nothing short of scurvy would have directed our attention to a possible vitamin C de-

iciency. Today we see other possible disturbances that may be just as much a vitamin C insufficiency result as is scurvy. The signs and symptoms however are less pronounced and so less seriously regarded. The same of course is true of the other vitamins and their associated deficiency disturbances. It is here much the same as has been the problem of tuberculosis diagnosis. Some years ago, we waited for the presence of a positive sputum before making a diagnosis of consumption. Today we seek the earlier signs as shown by the tuberculin test and the x-ray. It is therefore quite probable that in the field of nutrition we are missing the diagnosis of many deficiency conditions because of the lack of advanced symptoms and our failure to recognize the earlier signs.

The results of the various vitamin deficiencies are shown in the table.

UNIVERSITY OF MINNESOTA HOSPITALS			
Effects of Vitamin Deficiency			
Name	Chem. Char.	Richest Sources	Results of Deficiency
A Antikeratic	Fat-soluble Heat-stable	<i>Cod liver oil</i> ; milk and dairy products; egg yolk; glands; especially liver; green leafy vegetables.	Xerophthalmia; epithelial metaplasia; growth failure; emaciation; loss of vitality; sterility; urolithiasis; increased susceptibility to pyogenic infections (especially of visual, respiratory, digestive, and genito-urinary tracts) and possibly to neoplasms.
B (B1) Antineuritic	Water-soluble Heat-labile	<i>Yeast</i> ; whole grain cereals; fresh fruit and vegetables; egg yolk; milk; lean meat.	Polynneuritis and probably human beri-beri; paralysis; digestive disturbances; cardiac weakness; emaciation; loss of vitality; growth failure; anemia; impaired lactation.
C Anti-scorbutic	Water-soluble Heat-labile	<i>Citrus fruits</i> ; tomatoes, some other fruits and vegetables; sprouted grain.	Scurvy; growth failure; lowered vitality; capillary degeneration; hemorrhages and anemia; impairment of teeth; skeletal, muscular and visceral degeneration; secondary infections.
D Anti-rachitic	Fat-soluble Heat-stable	<i>Irradiated ergosterol</i> ; cod liver oil; irradiated foods; milk.	Rickets and osteomalacia; disturbance of calcium-phosphorous metabolism and ossification of the bones; dental caries; weakness and predisposition to infection.
E Anti-sterility	Fat-soluble Heat-stable	<i>Wheat germ oil</i> ; whole grain cereals; green vegetables; muscle; glandular organs.	Sterility; due to gonadal degeneration in male and imperfect placentation in female; embryonic death and resorption; muscular dystrophy paralysis in young.
F (G?B2 P-P)	Water-soluble Heat-stable	<i>Yeast</i> ; lean meat; milk; eggs; vegetables (?).	Pellagroid disorder in animals and (probably) human pellagra; dermal, digestive and neural lesions; weakness and growth failure.

Dr. Clarence M. Jackson.

The question may well be asked, "What evidence is available to show that vitamin deficiencies produce these various disturbances?" You are acquainted with the work proving the relationship of Vitamin A, B, C, D, and E deficiencies to xerophthalmia, beri-beri, scurvy, rickets, and sterility respectively. I will therefore more or less confine my remarks to other disturbances associated with vitamin deficiencies. I have time to mention but a few of the many investigations carried out on this subject.

Robert McCarrison<sup>4</sup> for some years has experimented on rats to determine the effects of certain diets on them. To the one group of over a thousand rats he feeds a diet comparable to that of certain people in Northern India where live some of the finest types of physical specimens.

This diet consists of whole wheat flour, unleavened bread with butter, fresh raw carrots, cabbage, unboiled, whole milk, a small amount of raw meat with bones and much water. For over two years there has been no evidence of disease in this group with the exception of an occasional tapeworm cyst of the liver.

To a second group of rats, living in every way identical to the first group, he feeds a diet comparable to that of other people of India, being definitely deficient in the vitamin foods. This consists to a great extent of foods such as white bread, margarine, tea, sugar, jam, preserved meat, and scanty overcooked vegetables. Here he finds all kinds of infections and affections of the lungs, skin, kidneys, nervous system, blood and heart. In those having a vitamin A deficiency, he found sinusitis, otitis media, gastro-duodenal ulcers, and urinary calculus. The rat response to

these diets was essentially the same as the physical condition found in the people subsisting on the particular type of diet.

In an attempt to determine the relationship between vitamin A deficiency and infection, Sherman and Burtis<sup>5</sup> used two groups of rats four weeks old. Both groups had been reared on a similar diet except that the second group had received less vitamin A although by no means a complete deficiency. Both groups were then placed on a diet completely depleted of vitamin A for a period of one month. They were next placed on a diet with a limited amount of vitamin A for eight weeks. Following this, they were autopsied. In the group reared on a diet abundant in vitamin A, the subsequent deprivation of this factor did not seem so detrimental. Only 25

per cent of these had infections. In the second group, however, which had been raised on a limited amount of vitamin A, there were 75 per cent infections. The authors draw attention to the fact that one year in the life of the rat is equivalent to thirty years in man and so the infections that develop at about 10 or 12 years of age in children may be indirectly the result of improper feeding during the first few years of life. One is given to wonder if some such principle is not a factor in the increased amount of pulmonary tuberculosis during the teen ages. It is not improbable that improper feeding during the first few years of life prepares the soil to such an extent that tubercle bacilli find the lung tissue more favorable for growth and multiplication than it otherwise would be. From experimental work, it would appear that a partial deficiency of vitamin A does not produce its observable effects until a long period of time has elapsed and in the human this may well be a matter of years. We are, of course, not talking about a complete lack of a particular vitamin, but rather an insufficient amount over a long period of time.

Green and Mellanby<sup>6</sup> also carried out investigations on the effects of vitamin A deficiency on susceptibility of rats to disease. They found that the control group of rats grew normally and showed no significant amount of disease. The 50 on a deficient vitamin A diet grew well for a time, then lost appetite, weight and died. Seventy-two per cent had abscesses at the base of the tongue. Forty-four per cent had kidney and bladder infections. Twenty-one per cent had gastro-intestinal lesions. Twenty per cent had sinus and middle ear suppurations. Nine per cent had broncho-pneumonia. The authors conclude that vitamin A has a closer relationship to resistance to infection than any other food factor of which we are aware.

Of late years, there has been a considerable amount of intelligent investigation on the subject of diet and its relationship to periodontal disease. Mrs. Mellanby's<sup>7</sup> work in this field has made her conclude that a deficiency of vitamin A leads to hyperplasia of the subgingival epithelium which paves the way for bacterial invasion. Vitamin D deficiency results in defective development of the alveolar bone. Dogs whose diet has been deficient in vitamins A and D during the early months of life develop periodontal disease in later life no matter what their subsequent diet is. Those whose diets are adequate in this respect develop little or no periodontal disease even with later faulty diets.

Such investigations impress upon us the tremendous importance of proper feeding during the early and developing period of life. It would seem that, just as the strength of a building is dependent upon the proper quantity and quality of the mortar ingredients going to make up the foundation of its structure, so also in the animal body its strength to a great extent would seem to be determined by the material which goes to make up its original framework.

J. B. Orr,<sup>8</sup> in a paper entitled "The Development of the Science of Nutrition in Relation to Disease," cites an interesting investigation made on two African tribes. The diet of the first tribe consisted chiefly of cereals, and was definitely deficient in calcium and vitamins A and D. The diet of the second was made up mostly of milk, meat and raw blood and though deficient in some respects was nevertheless rich in these nutrients of which the other was lacking. A survey as to the incidence of disease in these tribes showed that pulmonary conditions as bronchitis and pneumonia were about eight times as frequent in the first as in the second tribe; tropical ulcers, 11 times as common, and tuberculosis, six times as frequent. Rheumatoid arthritis was the most frequent disease in the second tribe.

When one compares this train of events with that occurring in experimental animals under much the same dietary regime, it is then quite logical to regard the matter of diet in these tribes as a big factor in their break-down from disease.

Grant, Bowen and Stegeman<sup>9</sup> in an experimental investigation as to the role of vitamin D in the resistance of white rats to tuberculosis draw the following conclusions: "1. Decreasing the vitamin D of the diet sufficiently decreases the resistance of white rats to tuberculosis, from a high immunity to a susceptibility to subcutaneous injections of a virulent strain of bovine bacilli."

"2. Gloomy winter weather, as it influences the amount and nature of sunlight, forces young rats to obtain a larger part of their supply of vitamin D from the diet. If the vitamin D content of the diet is low, rickets is intensified and the susceptibility to tuberculosis is increased."

These few examples taken from a wealth of interesting literature on the subject should be sufficient to make us more appreciative of the possibilities of food therapy and to make each one of us more inquisitive on the subject. That our present knowledge on the subject of nutrition may be but a small beginning toward great discoveries seems not improbable. The history of progress has shown a constant adding to or

changing of our views, never leaving us with a final or complete conclusion. This tendency to change in our conceptions is well illustrated in the remark of no less a scientist than Graham Lusk<sup>10</sup> when he said: "I remember poking fun at the tomato as being nothing but water colored red, only to be later shown that it contained vitamins A, B and C." So, too, it may be found that posterity will view our present day diet therapy as definitely inadequate for obtaining the best possible results in body efficiency from the use of foods. This statement is quite in keeping with the results of recent experimentation showing that a much greater amount of the vitamin factor is required to give the maximum therapeutic results to the body than is required to keep it from showing signs of the vitamin deficiency diseases.

In support of the above, I can do no better than quote the remarks of H. C. Sherman<sup>11</sup> in a discussion of his paper on "Some Recent Advances in the Chemistry of Nutrition." His statement follows:

"Dr. Wilder raised the question of the possibility of frequent occurrence of what I think he called incipient cases of vitamin deficiency. I shall not attempt to discuss that as a clinical question; it would be out of my sphere. It might be of interest to note what the laboratory experimentation on animals that can be kept under dietary control throughout the whole life cycle, and when desirable through successive generations, indicates on that point. It indicates clearly that with respect to vitamins A, C and G the optimal intake is far above the amount which can be definitely proved to be necessary, as judged by the development of the symptoms. That is, to enable the individual and its offspring to do the best requires far more of vitamin A, C and G than the amount that is required to prevent the appearance of any of the typical symptoms of the deficiency disease. The recent work on the relation of vitamin C to teeth shows that, for the complete protection of the teeth, twice as much vitamin C is required as for the prevention of the longer known symptoms of scurvy. The work of Mellanby and Green shows that to get the full anti-infective effect, whatever that may be, of vitamin A, requires about four times as much vitamin A as is required to prevent the characteristic symptoms of vitamin A deficiency. In our own laboratory, experiments just completed and not yet published indicate that at least twice as much vitamin G gives improved condition in nutrition as the amount required to prevent the

signs of vitamin G deficiency; so that, with respect to all three of those vitamins, the laboratory evidence is in the direction of an affirmative answer to the clinical question which Dr. Wilder raises. Whether it should be called latent vitamin deficiency or not, there are undoubtedly a great many persons not showing the characteristic signs of vitamin deficiency but who would do better if they got more of one or another of those three vitamins."

The comparatively recent recognition of the value of liver and stomach tissue in pernicious anemia, the discovery of the stimulating effects of peaches on red blood cell regeneration, the finding that copper and manganese are probably as essential as iron for hemoglobin regeneration; these and many other recent discoveries clearly demonstrate the great advances made within the field of food therapy.

Whatever may be our views as to the sufficiency or deficiency of our present day diet, let us not close our minds to the possibilities of improvement. Heinrich Willi,<sup>12</sup> in a detailed report on the effects of different diets on himself, found that on an uncooked vegetable, high caloric, low salt diet for ten weeks, he felt better and experienced less fatigue than while on a high protein diet consisting mostly of animal food. On the raw vegetable diet, however, he lost weight, was somewhat anemic, and his blood pressure fell from 122/65 to 90/45. On the animal diet, these factors showed no marked variation from the ordinary, but he suffered from unquenchable thirst and severe constipation. Such experiments suggest to us the need for detailed investigation in order that we may strike a balance that will give us what McCollum and Simmonds have called "optimum nutrition." Who knows but that the future may bring to the physician the tired and overworked business man with the request that he be given a diet which will provide for him the greatest amount of vitality for the carrying on of his strenuous work. To do this, the physician must be a live student of nutrition, well versed in the relative values and proper quantities of fats, carbohydrates, proteins, vitamins, minerals, and whatever else that may come to be. He must be able to combine food-worth with practicability—that is ease of purchase for the patient—and must ever keep in mind the virtue of palatability.

In view of the extensive experimental research work showing the relationship of the food factor to faulty bodily development, infections, lowered vitality, early fatigue, and other disturbances, it

would seem warranted that a more thorough consideration be then given to the ordinary person's diet, attempting to determine any possible deficiencies present. Only by diligent study, careful observation and intelligent practice can we hope to give to the patient that which will do him most good in the field of nutrition. If, by the proper attention to this aspect of the average person's life, we can give to him a more vigorous and useful life then we have done much to advance progress. McCollum and Simmonds referred to this possibility when they said that there are many people who die at 45 years of age who are not buried until they are 80. More important than living long is living well; then and only then will life be complete.

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## Significance of Diet in the Practice of Medicine\*

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**A**TTEMPTS to cure disease by diet are as old as medicine. Dietotherapy occupied as prominent, if not a more prominent place in the armamentarium of the ancient and medieval physician and charlatan as it does in those of the modern day. The significant point, however, is that today the use of diets in medical practice is on a much more rational and scientific basis, although much is to be learned, many facts accumulated and knowledge disseminated. In the absence of convincing scientific data, and even frequently in its presence, much of dietary therapeutics is still empiric. Such diets have largely arisen by a method of trial and error never adequately controlled. It must be admitted that some empiric diets undoubtedly possess reasonable merit, but the majority are in large part useless, and, unfortunately, many of these have become fixed in the minds of laymen and are passed by word of mouth or the cheap press from generation to generation. It will require prolonged and wholesale education and re-education to adjust many of these erroneous fixed notions and replace them by accurate facts based on scientifically evaluated data.

The facts that man must eat to live, that a variety of foods is usually available for selection, and that man has a natural bent for curiosity

and exploitation, combined with the lack of statutory control of dietary practice, have largely been responsible for the development of fads in diets, previous and present.

It is as yet impossible to classify completely those diseases in which dietotherapy is of importance. However, these conditions may be delineated into groups such as those in the tabulation. This table is not exhaustive, and will undoubtedly become out of date with advancement of knowledge.

It is impracticable to consider in a short space many of the important dietary features of the conditions mentioned. Therefore, what follows will include only a few of the recent developments and experiments in relation to certain of these diseases.

### DEFICIENCY DISEASES

It is obvious that in relation to dietary needs the deficiency diseases are the most prominent, since they occur as a direct result of the absence of certain food factors in the diet. Of these, the most popular at present are the vitamin deficiency diseases.

*Vitamins*—The average American dietary is apparently adequate to prevent the development of dietary deficiency diseases. It is only under unusual circumstances in this country, such as war, famine, and floods, that actual de-

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iciencies are likely to develop, with the exception of rickets (and pellagra in the South).

Since most physicians are aware of the vitamins and diseases produced by their lack, it will be unnecessary to consider them fully. There are, however, three points which seem of significance in relation to vitamin consumption, and which should be emphasized:

1. The amount of vitamins which should be included in the diet. While we do not know the actual requirement of each vitamin needed daily, the optimal amount is probably very small, and the experimental data of Sherman indicate: "It seems true of vitamin G, as also of vitamins A and C, that the optimal amount is much higher than the minimal ('actual') requirement; that is, that the body is able to make good use of a much more liberal intake than can be proved to be absolutely necessary." This conception is of fundamental significance, and applies not only to vitamins, but probably to other foodstuffs as well. The capacity of the body to store certain vitamins, such as vitamin A, allows more freedom in considering its content in the diet over short periods of time than in the case of vitamins B and C, which are not stored, and the supply of which must be constantly obtained from the food intake. We can only hope that this same result will apply to nutrition of man, and yet we must be patient and conservative, for, as Sherman also points out: "One of the most impressive features in recent discoveries regarding the relations of food to health and vitality is that the benefit of better feeding usually becomes fully apparent only when it is continued throughout a larger part of the life cycle, and often the benefit is greater to the second generation than to the first."

Although vitamin deficiency diseases may not be common in this country, vitamin deficiency states may exist, and it is readily conceivable that many who are ingesting enough of the vitamins to keep them from getting a deficiency disease are only in a "passable" state of health, whereas a larger supply of vitamin-containing food might give them a state of "bouyant" health.

2. The relation of vitamin A to infection. The questions of whether a normal supply of vitamin A gives an individual greater resistance to infection than an inadequate supply, and more important, whether an excessive supply increases the resistance of the individual over that of the normal, are exceedingly pertinent. Although evidence has been offered to

affirm these two questions, conservatism leads one to say that at present vitamin A is to be considered as a substance protecting against infection by virtue of the fact that it maintains the integrity of the epithelial linings of the various tracts of the skin, but its anti-infective power, that is, its ability to cure infection when the barrier of the covering tissues has been passed, or to prevent or cure infections in the blood stream, is questionable and still a matter of controversy.<sup>13</sup> The most recently discovered source of vitamin A is halibut liver oil, which is much richer in this substance than is cod liver oil.

3. Pellagra, while endemic in the South, also exists throughout other parts of the country. The astute clinician will be on the lookout for pellagra among older persons who may have organic gastro-intestinal disease, or who are "fussy" in their dietary<sup>14</sup> habits.

*Pernicious Anemia*—Pernicious anemia and certain forms of secondary anemia are probably due to dietary deficiency and may be controlled by adequate regulation of the diet. In addition, certain forms of secondary anemia apparently not strictly due to dietary deficiency are in part relieved by dietary treatment.

*Other Forms of Anemia*—Certain forms of secondary anemia are well recognized as being due to dietary deficiency. The exact deficiency is not always obvious, but, as Minot has suggested, factors of significance may be lack of an ingredient necessary to the manufacture of a specific molecule, failure of supply of enzymes, lack of certain elements, such as iron, calcium, iodine, and perhaps copper, insufficient amounts of certain components of food, or an oversupply of certain food factors. Careful study of each individual case is necessary, and the therapist should consider: (1) those substances which, from experimental evidence, should be useful, that is, liver, kidney, beef muscle, gizzard, sausage, apricots, peaches and prunes; (2) a diet rich in vitamins containing vegetables and fats, with cod liver oil, yeast, liver and ferric citrate daily, as reported clinically by Conner; (3) fetal liver and bone marrow, as cited by Giffin and Watkins, and (4) as Minot stressed, it is important to use sufficient amounts of the various substances. Very large amounts may be necessary.

#### DISEASES OF METABOLISM

*Obesity*—The prevention and treatment of obesity are exceedingly important in modern medical practice. There is still considerable

controversy concerning the nature of obesity. Cases may still be divided into those due to exogenous and endogenous causes. Among the latter are those which result from endocrine or cerebral disturbances, and their dietary treatment will not be further considered here.

It is perhaps generally believed that exogenous or simple obesity is the result of overeating and all that this implies. However, as Wilder has recently pointed out, this may not be the whole explanation. Many thin individuals undoubtedly consume excessive amounts of food, which it seems would make the nutritional balance favorable for a gain in weight. Other individuals who consume apparently less food are rewarded or, perhaps, punished by gaining weight steadily. The exact reason for this discrepancy is not clear, but it seems reasonable to reconsider, as emphasized by Wilder, the old theory of *luxus consumptionis*. This theory held that there was a burning up of food to rid the body of undesired excess. It may be that the individual who is obese has lost partially or completely this power of *luxus consumptionis*, and instead of burning undesired excess, stores it in whole or in part as fat.

The fundamental features of the treatment of obesity are not altered by these conceptions. The underlying principle is that of restricting the intake to a level below the caloric requirements of the individual. Methods of determining the caloric requirements of an individual, and suiting a diet to this purpose, are relatively easy and require only brief mathematical calculation, with the additional care that adequate amounts of protein and vitamins are used. Almost as important as a consideration of the caloric requirement of the diet are the secondary features, which are described by Wilder as follows: "The intake must be curtailed and the chief problem, then, is how to accomplish this with a minimum of discomfort and without injury. The technic of the procedure is exactly like that which is followed in the treatment of diabetes. The patient must be trained. Without his intelligent co-operation, nothing happens. He also must want to reduce, and he must understand how to do it. It is usually wiser, the ultimate results being better, if weight is lost very gradually. A too rapid reduction may impair strength of heart or nervous system, the patient feels uncomfortable, loses confidence, and stops the treatment. Reduction which requires more time results in establishing new food habits, so that

afterward the patient finds himself able to hold his new weight without conscious effort. In some cases, it seems as though prolonged dieting restores to normal the ability to metabolize food in excess of requirements; that is, the *luxus consumptionis* referred to above, so that previously forbidden sweets and fats can be indulged in again without gaining. A weight loss of two pounds a week is as much as should be sought, and one pound is quite enough after the first ten or twenty pounds have vanished."

#### DISEASES OF THE LIVER AND BILIARY TRACT

There is no adequate diet for the treatment of chronic cholecystitis, although some patients will be benefitted symptomatically by the avoidance of fatty and rich foods, which apparently call on the gall bladder for release of bile. We have advanced sufficiently in knowledge of diseases of the liver to know that diets high in carbohydrates are protective for the liver, particularly in cases of obstructive jaundice, cirrhosis and hepatitis of all types. The experimental studies of Bollman and Mann have also suggested that in cases of hepatic disease in which ascites is present or may develop, a low protein value in addition to the high carbohydrate content is desirable since under such circumstances of disease ascites has been precipitated by a diet high in protein in the form of meat. Bollman and Mann have shown that the active principle seems to be the water-soluble extracts of the meat. Proteins of milk do not favor the production of ascites.

#### INTESTINAL AND COLONIC DISORDERS OF FUNCTIONAL ORIGIN: CONSTIPATION AND DIARRHŒA

In this connection some interesting experimental results of Childrey, Alvarez and Mann are worthy of note and they have applicability also in the functional disturbances of the stomach. These investigators were able to show that the combination of certain foods helps or hinders digestion, as for example the combining of bread and milk and raw egg and milk improved the digestion of both substances. Similarly meat was better digested when given in lumps than when given finely comminuted. Foods taken in a large amount were better utilized than when taken in several portions at half hourly intervals. Food eaten on the day following the ingestion of certain substances (cheese and lard) were found to be imperfectly digested. If the intestine is over-

burdened and overwhelmed on one day, it will not digest well on the next. One can only hope that some of these facts apply to man as well as to the dog, and that eventually knowledge concerning them in regard to man will be more accurate.

Individuals with diarrhea of unknown origin require great care in their diet. Brown suggested: "Well assorted adequate food administered as rapidly as is consistent with the patient's tolerance, is the goal to be achieved for chronic diarrhea of unknown origin," and added, "Far more harm is done by a diet too limited than by one too free."

The only statement to be made in regard to dietary care of constipation is in the use of bran. Alvarez reviewed the opinions of 470 physicians concerning the advantages and disadvantages of bran and roughage, and concluded that the questionnaire "has shown clearly that the physicians of this country are not enthusiastic about the use of bran." Almost all agreed that the present propaganda for the addition of roughage to the diet has been more harmful than beneficial.

#### DISEASES OF THE CARDIOVASCULAR RENAL SYSTEM

It is impossible to state clearly the problem of diet in these diseases in a short space. There is at present so much controversy concerning the value of a diet high in protein in nephrosis, a diet low in protein in nephritis, a salt free diet in nephritis, cardiac disease and hypertension, and the importance of the acid and alkaline ash foods in the treatment of these conditions, that one finds it difficult to know which way to turn. The difficulty is the result chiefly of tradition plus the lack of accurate control studies and failure to observe patients long enough. Not only must the nature of the underlying disease be considered, but the stage to which it has advanced.

The dietary treatment in cases of essential hypertension is relatively simple. It is highly desirable that the food be simple and non-irritating, and the amount of the feeding relatively small. Restriction of water, and particularly of salts, has its advocates, but in the absence of sufficiently convincing data it hardly seems worth while to ask a patient to continue the use of a salt free diet, which is almost tasteless.

Care of the diet for nephritic patients has almost always been built around the diet low in proteins and salt. Recently McCann and Keutmann have fed to a group of nephritic patients in the latent and chronic active stage

of hemorrhagic Bright's disease, food high in protein without apparent bad effect; in fact, there was some clinical improvement. It seems reasonable that in a carefully studied case of nephritis, individual consideration may show it desirable and apparently harmless to enlarge on the protein elements of the diet. McLester has recently advocated diets with a protein content of 150 gm. daily in cases of chronic Bright's disease, as more nearly correct than the usual restriction to 40 to 50 gm. He suggested that the adult with nephritis take a quart of milk, two eggs and one large serving of meat daily, and that for economy in nutrition carbohydrates should supply at least 50 per cent of the calorie value of the ration. This advice is given because of the important anabolic influences of protein, its upbuilding effects and beneficial influences on repair processes. In the absence of edema, salt restrictions should not be too rigid.

Although a relatively high protein diet (2 gm. or more of protein for each kilogram of body weight) does not always raise the low level of serum protein of the blood of patients with nephrotic edema and albuminuria, nevertheless diuresis may be precipitated and the edema disappear. It seems logical to use such a diet in these cases in the absence of renal insufficiency.

#### DISEASES OF THE TEETH

Brief mention must be made of recent researches along the line of prevention and treatment of dental diseases by diet. Such researches are of fundamental importance, and they should receive the widespread attention of all physicians, dentists and public health workers. The work of Mellanby and her associates in England has been outstanding. Editorial Comment in the *British Medical Journal* summarizes briefly the result of ten years of this study of the effects of diet on dental caries, as follows: 1. Deficiency in vitamin D caused maldevelopment of the teeth, and deficiency of vitamin A caused maldevelopment and predisposed to infection of the gums in dogs. 2. These measures applied to the prevention of dental caries in children showed that the addition of cod liver oil to children's diet had a pronounced effect in retarding and arresting the progress of dental caries. 3. At the same time it was found that the addition of oatmeal to an ordinary diet favored the spread of dental caries, as had been noted by other observers also. 4. Finally, that in a

group of twenty-two children a diet in which cereals, such as bread and oatmeal, were replaced by potatoes, vegetables and milk and a full supply of vitamin D given, almost complete arrest of both incidence in spread of dental caries occurred during an observation period of six months. In other words, it appears that a diet high in cereals may be productive of dental caries, regardless of an accompanying high intake of vitamin D. This supposition is further substantiated by the remarkable report of Surgeon Lieutenant Commander Sampson on the dental condition of the inhabitants of the Island of Tristan da Cunha. In this isolated community of 160 people on an island in the South Atlantic, the use of tooth brushes is unknown, and yet the teeth are almost perfect and pyorrhea was present in only two islanders, neither of whom was a native. Rickets was absent also. The peculiar cereal-free diet of these individuals seems to be the only reasonable explanation for their remarkable freedom from dental defect. It is worthy of comment that more than 35 per cent of the total nourishment of white man is made up of cereals. Vitamin C is apparently also necessary for proper development of the teeth.

#### DISEASES OF THE JOINTS

The diets used in the treatment of rheumatic diseases are almost numberless and because of the chronic nature of the disease, the various etiologic hypotheses regarding it, and the variable chemical and biochemical results of studies concerning it, all varieties of foods and diets have found use, and many are at present finding use.

The diets most widely used today for the treatment of chronic atrophic arthritis are: (1) a high calorie, full diet; (2) a low carbohydrate diet with or without colonic irrigation, and (3) a high vitamin B diet. At The Mayo Clinic arthritic patients, under the direction of Hench, receive a high vitamin, high caloric, anticonstipation diet in cases of chronic infectious or atrophic arthritis, in an effort to raise the general resistance of the patient who has lost weight and strength. If patients are overweight or require dietary care for other reasons, such a diet is suitably modified. The dietary care of the patient with arthritis, therefore, depends on the particular characteristics of his condition, for, as Hench says, "There is no special diet for the disease apparently, but there is a diet for an individual with the disease."

#### DISEASES IN WHICH DIET IS SUPPORTIVE

The pendulum of dietary care of the tuberculous patient is swinging away from the side of

overfeeding, as indicated by the summary of Hawes following his questionnaire to leading experts. He stated that lunches between meals are rarely advisable and egg-nogs not desirable, particularly because their prolonged use is likely to cause indigestion. One quart of milk daily, a glass with each meal, is sufficient. No special foods need emphasis, the bowels should move regularly once daily, and rest before and after meals is particularly desirable.

In no other branch of dietetics is the art of medicine more important or the science of medicine perhaps less significant than in the treatment of the convalescent patient who has no appetite, who dislikes many foods, and yet who needs the tissue-building and energy-giving value of sufficient nourishing food.

#### CONDITIONS IN WHICH DIETS PRODUCING ALTERATIONS IN NORMAL BODILY CHEMICAL REACTIONS INFLUENCES DISEASE

In no other group of diseases which have significant dietary treatment is the modern science of nutrition and chemistry more outstanding than in this group. The very fact that it exists is a tribute to the work of many scientific investigators. To alter normal bodily reactions and favorably influence disease by persistent changes in the diet is a gratifying practical result of the application of principles of biochemistry, and its future seems bright. Two groups of diseases will be considered: (1) epilepsy, migraine, and urinary infections which have been treated by use of the ketogenic diet, and (2) the allergic conditions treated by elimination diets and occasional desensitization.

*Epilepsy*—Idiopathic epilepsy is such a distressing and disabling condition that any reasonable treatment which offers hope for even an individual case is worthy of trial.

The ketogenic diet for the treatment of this condition was first suggested by Wilder as more suitable than the fasting regimen which had previously been shown to be temporarily effective by Guelpa and Marie, and by Geyelin. It was Wilder's belief that the favorable action on the convulsive seizures by the ketone bodies was due to the fact that aceto-acetic acid (diacetic acid) should act pharmacologically as an anesthetic. Other workers have expressed the belief that the action of this diet in part at least was due to its dehydrating effect or because of some alteration in the acid-base balance. More recent experiments by Keith have served to bring experimental evidence to substantiate the original hypothesis of

Wilder, as do also some experimental studies of epileptic patients by Byrom.

For details of the determination of the construction of a ketogenic diet, the reports of Barborka may be consulted.

Ten years' experience with the diet for children with epilepsy at The Mayo Clinic revealed 36 per cent of a group of 160, concerning whom sufficient data were available, were well,<sup>22</sup> which means that these patients gradually assumed a normal diet and have remained free of attacks to the present date, at least a year. In 21 per cent of the group the patients are improved, and in 43 per cent the diet was definitely a failure. In a report concerning 100 adults similarly treated, Barborka found that the attacks of twelve were definitely controlled, and forty-four of the patients were definitely improved. For the remainder the diet was a failure.

Several features concerning this diet must be pointed out. It requires unusual intelligence and co-operation on the part of the patient, who must learn to follow careful instructions in dietary principles and to continue the diet over a long period of time. It is therefore not applicable in every case. Apparently children and growing adults in whom the convulsive habit is not too firmly entrenched, may have the greatest hope for success. Other measures, such as the use of phenobarbital, may be carried out in conjunction with the ketogenic diet.

*Migraine*—Because of the success of the ketogenic diet in a small percentage of cases of migraine, it seems worthy of trial in those cases in which the migraine is very severe and disabling, for any improvement will be helpful and relief will be miraculous to the patient who has suffered long and tried many forms of treatment.

*Urinary Infection (Bacilluria)*—Clark has studied and reported on fifty cases of bacilluria under ketogenic treatment. The acidifying effect of this diet on the urine warranted its trial. Clark found that of these fifty cases of infection of the urinary tract with micro-organisms in which production of hyperacid ketonurine was attempted, results were satisfactory in 66 per cent and unsatisfactory in 34 per cent. The prognosis varied with the type of organism, with the extent of the infection, with the amount of renal injury, and with the ability of the patients to produce hyperacid ketonurine. Helmholz has also reported its beneficial effect in the treatment of urinary infections in childhood and its success in freeing such patients with urinary anomalies of the infection. He presented experimental evidence that "low

hydrogen ion concentration alone, the presence of sodium diacetate or diacetic acid or their combination does not produce bacteriostasis. It seems, therefore, that acidity in synergy with substances heretofore not determined probably accounts for the bactericidal action of ketonurine." Undoubtedly this opens a new and promising field for treatment, but progress in it must be carefully surveyed and evaluated.

*Allergy*—This subject is one of the great problems of medicine at present and relatively little is known concerning it. Gastro-intestinal allergy is the type which is most readily affected by diet. The diagnosis is made according to Rowe: (1) by means of diet trial for which "elimination diets" are useful; (2) with the help of the history of food dislikes and disagreements, and (3) with the aid of any skin reactions which occur. The latter are, however, notoriously unreliable. The dietary treatment is essentially that of attempting various elimination diets such as those of Alvarez or Rowe with the hope that the symptoms will be relieved. Then by slowly adding one food after another, the offending substance may be determined and eliminated. This requires the careful co-operation of the patient, but the victory is worth the trouble if it is attained. Probably many conditions not due to gastro-intestinal allergy will be relieved by a diet as simple as many elimination diets are. Such possibilities should lead to a warranted air of skepticism by the physician, and such cases should not be accepted as proved allergic until the evidence is quite convincing. Shellfish, strawberries, pork, fish, cereals, eggs, milk, chocolate and tomatoes are common offending substances. In the way of diet it should also be mentioned that desensitization to those substances may be one form of treatment, especially if the food to which the individual is sensitive is commonly used.

#### PREPARATION OF FOODS

The question of cooked or raw foods is a perennial one. Some foods are undoubtedly more digestible when cooked. This is especially true of the starches. Clifford's studies indicate that the most rapidly digested meat is that which is roasted or grilled until it is just red inside with a moist surface when cut. Overcooking of meat lowers its digestibility but not below that of raw meat. Soft boiling of eggs enhances their digestibility, although hard boiled eggs are not as indigestible as is often supposed. The basis for the advantage of cooking food is that this process apparently overcomes an anti-enzymatic activity which many

raw tissues exert. As remarked editorially in the *Journal of the American Medical Association*: "While some uncooked fruits and vegetables are essential in a well balanced ration, man cannot subsist on such food material alone under optional conditions of physiologic economy."

#### CONCLUSIONS

In concluding this brief review, the statements of two distinguished men, one a nineteenth century seer and the other a modern authority on nutrition, are of great interest and offer stimulation for the future.

Oliver Wendell Holmes in 1861 wrote: "I cannot help believing that medical curative treatment will by and by resolve itself in a great measure into modifications of food swallowed. The effects of milk and vegetable diet, of cod liver oil, are only hints of what will be accomplished when we have learned to discover what organic elements are deficient or in excess in a case of chronic disease and the best way of correcting the abnormal condition."

Seventy years later, in 1931, knowledge had sufficiently advanced to allow Sherman to demonstrate experimentally on the rat: "On enriching this already adequate diet in certain of its chemical factors by increasing the proportion of milk in the food mixture there results an improvement in the general nutritional condition as shown by a whole series of criteria, such as more rapid and efficient growth, lower death rates and higher vitality at all ages, an increase of 10 per cent in the average longevity of adults and greater extension of the prime of life, in that maturity is expedited and senility deferred in the same individual."

Certainly much of this knowledge can be profitably applied to the nutrition of man, and when it is applied the health of the people will be greatly improved.

#### TABULATION

##### Diseases in Which Diet Is of Significance

1. Deficiency diseases.
  - \*A. Vitamin deficiencies.
    1. Xerophthalmia and associated conditions.
    2. Beriberi.
    3. Scurvy.
    4. Rickets (and osteomalacia).
    5. Pellagra.
  - B. Pernicious anemia.
  - C. Secondary anemia.
  - D. Nutritional edema.
  - E. Undernutrition.
  - F. Simple goiter.
2. Diseases of metabolism.
  - \*A. Obesity.
  - B. Diabetes.
  - C. Gout.
  - D. Hyperthyroidism.
  - E. Cystinuria.
  - F. Alkaptonuria.
3. Diseases of the organ systems.
  - A. Gastro-intestinal.
    1. Organic.
      - a. Peptic ulcer.
      - b. Carcinoma.
    - \*c. Diseases of liver and biliary tract.

- d. Diseases of the pancreas.
- e. Diseases of intestines and colon.
2. Functional.
  - a. Gastric disturbances.
  - \*b. Intestinal and colonic disturbances; constipation and diarrhea.
- B. Cardiovascular; renal.
  - \*1. Nephritis; all types.
  - \*2. Hypertension.
  3. Cardiac disease.
- \*C. Teeth.
- \*D. Joints.
4. Diseases in which diet is a supportive.
  - \*A. Infections such as typhoid and tuberculosis.
  - B. Convalescent periods following operations and infections.
5. Conditions in which diet producing alterations in normal bodily chemical reactions influence disease.
  - \*A. Epilepsy.
  - \*B. Migraine.
  - \*C. Urinary infections (bacilluria).
  - \*D. Allergic conditions.
  - E. Lead poisoning.

\*Considered in text.

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## Nutritional Research and Its Evaluation\*

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**R**EFINEMENTS in technique have advanced nutritional research at a rapid pace during the past few years. The original three vitamins, A, B and C, have been definitely expanded into A, B, C, D, E and G. The growth promoting factors in yeast originally called B and now called B and G are thought by some to be a mixture of five factors, rather than just the two so generally accepted.

Isolation and identification of the vitamins is proceeding rapidly. It is known that the yellow pigment carotene can be changed by the animal liver into vitamin A and some claims for the preparation of a pure A have been made. An inactive plant constituent, ergosterol, is readily changed into vitamin D by irradiation with ultraviolet light. Pure crystals of active substance, named calciferol, have been prepared in several laboratories and the chemistry of its molecular structure is being studied. Claims for the preparation of pure crystals of vitamin C come from both European and American laboratories, but there is complete lack of agreement as to the chemical structure of the active molecule. Antineuritic vitamin B ( $B_1$ ) has been greatly concentrated, and some workers claim the isolation of pure crystals.

The popular conception has been that nutrition workers have been largely concerned with the vitamins. This is a one-sided view. It is true that an over-emphasis has been placed on the vitamins because of their spectacular effects and because of the ease with which certain results can be obtained.

However, reports from other fields are most encouraging. Until four years ago, it was believed that animals were able to synthesize all necessary fats from carbohydrates. At the present time it seems certain that there are fatty acids which are an essential part of normal tissues and which can be obtained only from plants.

The role of minute traces of mineral elements in nutrition is one of the most promising fields for future investigation. During the past 15 years plant physiologists have definitely established the fact that many species of plants require traces of such elements as copper, boron, zinc and manganese. It has long been known that iodine is an essential constituent of the diets of animals. Although as little as 100 parts per billion is sufficient to protect from goitre, nevertheless this amount is not obtained from vegetable diet in some regions of the world where plants thrive in soils almost devoid of available iodine. Until recently there was no conclusive evidence that such elements as copper, boron, zinc and manganese would benefit animals if included in their food. However, it has just been reported that there are soils in the Florida Everglades which are so lacking in copper that plants do not thrive and, furthermore, animals which consume these plants likewise show signs of malnutrition.

An insight into the role of copper in metabolism is given by the work done on anemia. Nutritional anemia is easily produced in rats when fed a whole milk diet. Addition of iron alone to this diet does not cure the condition. But a further addition of less than .05 milligram daily of copper produces rapid hemoglobin regeneration. This is a complex problem. Recent investigations show that the copper does not aid iron retention, but it takes iron from the tissues and puts it into hemoglobin.

A careful comparison of results obtained with different food regimes shows that the composition of the diet, that is, the protein, carbohydrates, fat and salt content, materially affects the requirements of the animal for certain vitamins and minerals. The following examples are typical cases. It is impossible to produce rickets in rats through the absence of vitamin D if the calcium and phosphorus of the diet are high and well balanced. The severity of rickets produced increases with the lowering of these salts in quan-

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tity and with the unbalancing of their ratio. There is evidence, also, that certain cereals predispose the animal to rickets.

Almost from the time of its discovery vitamin B has been suspected of being involved in carbohydrate metabolism. Those diets which most readily produced beri-beri or polynutrititis were high in starch, as for example polished rice. It was shown that pigeons live without vitamin B much longer on a fat diet than on a high carbohydrate diet. These findings have been recently confirmed with the rat in an extensive series of experiments. Yet when an attempt was made to show that glucose tolerance was lowered by the absence of vitamin B, conflicting results were obtained, the latest report indicating that there is no real relation between this vitamin and glucose tolerance. The reason is obscure why rats lacking vitamin B live longer when they consume more fat.

In the study of vitamin E it was found that the degree of sterility of female rats depended largely upon the amount of fat in the diet. Receiving only traces of vitamin E, rats remained fertile for half a normal life time when they consumed a high carbohydrate diet. But when 20 to 30 per cent of fat was added to the diet the rats were sterile at the time of first mating.

It is possible that even the iodine requirement of an animal depends somewhat upon the composition of the diet. With both the rat and the tadpole it has been shown that the effects of high iodine doses can be largely offset by the consumption of fat. Similarly the effects of large doses of dry thyroid are diminished if a high fat diet is fed.

The above are convincing examples that the diet as a whole must be considered in the interpretation of nutritional experiments and observations. They make it clear that the field of nutrition should not be subdivided into the vitamins, the salts, the proteins, etc., but it should be treated as a whole and the results interpreted with respect to nutritional physiology.

Is this highly specialized research on vitamins A, B and C of practical value in a country which, like the United States, is remarkably free from such definite syndromes as beri-beri, scurvy and xerophthalmia?

The answer to this question is found in the literature relating malnutrition to general vigor and resistance to infection. Although the human being ingests enough of the essential proteins, fats, vitamins and minerals, with a random selection of his diet, to prevent those symptoms which can be diagnosed by the clinician as under-nutri-

tion in any specific factor, nevertheless he may be sub-normal in vitality and resistance. This opinion is growing, based upon many experiments and observations.

For example, the lack of vitamin A often seems to affect vitality long before growth is retarded or xerophthalmia occurs. Experiments with laboratory animals clearly indicate that lactation is poor when vitamin A is low. Extended studies of tissues of rats maintained on a diet low in vitamin A have shown a general drying out and keratinisation of epithelial tissues. This condition predisposes to infection an animal which is outwardly normal. Clinicians have reported many spectacular cases of gain in weight and general vigor by patients when a rich source of A like cod liver oil was added to the diet.

Vitamin C furnishes another excellent example of this type. Much work points to the conclusion that a sub-optimal intake of this factor increases the frequency and extent of tooth decay. By a new and more precise method of testing, it has been shown that of a group of apparently normal country school children in Sweden, 18 per cent were suffering from vitamin C under-nourishment. This is an excellent bit of evidence that if future generations are to grow up sound in every respect, it must be known that their diets are adequate. An outward appearance of health is not a sufficient test.

Furthermore many investigations have firmly established the importance of vitamin D in formation of strong, sound teeth and bones and evidence is accumulating which shows that many children do not receive enough vitamin D or sunlight to give them optimum conditions throughout the year.

A good example of the protection given by a well-rounded diet is taken from Orr, MacLeod and MacKie. The table compares the incidence of infectious disorders in two East African tribes. One consumed a poorly balanced cereal diet while the other used meat, milk and raw blood.

INCIDENCE EXPRESSED AS PERCENTAGE OF ALL ILLNESS RECORDED

	On Cereal Diet	On Animal Diet
Bronchitis, Pneumonia, Etc. ....	31	4
Tropical Illnesses .....	33	3
Phthisis .....	6	1

The above examples are sufficient to establish the value of intensive research in nutritional physiology in order that we may find those diets and conditions which will not only protect man from obvious diseases, but will bring to him the greatest possible vitality and resistance to infection.

## Which Are the Indigestible Foods?\*

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PHYSICIANS often say to patients, "Be careful about your diet, and don't eat any indigestible foods." Now just what is the patient to understand by that? Or what does the physician mean? Ordinarily, if pinned down, he will probably say: "Avoid greasy and fried foods, pastry and meat." Perhaps also he will prohibit those articles of food which he himself cannot eat or which the patient has already learned to avoid. Most persons with indigestion are somewhat afraid of cucumbers, cabbage, apples, onions, berries, shell-fish, pork, beans, pickles and other sour foods, and Welsh rarebits.

The question will then be asked: But why are these foods indigestible? In the first place many of them like celery, pineapple, oranges, raisins and nuts are full of woody cellulose which cannot be dissolved in any way in the digestive tract. This cellulose encloses starch in little envelopes and interferes with its digestion. Other foods like spices and pepper and mustard are irritating to the intestinal mucous membrane. Others, like beans, cabbage and peanuts contain some irritating substance which leads to the production of gas in the bowel. Mellons and cucumbers appear to contain some mildly emetic substance which tends to reverse the gradient of peristalsis and to cause regurgitation and heartburn. Other foods such as the green fruits contain cramp-producing and laxative substances, and others like wheat, eggs and milk, shell-fish and berries will occasionally offend in an allergic way and will produce soreness in the abdomen, flatulence, hives, headache, or irritation of the colon. Some foods like mushrooms and mussels contain at times violent poisons, and meats and fish may contain harmful bacteria or bacterial products. Fats often offend probably because they tend to produce stagnation in the stomach, and perhaps because they coat over particles of other food and thus interfere with digestion. They also tend to reverse peristalsis and thus to produce nausea.

It is probable that at times the food that is tasted for hours after a meal and which is therefore blamed for the indigestion has had nothing to do with it but simply happened to become dissolved in the fat which normally floats on the

top of the liquid in the stomach, and which is regurgitated each time the patient belches.

Unfortunately, during the last fifteen years, the excitement over vitamins has caused investigators to lose sight of the factor of digestibility in a diet, and most books on dietetics barely mention the subject. Only one of the recent books has a chapter devoted to this topic, but this was written by a practicing clinician. It seems inconceivable and yet it is true that in most books one can search through chapter after chapter without finding any information on this most important subject of so adjusting a diet to a patient that he or she will be comfortable. There is much about protecting the patient from diseases like scurvy, beri-beri and xerophthalmia which the readers will probably never see, but nothing that will guide them in bringing comfort to the patients who come to the office every day. As one would expect from this deficiency in our books, we find dietitians in hospitals stuffing frail patients with rough salads and vitamin-rich foods a few days after a serious operation has been performed on stomach or bowel. Many of them seem to have become obsessed with the fear that their transient guests will succumb to some deficiency disease before they are ready to leave the hospital.

Unfortunately, the finding and identification of the foods that distress a particular patient is seldom easy. Let us say that a man complains of distress about ten o'clock in the evening; perhaps he has heartburn, intestinal unrest, and gas. Is he to blame this discomfort on some food eaten at dinner time or must he remember also what he ate for luncheon and possibly for breakfast or even for dinner the day before? No one knows. But I think most commonly he can blame the food eaten for dinner. Of course, whenever a patient is so highly sensitive to some food that he always becomes violently ill within a few minutes or hours after its ingestion, he soon learns to avoid it, but often he must remain puzzled. Not infrequently a food can be eaten with impunity in small amounts or at one meal when it cannot be eaten in large amounts or for two or three days in succession and this fact complicates the problem. Furthermore, food eaten when the patient is much fatigued or excited may cause serious indigestion

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when at other times it is harmless. Similarly a cold will often cause all foods to be digested badly for a time.

If the patient is upset only at intervals of weeks he may be able to identify the cause of the trouble by keeping a careful record of foods eaten, fatigue, excitement, and intercurrent infections. When, however, the distress comes almost every day, the search for indigestible foods must be made simpler by asking the patient to live for several days on only three or four substances such as beef, rice, butter and sugar. Rowe's elimination diets allow a little wider range of choice. If on such a simple diet the symptoms disappear it is then easy to experiment with one food at a time and thus to establish its harmlessness or harmfulness.

According to Rowe the most harmful foods are wheat, eggs, milk, chocolate, cabbage, tomato, orange, cauliflower, white potato, oats, pork, carrots, bananas, strawberries and walnuts. He based this opinion largely on skin tests which in the experience of most students of food sensitiveness (including Rowe) are not of much value. In trying to get helpful information in another way I recently asked 100 patients with digestive troubles what foods disagreed with them. In order of frequency they mentioned cabbage, apples, tomato, milk, chocolate, onions, lettuce, coffee, strawberries, eggs, meat, cucumbers, sweets, fats, radishes, cheese, cauliflower, spices, peanuts, greasy foods, corn, cantaloupe, peppers, prunes, oranges and salmon. Obviously, if Rowe and other students of allergy are correct and wheat is the commonest offender in an allergic way, then many of these patients had failed to detect and recognize their worst enemy because hardly a one mentioned wheat. So far I have not been able to find many persons in whom I could detect bad effects from the eating of wheat, but I am handicapped in making such studies at Rochester because our patients cannot stay long enough for adequate observations.

One of the most interesting discoveries of recent years is the great harmfulness of chocolate. Six out of the 100 persons questioned by me were much distressed after eating it, and ten others knew that they could not touch it without getting indigestion. It is important to know that seven out of 100 persons were badly upset by milk, and ten others could not take it without discomfort. Many physicians have the bad habit of putting all patients with much indigestion on a diet consisting largely of milk. Often it produces nausea, biliousness, and a general feeling of

poisoning, and not infrequently, when the patient objects and wants to stop, the physician insists that he continue. Actually, my experience is that in most cases the patient who can digest milk can digest just as well most of the foods which are usually included in a soft or a smooth diet.

Another curious phenomenon in medical practice is the great tendency of physicians and laymen to avoid meat in the feeding of the sick. Actually meat seems to have been the first diet of man and the one for which his digestive tract was mainly designed; it seems to be easy of digestion, and it leaves almost no residue with which to irritate or burden the colon. At any rate, in twenty-seven years of practice I have learned to rely on meat in the feeding of the sick, and particularly in the feeding of those persons who have a sensitive colon or who are suffering with diarrhea.

There can be no doubt that a more careful study of many of the patients now leaving the offices of gastro-enterologists with a diagnosis of nervous indigestion will show that the flatulence and indigestion complained of are due to the eating of one or more harmful foods. Unfortunately the search for them is difficult and success must depend largely on the intelligence of the patient and his willingness to co-operate.

The more I study the problem the more I am impressed with the fact that food eaten with impunity one week may cause much distress the next. The ability of the mucous membrane of the small bowel to handle food with comfort and to absorb the end products of digestion is easily upset in many persons. It may be upset by an oncoming cold, or its functions may be weakened temporarily or almost destroyed by painful emotion or fatigue, or by the eating of some indigestible food. If when this happens the patient will first fast for a day, and then begin eating small amounts of low residue foods such as beef, mutton, and rice, he will soon be straightened out and able to eat anything again. But if, with a weakened and possibly somewhat inflamed intestinal mucosa, he continues to eat, and particularly if he eats large amounts of food or large amounts of roughage, he will set up a vicious circle which can be interrupted only by a period of fasting or semi-starvation. I have reason to believe that much of the indigestion that we physicians puzzle over day after day is due to this type of vicious circle which is set going by colds or by eating under unfavorable psychic conditions, and is kept up by overeating and the taking of much rough food.

## SUMMARY

More careful study of many patients would show that much of their abdominal distress is due to the eating of foods to which they are sensitive. The patient who knows of his sensitiveness to one or two foods is particularly likely to be

eating other foods the harmfulness of which he has not yet discovered.

When the mucous membrane of the bowel is badly irritated and its function deranged the best treatment is a day of starvation followed by several days of light diet. If these precautions are not taken a vicious circle is likely to be set up.

## Infant Feeding\*

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INFANT feeding twenty years ago was a bugaboo for the general physician. This is easily explained. The infant mortality rate had been very high, diarrhoeal diseases heading the list. Breast feeding was rare. Propaganda by manufacturers of "baby foods" had almost convinced mothers that maternal feeding was not the best, even highly improper. Complex methods of modifying cow's milk to approximate breast milk, resulted in the cumbersome percentage feeding of Roach and his school. Then German investigators attempted to solve the problem of diarrhoeal diseases and malnutrition by chemical formulae and the caloric content of feeding mixtures. What with percentage figures, calories and chemical equations, confusion arose and feeding a baby became a formidable task. However, during the past two decades, infant feeding has been debunked so that today it is a simple, common sense task. We are referring to the normal child and exclude a few conditions, as illustrated by Celiac Disease, which are rarities in one's general practice.

The course of this transition is very interesting and a short review of our progress may prove helpful.

1. As standards of milk production and distribution were raised, diarrhoeal diseases decreased. Certified milk was a big factor. Then as the prejudice against pasteurizing and boiling milk was overcome, the infant mortality rate continued to fall.

2. The campaign of J. P. Sedgwick in emphasizing the feasibility and ease of breast feeding was of enormous importance. Now mothers want to nurse their babies and are convinced it is the easiest and best way.

3. Our knowledge of vitamins has done much to simplify infant feeding. We learned that some

bad nutritional states were due to deficiency of one or more vitamins and how this lack could be overcome. One of the greatest boons was to find that foods could be rendered safe by heating, and the vitamin C deficiency made up by using orange juice or other antiscorbutic. This at once popularized pasteurizing or boiling of milk, cut down summer diarrhoeas enormously and completely wiped out scurvy.

4. Marriott further simplified the problem with the dictum that the infant would thrive on almost any simple food if it were provided in palatable form, free from pathogenic bacteria and of concentration such that the child could hold enough to cover its caloric needs. Von Pirquet proved that infants, even newborns, could thrive on whole cow's milk, fortified with 5 per cent to 15 per cent granulated sugar. The age-old theory of high dilutions of cow's milk and sloppy mixtures on which babies starved, has been thrown overboard.

Now, as to some scheme of infant feeding. The food should contain necessary ingredients, protein, carbohydrates, fats, mineral salts, vitamins and water in suitable proportions, to promote growth and normal development, usually milk in some form, modified, evaporated, dried or even synthetic. There are many types of feeding to choose from and it ill becomes one to be dogmatic in the choice. Ten physicians may feed ten babies with ten different foods and all have excellent results. Our own scheme is simply one which we are accustomed to use, which gives good results. It is not presented as a model. However, it will serve to illustrate certain principles which are of importance.

Given a normal infant, we endeavor to breast feed the baby and succeed in the great majority of cases. We use the 4-hour intervals, five feedings in the 24 hours, not to exceed 20 minutes

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at the breasts. On this schedule most babies are fully content and it is easier for the mother. Occasionally a baby will appear to have a gastric capacity insufficient to carry it four hours with comfort and we resort to the three-hour interval. Whatever the interval of feeding, due regularity is important. If the mother's breast supply is inadequate, as evidenced by an unhappy baby and lack of sufficient gain in weight (5 to 8 ounces per week), we use what breast milk she has and complement with some artificial mixture immediately after nursing.

For complementary or full artificial feeding what shall one use? I have already indicated there is a choice of many foods with varying combinations. For the sake of simplicity and economy we have continued the use of milk, water and some type of sugar. In the first month we use  $\frac{1}{2}$  milk plus  $\frac{1}{2}$  water plus 5 to 10 per cent dextri-maltose. We find out students have difficulty in understanding percentage of sugar. It is, however, simple. In speaking of percentage, we mean the full amount of the mixture. A quart of the feeding mixture is approximately a thousand grams; therefore, 5 per cent sugar would mean 50 grams of sugar to the entire feeding. Now a tablespoonful of Dextri-Maltose weighs  $7\frac{1}{2}$  grams and 50 grams would be approximately 7 level tablespoonfuls. Granulated sugar is twice as heavy as Dextri-Maltose, a tablespoonful weighing 15 grams. Now a 10 per cent granulated sugar in a quart of mixture would be 100 grams, or  $6\frac{2}{3}$  level tablespoonfuls. As the infant grows older, we more or less rapidly increase this to  $\frac{2}{3}$  then  $\frac{3}{4}$  milk and at 5 to 7 months, whole milk. Whatever the mixture, it is *boiled 2 minutes*. Do not worry about the loss of vitamin C and scurvy. A greater cause for worry should be the possibility of diarrhoeal disorders in the use of raw or imperfectly pasteurized milk. Of course, we choose the freshest, cleanest milk procurable, with a butter fat content of around 3.5 per cent. Nearly all babies will handle such mixtures satisfactorily. Occasionally a baby will respond with frequent stools containing large curds, and much crying-colic. This infant may be much more comfortable on a protein milk formula. Again, the response may be excessive vomiting. Some combination of whole and skimmed lactic acid milk may solve your problem; or again, a baby may develop eczema; a fat poor feeding of buttermilk mixture or skimmed lactic acid milk may give relief from this troublesome symptom. As to the type of sugar to be used, again there is a choice—milk sugar, granulated sugar, Dextri-Maltose or

corn syrup. In the presence of excessive fermentation and loose stools, either of the two latter sugars are better tolerated. There are many foods, several sugars and a great variety of combinations of these which can be used, provided the mixture is free from pathogenic organisms and of concentration such that the baby can hold enough to cover its caloric requirements. In a young child palatability is of minor importance. However, simplicity and economy features are recommended.

How much food shall the baby be given? Here perhaps lies the most frequent error in infant feeding. At last the sloppy mixtures of much water, a little milk and a pinch of sugar have been discarded and a greater concentration of feeding mixtures has been accepted, and still babies are often underfed because of small feedings. An inkling of the amounts demanded may be gained by observing a normal baby with access to an abundant breast supply. At 2 to 3 months of age, such an infant may take 3 to 4 ounces at one feeding and 7 to 9 ounces at another. One cannot help but be impressed with the variability of the amounts of the feeding and the enormous quantity taken at some feedings. Therefore, give the baby what it will take at regular intervals. The baby's determination of quantity required is a better guide than a doctor's theory. The time element is also of importance. See that the opening in the nipple is such that the baby can get the desired amount in 10 to 20 minutes.

How about vitamins? If the infant is on a food which has been treated by heat (pasteurized or boiled) the supplying of vitamin C is of importance. Introduce strained orange juice or tomato juice at the end of the first month in small amounts, and increase presently to 1 ounce daily. In our north temperate zone, a baby born at the time of year when it will be deprived of sunshine for months, and in general all babies by the age of 6 to 8 weeks, should get some anti-rachitic substance, such as cod liver oil or viosterol. Better still, give both, since viosterol is not a substitute for cod liver oil in that it lacks vitamin A. Although there is little vitamin A deficiency in the average dietary of our people, there is evidence to show that an abundant supply of vitamin A helps to ward off upper respiratory infections. In the state of our present knowledge, the dosage of these substances is rather empirical, but it is best to give a reasonable excess rather than too little. The knowledge that sunshine is a powerful anti-rachitic has not been fully utilized. At the appropriate season, babies should have sun

baths. The technique is simple. However, sunshine is potent both for food and ill; a little sunshine is far better than too much.

At 5 months of age, we introduce cereal into the diet. Why at 5 months? We do not know, but it succeeds. It might be introduced earlier or later, perhaps, with equally good results. We begin with a thick, well cooked refined wheat cereal and introduce others later; the quantity small to begin with and increased during a month to 3 or 4 tablespoonfuls twice daily before the milk feeding. Green vegetables are introduced at 6 months. Doubtless vegetables could be given earlier. However, we have a definite indication for the use of vegetables not later than 6 months; to prevent the development of anemia. By this age any supply of iron with which the baby comes into the world is exhausted and it needs a richer supply than is afforded by milk. A baby fed exclusively on milk until 10 to 12 months of age is usually fat, flabby and pale. Any of the common green vegetables, well cooked and sieved, are given once a day. They are begun in teaspoonful doses and increased in one month to 3 to 4 tablespoonfuls once a day, before the milk feeding. Zweibach crumbled or softened in the vegetable water may be conveniently added at this time.

At 7 to 8 months, simple broths, puree of liver, jello, custard, eggs, cottage cheese are added to the diet and whole unmodified milk is given. Only recently it was considered a crime to give egg to an infant under 2 years of age, presumably because of certain reactions such as vomiting, urticarial eruptions and collapse symptoms. True, a baby will occasionally react with such symptoms, but fortunately rarely. On the other hand, egg furnishes iron, an anti-rachitic factor, and is an excellent, simply prepared food. At 10 months, baked potato, bacon and sweet-breads are added. Many babies will choose to go on three meals a day at this age, if given an opportunity. On this schedule the baby experiences hunger, relishes his food better and the feeding program is simplified for the mother.

One may ask why such a varied diet in a child so young? Would not a much simpler diet provide the child with all foods necessary? The answer is yes. Justification, however, lies in the fact that a baby will acquire a taste for new foods with more ease when younger. Whoever has tried to enlarge the menu of an 18-month to 2-year-old child who has been on a very narrow though adequate diet will appreciate the truth of the statement made, and again, the broader the diet the

simpler is the household task of preparing the infant's meals.

At one year of age scraped beef, lamb, mutton and flaked fresh fish are added to the diet. Why give meats so early? It has been established that the meat protein surpasses the vegetable protein for the rapidly growing child. The adult, having attained his development, may go on a vegetarian diet if he pleases, but the growing child should not be deprived of meat. With the eruption of the first molars, 14 to 18 months, sieving, pureeing and scraping of foods should be discontinued. As with acquiring tastes for different foods, so with teaching to masticate, the earlier it is started, when feasible, the more readily the child will respond. Everyone appreciates the difficulty of getting a pap-fed two-year-old over onto a solid diet. Dentists also inform us that mastication is very important in the proper development of the jaws and for soundness of teeth. At two years of age, the child should receive the general family fare with the exception of highly salted and spiced foods, rich desserts and uncooked fruits, such as berries.

A proper diet is not the entire problem of infant feeding. The most frequent presenting complaint with us is, "my child will not eat this or that," or, "will not eat at all," or, "shall I force my baby to eat this or that." In such cases the query as to how much milk the child gets elicits the response, "one to two quarts daily." For some strange reason, with the older infant, milk is not considered a food. With such a large intake of milk, there is left little space or desire for other foods. Besides, milk can be guzzled easily and speedily and there is more time for play and amusement. Above one year of age, we are in the habit of limiting the daily intake of milk to one to one and one-half pints a day. Again, an infant may take quantities of milk, not from hunger but from thirst. Therefore, from birth on, offer water freely. As with milk, the child should not be permitted an excess of one food of which he may be fond, to the exclusion of others. Try to balance the diet. Give some of many foods.

Too frequent feedings may lead to difficulties. It is a pleasure to be hungry if one does not remain in that state too long. So let the child get hungry; it will relish the food the more. This then is one of the advantages of the longer feeding interval in the early months, and the three-meal-a-day regimen at 9 to 12 months of age.

The forcing of food when the child is indisposed or ill leads also to bad eating habits. One should interpret one's own reactions in terms of

the child. If food is forced on a nauseated child he is likely to vomit it and thereby acquire disgust for the foods involved. In fact, this truth applies to the forcing of foods under any condition. The withdrawal of milk and allowing the child to go hungry until he demands food will readily over-

come the average case of "anorexia" or "bad feeder."

In a very brief way we have tried to outline a workable scheme of infant feeding. We feel it is simple and practical. The development of the diet is logical and the results gratifying.

## Nutrition and Oral Health\*

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**M**ANKIND'S two most prevalent diseases are dental caries and inflammatory conditions of the supporting tissues of the teeth (pyorrhea). These rank about equal in their effects upon the dental mechanism insofar as the loss of teeth is concerned. The human race has been subject from the earliest times to these two chronic conditions so destructive to dental tissues. Statistics show, however, that the incidence of dental caries has increased with modern civilization and its modified environment and dietary habits. It seems true also that so-called pyorrhea characterized by deeper degenerative and destructive changes in the alveolar process has increased in frequency.

For many years travelers, explorers and dental investigators have noted the absence of dental caries among the members of certain tribes in different parts of the world, from the tropics to the polar regions. The diets and habits were simple though extremely varied. Some peoples free from caries were very susceptible to severe gingivitis and the accumulation of salivary calculus.

The Eskimo race maintained immunity in the past on a carnivorous diet, wherein they did not, however, limit themselves to the muscle portions of the animal. The Hindu tribes maintained their immunity upon a vegetarian diet augmented by large quantities of milk. Other native tribes like those of the Island of Tristan da Cunha, reported by Dr. Marshall, used a mixed diet of eggs, birds, milk, fish, vegetables, with limited cereal foods. The preparation of foodstuffs varied as well as the constituents, some tribes using cooked foods, others uncooked, diets which in some cases provided for much function and cleansing action to the teeth, yet in others were soft and pappy. Practical immunity was maintained in all cases. Count-

less examples can be observed as to the deleterious effects of the inclusion of modern food in the native diet, which effects are given various interpretations by investigators.

Clinical studies of native and modern races and experimental animal research indicate that an adequate dietary must contain at least 35 or 36 chemical substances, including approximately 17 protein digestive products not synthesized by the body, ten common inorganic elements, plus traces of many more elements once considered food contaminations, and the vitamins A. B. C. D. E. and G. These chemical substances must be available in efficient forms and in good association balance, whether diet is being considered in relation to the whole human mechanism, or in relation to a part. The building of enamel and dentin of highest calcification grade with maintenance of healthy pulps free from degenerative changes requires this adequate supply throughout the formation period. Development appears to be normal in the prenatal period regardless of the food supply of the mother, but the periods of lactation, infancy and childhood require special care in order that proper building materials may be available. At all ages diet plus function are essential in the building and maintenance of healthy gingiva and other supporting tissues.

Numerous investigators, including Mellanby and Howe, have demonstrated the relation between calcification grade and caries. Poor calcification, marked by dentinal hypoplasia, facilitates the spread of caries regardless of its relation to the inception of caries.

The generally accepted theory of dental caries is the chemico-parasitic theory. This was advanced by Miller, and has been responsible for the slogan, "A clean tooth never decays." Under this theory it is believed that the fermentation of foodstuffs produces lactic acid, which in turn

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attacks the tooth structure. Another theory is that decay is due to alteration within the tooth structure during the life of the individual. This has been termed the vitalistic theory. The principal of the theory is that the tooth substance in itself is of prime importance in immunity or susceptibility to caries. It is believed that the character of the tooth is changed by variations in metabolism. A third theory is that change in salivary secretion or environment is the important factor. The buffer action of saliva, hydrogen ion concentration, and mineral content are held responsible for immunity or disease. The interpretations of dietary control of caries are similarly divided.

Bunting and his co-workers have been advocates of the chemico-parasitic theory. They have been attempting to control caries through the elimination of *B. acidophilus* from the mouth. A series of clinical tests have been reported, including use of anilin dyes, metaphen, hexylresorcinol, and lastly, minimum sugar and pastries to inhibit the organism. Although Bunting stated that "Diet influences dental caries most directly through its effect on the bacterial flora of the mouth," to date their reports indicate that the balanced and more adequate diets had more value in arresting decay than in the elimination of *B. acidophilus*.

Boyd and Drain maintain that a diet adequate for health will be adequate for the control of caries. They advocate a diet sufficient in energy and growth requirements stressing the value of milk, eggs, butter, meat, cod liver oil, vegetables and fruit daily. Case reports indicate that diabetic children and non-diabetic children fed on a good diabetic diet were practically immune to caries. They ascribed their results to the richness of mineral salts, and good balance of the diet, whereas Mellanby believes the results were due to the low cereal and high D content of the diet.

Research by Mellanby suggests the possibility that cereal intake might tend to influence the effect of Vitamin D in checking or inhibiting the spread of caries in children. Experiments on dogs indicate that cereals, especially oatmeal, tended to antagonize vitamin D in producing perfect calcification of teeth unless there was a superabundance of the vitamin. Experiments on orphanage children indicated that those on high cereal diets, especially oatmeal, had the greatest spread of caries. Tests made did not indicate that in order to prevent caries children must live on a cereal-free diet, but association of results of experiments on animals and children indicates that the amount of cereal eaten should be limited particularly dur-

ing infancy and early life, that its place should be taken by an increased consumption of milk, eggs, butter, potatoes and other vegetables, and that a sufficient supply of vitamin D should be given from birth and before birth by supplying a suitable diet to the mother.

Hanke has championed vitamin C as the most important factor in dental disease. Experimental studies have shown that radical alterations in tooth structure can be brought about in guinea pigs and monkeys by a deficiency of the anti-scorbutic vitamin. Hanke therefore stresses the value of large quantities of orange juice added to a well rounded diet to prevent dental caries. His report of the work as done at Mooseheart, Illinois, indicates that the work was not sufficiently controlled. Only 50 per cent of the children did not develop a cavity in the year during which large quantities of orange juice were given, 15 per cent developed more cavities than during the previous year, while 35 per cent developed one or two cavities. Such results hardly warrant the statement that the orange juice prevented decay. The children were of an age so that many susceptible areas were already protected by fillings; the period of a year was hardly long enough; though a well-balanced diet was offered the children, it is not known whether they ate a well-balanced diet. It is very possible for a child to leave certain foods untouched and eat greater quantities of others, and thereby obtain an unbalanced diet.

Hess states, "In connection with latent scurvy, the greatest importance must be attached to the assertion that dental caries is the outstanding sign of this type of disorder. As is well known, Hanke and others believe that the distinctive sign of a deficiency of the antiscorbutic vitamin is caries of the teeth; in fact, that this widespread dental disorder is due mainly to a lack of vitamin C in the dietary. Accordingly, they advise that the daily dietary should include a pint of orange juice and the juice of one lemon, as well as lettuce and cabbage. In my opinion, these deductions are far too sweeping and are not supported by the geographic distribution of dental caries or by a study of individual cases, which all indicate some other dominant etiologic factor."

Klein and McCollum in experimental work upon swine find that the feeding of a rickets-producing diet to sows during the second half of the gestation period of 115 days, although very injurious to the mother, does not affect the teeth of the progeny to any appreciable extent. When such diets are fed to sows during the suckling period, the milk is not of good quality and the

teeth and jaws are adversely affected as to structure, position and tendency to succumb to disease. When the rickets-producing diets are fed directly, pigs suffer still more marked effects in tooth structure.

Klein claims that an analysis of the diets fed by other workers show that those which produced caries were low in phosphorus, though adequate in other respects, including vitamins.

Some investigation has been made concerning the influence of the glands of internal secretion, such as parathyroids, on nutrition, particularly in relation to mineral metabolism.

Clinical and experimental evidence indicates that diet has a definite relation to disease and health of the investing tissues as well as of the tooth. Mellanby's work on dogs and vitamins A and D and others on C and B suggest the correlation between the two diseases. A dietary which includes cleansing foods seems to be of more advantage in this condition.

Study of the many reports of investigators gives emphasis to the value of a well-balanced diet in the control of dental caries. This diet must begin at birth and be continued with particular attention to good dietary principles at each age period. Cereal in most cases should be limited; plenty of phosphorus, calcium, and protein of good quality must be provided; sufficient

vitamins, without excessive amounts of any one, should be furnished. Use of the "protective" foods, milk, fruits and green vegetables, will lessen decay. Until scientific research points out one specific factor responsible for control of caries, it appears to be sound policy to employ a diet as complete in all respects as our present knowledge permits. It is possible that there will be data which will show that all controversial factors must be considered, not as independent factors, but in relationship to one another in their influence on oral health.

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## Practical Diabetic Diets\*

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**A** REVIEW of American diets, whether for disease or as epochs in the evolution of civilization, is an interesting study. This is especially true of carbohydrates. It has been estimated that in 1823 each person consumed about 8.8 pounds of sugar a year. At that time, because of its cost, it was used principally as a condiment. In 1930 the human consumption of sugar was 108 pounds per person. This difference is about 450 calories a day. Today sugar has become so important an item in our diet that nearly one-sixth of our energy comes from this source. We have even attempted to refine our carbohydrates to such an extent that many of the necessary elements have been removed. As you know, many diseases due to the lack of vitamins have been attributed to this cause. Polished rice

and milled cereals, such as white flour, breakfast foods, and corn starch are such articles.

Recently we have seen the scientist swing the pendulum back to roughage and unrefined products in order to hold these properties. Through advertisements there is no housewife who does not think vitamins and roughage are necessary in the household diet. These items have become a fad in our daily habits, whereas a few years ago we talked in terms of calories. We have forgotten that the pioneer American demanded meat dishes. Mendel has stated if you look over any menu of hotels in 1850 you will find two choices of meat soups, two of fish, twelve of meat (six boiled and six roasted dishes) with only ten vegetables and four desserts. But gradually during these eighty years we have desired more desserts, and, typical to the American slogan

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of the go-getting Yankees, we got what we wanted. It is peculiar how closely this has been attached to success, and the less the financial embarrassment in this country the more we have demanded sweets. Today no American meal is complete without either ice cream, pie, cake, or eclairs.

It is only necessary to travel in England and the continent to see the difference in the desires of those countries for the so-called necessities on the average American table. Protein is still their biggest article of diet. Housewives in our country, in an attempt to divide their diet, use three-fifths carbohydrate, one-fifth protein, and one-fifth fat, giving enough vitamins and roughage to care for our needs in other elements besides calories. Thus the American diet has changed from excessive protein to excessive carbohydrate over these periods of years. Since the war we have seen another wave of enthusiasm for the so-called obesity diets. This was necessary for the women to keep their bodies in dresses of fashion, and round curves were changed to angular ones. The American element of beauty demanded a slim body. Compare that idea with the standard of body beauty among the South Africans and the Eskimos. How strange the human eye is, especially the American eye!

Today through advertisements we are beginning to leave the low caloric diet, and vitamins have been pushed somewhat in the background. We are beginning to take a stand midway between the two extremes.

This same changing picture is just what has occurred in the treatment of diabetes in this same period. A few years ago we talked about high fat diets, thinking we had reached the height of success in the treatment of this disease. Within the last year certain medical scientists have advocated the other extreme, or high carbohydrate, low fat diet. A doctor is an individual trying to serve as does the housewife in reaching some sense of perfection. We cannot criticise him for his changing ideas when we consider how much we have changed the diet of the so-called healthy individual during this period. As a result all individuals of the last fifteen or twenty years, whether ill or well, have seen a marked change in food requirements. There is no field in which opportunity for dogmatism and quackery is so prevalent as in the domain of our daily diet.

Since 1914 we have seen the diabetic diet become more liberal in total calories. Then modified starvation in some form was used. The severe diabetic patient was still a pathetic individ-

ual. Our only attempt to keep him alive was with a low caloric diet which was supposed to lower his basal metabolic rate. In the end, acidosis was our greatest enemy. Early in 1920 Newburgh and Marsh came forward with some new ideas which brought to our attention the high fat, low carbohydrate diet. This diet allowed the patients to put on weight, and they have again become normal looking human beings. There were certain features of this regime which were questioned for quite a period of time. Through the careful work of Wilder on severe diabetic patients it was shown that many of Newburgh's ideas were correct. Wilder definitely determined that the protein intake in the diabetic was a factor that regulated the basal metabolic rate of the individual. In other words, by increasing or decreasing the amount of protein in the diet we could increase or decrease the metabolic rate of caloric consumption. He also found that under rest, and enough calories from carbohydrates and fats, two-thirds of a gram of protein was sufficient to maintain nitrogen balance. Most adult patients, exercising in the usual manner, require about one gram of protein.

Woodyatt had also determined previously that there was a certain amount of glucose necessary to combust the fatty acid radicals under severe acidosis. This ratio was about  $\frac{1-1.5}{1}$ , but by prolonged treatment, after the diet was established, we could use a higher ratio,  $\frac{2-2.5}{1}$  grams of glucose, and still not have acidosis occur. As a result the high fat diet gave the diabetic patient an opportunity to keep himself around a normal weight for his height and age. Today many diabetic individuals appear as robust and healthy as normal people.

About this time insulin was brought forward by Banting. This material again changed our method of dieting, and especially helped the severe diabetic patient who could not live with any material happiness on the high fat ratio that was present in the old diet. With insulin the longevity for these unfortunate individuals was increased to nearly a normal period of life. As a result over the last seven to eight years our diabetic patients have been accumulating in the world, and many have reached an age in life where death would normally occur. Cardiovascular complications are usually present in these individuals at the time of their death. Joslin has shown that before the introduction of insulin acidosis caused 85 per cent of the deaths of diabetics. Today it accounts for

only 10-20 per cent. Many deaths are said to be due to diabetes, when really it is only the contributing factor to the final cardiovascular accidents that occur in these individuals. Many times these individuals reach three score years and ten, and their death comes from natural causes not directly associated with diabetes. Since diabetes is one of the diagnoses given on the record, we have a rather confusing picture in mortality statistics.

After the introduction of insulin, we gradually increased the amount of calories these patients were allowed, usually allowing more carbohydrates, which in turn gave a low ratio between the glucose and fatty acid radicals. There have been levels arbitrarily established for these individuals. Joslin, for example, is in the habit of allowing usually between 100-125 grams of glucose in the diet, giving enough insulin to cover the necessary requirements. He has always been more careful to keep a lower fatty acid glucose ratio than have other diabetic clinics by not allowing the patient's diet to become greatly restricted in carbohydrates. He claims this has been a definite factor in keeping them on their necessary diet without periods of over-eating. During the last few years Sansum and Rabinowitch and their workers have gradually increased this amount of carbohydrates, and have allowed diets consisting of somewhere around 200-300, or even more, grams of carbohydrates daily. This has made it necessary for the patient to use a larger amount of insulin to cover this increased carbohydrate intake. Much to our surprise the amount of insulin required was not doubled as the amount of carbohydrates were correspondingly increased. Sometimes on a markedly higher carbohydrate diet the insulin has only been increased 30-40 units. This is one factor which has given the physician the impetus to use higher carbohydrates than necessary to maintain caloric and nitrogen balance. In the end it returns to the regime that is now present among the American people of using a high carbohydrate diet. There are certain features of this diet which I shall discuss later in this paper.

Therefore, reviewing the diets that have been used during this period, we see that a high fat, low carbohydrate diet is one extreme; another extreme is a high carbohydrate, low fat diet which is very much in vogue in certain diabetic centers at the present time. This leaves someone to advise a high protein diet as the best regime, and this had been done by Porges of Vienna. There are certain features in a high protein diet which are not as desirable in the United States as in

Europe. It is more the diet of the pioneer American fifty to seventy-five years ago and of the European countries at the present time. For that reason it probably is the desired diet for certain types, groups, or races, but in this country it is not particularly desirable. Most American people are preferring to live on a low protein intake. This they have done of their own accord, as discussed in the early part of this paper. The average American desires a high carbohydrate intake. If a larger amount of protein is used, we are going to have an increase in the metabolic rate of the individual, which demands more calories and a larger amount of insulin. If these factors are kept in mind it is probably of no greater harm to the individual than our high carbohydrate diets mentioned above.

This gives somewhat a review of diabetic diets over the same period that we have seen changes in the diet of the healthy individual. It is surprising how closely the two coincide. Of course the diabetic is becoming a normal individual with the use of insulin, and naturally he is going to follow in the footsteps of his healthy associates. As a result we have become neglectful of two facts in the treatment of these individuals. First, there is a waste of calories to satisfy a desire, or at least a lack of stamina to the principle and treatment we know are best for this group of patients. Second, there is the financial loss due to the large amount of insulin used. In this period of depression it is an important factor in budgeting the poor man's income. Patients in the dispensary of the University Hospital are complaining of this condition. During the last year the high carbohydrate diets were used in the hospital. These patients were many times allowed to return to their homes on a diet between 200-300 grams of carbohydrates, and necessarily larger amounts of insulin. Within a few weeks they were seen in the dispensary. Their cry was the enormous amount of money that had to be expended to keep them on their diet.

If patients are going to use indiscriminate amounts of insulin there are other dangers that have to be considered. The larger the amount of insulin taken, the more shock to the system if it is suddenly discontinued. Very often we see this done with disastrous results in reliable institutions where a patient's insulin is suddenly cut from a high amount to a very few units per day. This is especially true if the patient is running a temperature, seriously ill, or taking little or no food. When the patient has an acute respiratory infection, whether a cold or pneumonia, the insulin is

more important than the amount of food ingested. We have all seen reliable physicians discontinue insulin during periods of serious illness or injury. This has increased the acidosis to such a great extent that the patient's death was not due to the severe condition that brought him to the hospital. Patients on a lower diet and less insulin are less apt to develop this condition.

After adjusting their diets to a lower carbohydrate intake some of these individuals have become sugar-free without insulin but still are allowed 125 grams of carbohydrate intake daily. Many of these individuals have had to apply to county and public relief for financial help. It seems to me this money could be used to a better advantage if it were spent for more desirable food rather than for insulin. Individuals in the upper stratum of life also have complained of the expense, and have found they are getting more carbohydrates than they desire. They feel stuffed and uncomfortable; they are making more or less the same complaint that a patient did a few years ago on a high fat diet. Regardless of whatever injury this diet might give the individual, I feel it is not practical both from the financial and the economic standpoint. Of course I do not mean these individuals should be allowed to lose weight by restriction of total calories, but a relatively higher amount of fat could safely be used in their diets with a restriction in the carbohydrate intake and a smaller amount of insulin.

Many elderly diabetic patients are apt to ask that we do not give them insulin if we can maintain them on a satisfactory diet without it. There are certain factors in the treatment of elderly individuals which make it desirable that we do not keep them too low in glycosuria, or blood sugar. It has been stated by Joslin that years ago in his over-zealous enthusiasm he felt he had brought about a sudden death of an elderly diabetic. The patient was put on a markedly restricted diet, became sugar-free suddenly, probably resulting in a low blood sugar or hypoglycemia, and died in a cardiac attack, probably angina.

I feel it is very essential that each elderly diabetic patient should have a thorough examination of his heart by electrocardiogram to determine if he is not a potential case of angina, which might occur during treatment. The old idea that severe starvation was not good for an elderly diabetic holds just as true today as it did formerly, but many of these individuals have had attacks of angina while under a relatively high diet with larger amounts of insulin, which has brought

about the same condition that we feared under the old regime. I therefore feel many elderly diabetics are better if allowed to have a small amount of glycosuria constantly. It has been shown recently by Strouse that many of these individuals develop their anginal attacks during periods of relative, or true, hypoglycemia. We realize a diabetic individual over the age of forty usually shows an arteriosclerosis of his vessels, which can be demonstrated by x-ray of the vessels of the feet, or by electrocardiographic investigation.

Most elderly patients do not care for as much food as younger individuals. They are usually willing to stay on a diet as outlined under Diabetic Diet No. 1. You will note that this allows a little bread, oatmeal, or potato each day even though it is restricted in carbohydrate intake. This diet is usually very acceptable to the obese individual. At times, of course, we may even restrict the fats to 100 grams.

Two other diets as outlined in the charts are also used. I feel most individuals are happy on a diet somewhere between 100-140 grams of carbohydrate. If one can use these diets without the introduction of insulin, the patient has a great deal milder case. Most patients on as high a diet as outlined in Diabetic Diets No. 2 and No. 3 usually need some insulin. It has been our experience in the University Diabetic Dispensary that it is unusual for them to need more than 25-40 units a day unless they are very severe cases. The caloric requirements in all three diets can be increased or decreased in amount, depending upon the necessary caloric intake for the individual.

The necessary intake, or basal diet, depends upon the individual's height, weight, and age. The amount of calories can be determined from Sandiford's and Boothby's old graphic chart or can be figured from Dubois' scale, which is found in any reliable book on metabolism. As a rule, the individual should be allowed about 50 per cent more than his basal requirement, which generally is in the neighborhood of 1800-2400 calories a day. All three of these diets can be easily changed to give any possible change in calories. This is usually done by increasing or decreasing the fat in the diet.

There are a few individuals, for example traveling men, who eat in hotels and restaurants and find it almost impossible to stay on a restricted diet. Under these circumstances their carbohydrate intake is around 175-190 grams. This is about all that any individual can ingest unless food is taken in a very concentrated form. If they are willing to stay on a diet of 175 grams, it

is easy for them to pick out such a diet from any hotel menu. Any diabetic individual who is interested in his diet at all will be able to omit weighed in any diet in a very short time. By observing how much makes a tablespoonful and a cupful, he soon has a very good idea of what the weight of his food should be. I do feel that each diabetic, in beginning his first course of lessons, should be made to weigh his food in order to learn what the weight of an average helping should be. I believe it is unusual for any patient in the University Diabetic Dispensary or in my private practice to be weighing his food within two months after his diet is established.

You will notice the portions allowed in these diets are listed under two headings, Amount and Grams. This makes it fairly easy for the patient to follow his diet within ten to fifteen grams of his intake each day. If he is using insulin the variation of his diet up and down from day to day is not of sufficient importance for him to weigh his food. This does not mean that his urine should not be tested daily. If it is found that he is showing an increasing amount of sugar, he should be more careful for a few days in order to clear up a moderate amount of the glycosuria. It is a very unusual individual who needs a diet of 175 grams of carbohydrates. This is not a marked restriction. During the last year it was found in a number of hospitals that the average diet of the internes and nurses in most institutions is somewhere between 125-140 grams of carbohydrates, 65-90 grams of protein, and about 100-200 grams of fat. If these healthy individuals can live on this diet, there is no reason why a diabetic individual, living on this diet and eating because of his disease, would not accept a low carbohydrate intake. I feel it is the rare individual who should be given a higher intake of carbohydrates, which in turn usually means a larger expenditure for insulin.

My only plea in offering this paper is to bring to your attention the laxity of the patient toward his diet, and the loss of consciousness of the physician to his patient that has developed in the last one to two years in the treatment of this disease. I feel that the physician has a definite responsibility to the patient today as well as in times past. He should teach the individual as much as possible about food values, how to figure diets, and how to test urine. He should not discharge the patient from his mind after giving him a syringe and a bottle of insulin. This may be carrying the picture a little bit too far, but I have seen cases in which this procedure has more or

less been followed. I personally am not in favor of the relatively high carbohydrate diet which is used in some institutions with a larger amount of insulin. I feel in looking over the history of diets for individuals in health and in disease that the pendulum will probably gradually swing back half way between the relatively high fat diet of yesterday and the relatively high carbohydrate diet of today, and in the end our patients will be receiving diets somewhere between 100-150 grams of carbohydrates each day.

## DIABETIC DIET NO. 1

C. 65 gms.; P. 65 gms.; F. 150-200 gms.; Cal. 1870-2320		
Breakfast:	Amt.	Gms.
10% Fruit	1 Serving	100
Bacon, Cooked	4 Strips (3¼")	15
Egg	1	50
Cream, 20%	½ Cup	113
Dinner:		
5% Vegetable	1 Serving	100
10% Vegetables	1 Medium Serving	84
Meat (Lean)	1 Serving	100
10% Fruit	1 Serving	100
Mayonnaise	2 Tbsp.	50
Butter	2½ Squares	25
Cream, 20%	½ Cup	113
Supper:		
5% Vegetable	1 Serving	100
10% Vegetable	1 Medium Serving	84
Eggs	2	100
10% Fruit	1 Serving	100
Mayonnaise	2 Tbsp.	50
Butter	2½ Squares	25
Cream, 20%	½ Cup	113
To the above add ONLY ONE of the following:		
Bread	1 Slice (¼" Thick)	20
or Oatmeal, Cooked	¾ Cup	90
or Potato	½ (2½" Diam.)	50

## DIABETIC DIET NO. 2

C. 100 gms.; P. 65 gms.; F. 200 gms.; Cal. 2460		
Breakfast:	Amt.	Gms.
10% Fruit	1 Serving	100
Bacon, Cooked	4 Strips	15
Oatmeal, Cooked	½ Cup, Scant	100
Toast	½ Slice (¼" Thick)	10
Cream, 20%	1 Cup	226
Butter	½ Square	5
Dinner:		
5% Vegetable	1 Serving	100
Potato	1 (2½" Diam.)	100
Meat (Lean)	1 Serving	100
Butter	2 Squares	20
Cream, 20%	¼ Cup	56.5
Mayonnaise	2 Tbsp.	25
10% Fruit	1 Serving	100
Supper:		
5% Vegetable	1 Serving	100
10% Vegetable	1 Large Serving	150
Eggs	2 Medium	100
Mayonnaise	2 Tbsp.	25
Bread	1 Slice (¼" Thick)	20
Cream, 20%	¼ Cup	56.5
10% Fruit	1 Serving	100
Butter	2½ Squares	25
Cereal Substitutions		
Oatmeal, Cooked	½ Cup, Scant	100
Farina, Cooked	½ Cup	100
Cornflakes	½ Cup	14.2
Shredded Wheat	½ Biscuit	14
Bacon Substitutions		
(Omit) Bacon, Cooked	4 Strips, 3¼"	15
(And add) Egg and	½ Medium	25
Butter	½ Square	5
Egg Substitutions (Supper)		
(Omit) Egg and	1 Medium	50
Butter	½ Square	5
(And add) American Cheese	1 Cube	25

DIABETIC DIET NO. 3

C. 140 gms.; P. 65 gms.; F. 200 gms.; Cal. 2620		
	Ant.	Gms.
<b>Breakfast:</b>		
10% Fruit	1 Serving	100
Toast	1 Slice (3/4" Thick)	20
Butter	1 Square	10
Oatmeal, Cooked	1/2 Cup, Scant	100
Cream, 20%	1 Cup	226
Bacon	4 Strips (3/4")	15
<b>Dinner:</b>		
5% Vegetable	1 Serving	100
Potato	1 (2 1/2" Diam.)	100
Meat (Lean)	1 Serving	100
Bread	1 Slice (3/4" Thick)	20
Butter	2 Squares	20
Mayonnaise	2 Tbsp.	25
15% Fruit	1 Serving	100
Cream 20%	1/4 Cup	56.5
<b>Supper:</b>		
5% Vegetable	1 Serving	100
Either { 15% Vegetable or	1 Serving	100
{ 10% Vegetable	2 Servings	200
Bread	2 Slices	40
Butter	2 Squares	20
Mayonnaise	2 Tbsp.	25
Eggs	2	100
Cream	1/4 Cup	56.5
15% Fruit	1 Serving	100
<b>Cereal Substitutions</b>		
Oatmeal, Cooked	1/2 Cup, Scant	100
Farina, Cooked	1/2 Cup	100
Cornflakes	1/2 Cup	14.2
Shredded Wheat	1/2 Biscuit	14
<b>Bacon Substitutions</b>		
(Omit) Bacon, Cooked	4 Strips, 3/4"	15
(And add) Egg and	1/2 Medium	25
Butter	1/2 Square	5
<b>Egg Substitutions (Supper)</b>		
(Omit) Egg and	1 Medium	50
Butter	1/2 Square	5
(And add) American Cheese	1 Cube	25

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## The Treatment of Chronic Constipation\*

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THE term constipation is a general one usually referring to a condition of infrequent, difficult bowel movements. The stools of individuals complaining of constipation are usually hard, small and ball like. Occasionally those who have one normal stool every two or three days and no distress, erroneously term themselves as being constipated and use unwarranted measures to bring about more frequent defecation.

The problem of constipation is important and widespread. In a series of 600 consecutive patients seen at the out-patient department of the University of Minnesota Hospital over 20 per cent stated that they were constantly constipated and over 20 per cent more stated that they were constipated at times. The management of this condition has usually been out of the hands of physicians and has often led to abuses in methods of treatment. On the other hand physicians themselves have frequently

paid scant attention to this important problem and patients sometimes date their difficulty at stool and the establishment of a cathartic habit from a hospital stay.

Two primary factors determining the frequency and character of stools are the amount and type of food ingested and the structure and function of the large bowel. Some of the secondary factors influencing the stools are physical activity, regularity in stool habit, and nervous influences. Clinically it seems evident that there are great differences in the function of the colon in individual cases even though the amount and character of the food ingested be the same in all instances. Treatment for that reason demands a certain degree of individualization although there are general principles applicable to most people.

Constipation is but a symptom or a group of symptoms and in most cases is due to functional causes. It is advisable, however, that a thorough history be taken and a physical ex-

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amination made before assuming it to be of such a nature. Conditions of the rectum such as fissure, hemorrhoids or carcinoma may make bowel evacuation difficult and should be ruled out in every case. Carcinoma of the colon must be ruled out in any case of constipation of increasing severity, especially if there be weight loss. Carcinoma in this location is often insidious in onset and overlooked for some time. Diseases elsewhere in the gastrointestinal tract or anywhere in the body may have some influence on the function of the colon.

The consideration in this paper is of those patients with functional constipation. From an analysis of 600 cases it has been of interest that catharsis has been the almost universal method employed in treating constipation. Over fifty per cent of the 600 consecutive individuals entering the admission clinic for all types of complaints state that they use cathartics, and many of them use them more than once a week. Enemas are used by a much smaller group. A very few state that they regulate their stools with diet alone. The question arises as to the advisability of treating constipation by catharsis and large enemas. Clinically there seems little doubt but that the establishment of the habitual use of cathartics and large enemas often leads to the more and more frequent need for use to obtain bowel movements. Experimentally it has been shown that this use often leads to a decrease in the functional ability of the colon. Such methods are definite irritants and in the experience of many clinicians have often led to more serious functional disturbances of the large bowel. In the authors opinion catharsis and large enemas have little or no place in the treatment of constipation.

The dietary regulation of the stool is of great importance. Much study has been made of the assimilation of different food substances in the gastro-intestinal tract. Such studies have shown that digestion largely takes place before reaching the large bowel. Foods in general may be placed in two classes in regard to their passage into the colon. These may be termed as concentrated and bulk foods. The bulk foods consist largely of the fruits, vegetables, and bran, all of which contain cellulose. The amounts of these bulk foods ingested largely regulate the size, consistency and frequency of the stools. Certain individuals who ingest very little bulk food tend to have loose stools and abdominal cramps while on the

other hand a few may take a large quantity of such foods and yet have infrequent small stools. The majority of persons, however, lie well within such extremes. The foods which seem most advisable to use in the regulation of the bulk intake are the cooked fruits and cooked green vegetables. The raw fruits and raw vegetables seem to be somewhat more irritating than the cooked and also often give the patient a false notion of the amount of bulk ingested. An example of this is the apparent large amount of bulk in a bag of fresh spinach which cooks down to a much reduced volume.

Patients are advised to adjust the amount of cooked fruits and vegetables to the production of normal formed stools. Many patients are dissatisfied unless a daily stool is present, however they are advised that it is satisfactory if they have but one stool every two or three days if it be of normal consistency and without attendant distress. Bran is not advised in any case because of the apparent irritating quality of this food and the tendency towards occasionally forming an impaction.

It is important to urge regularity in stool habit. When practicable exercises or an increase in physical activities are often of some value. With individuals who have been constipated a number of years it is often advisable to assist them in having stools until regular normal stools are again established. Small oil retention enemas and if necessary small water enemas are given to accomplish this. Each patient is given printed instructions. Certain variations are made in some cases. A copy of these general instructions are as follows:

#### INSTRUCTIONS FOR CONSTIPATION

Chronic constipation is in most cases entirely unnecessary.

The seat of constipation is the large bowel, which represents about the last five feet of the intestinal tract. Many symptoms may develop as a result of improper functioning of this tract. The abuse of cathartics, enemas, and irritating foods are often responsible for aggravating trouble there.

#### STOOLS

Most individuals should have one or two normal stools per day, although a formed stool without symptoms once every two or three days is normal for some people. A normal stool is about the size and consistency of a small peeled banana. Constipated stools are usually hard and dry and may be ball-like or pencil-like in shape. An effort should be made

to have a bowel movement at a regular time each day.

#### CATHARTICS AND ENEMAS

No medicine of any kind is to be taken for bowel movements.

No large enemas are to be used. (1-2 quarts).

#### DIETS IN CONSTIPATION

The use of the proper fruits and vegetables in sufficient amount is the most important factor in treating constipation.

Fruit is to be taken three times daily, cooked fruits are usually preferable to fresh fruits. Some of the best are: prunes, apricots, baked apple, apple sauce, rhubarb, pear and peach sauce.

Vegetables—GREEN COOKED VEGETABLES are to be taken in liberal amounts for both the noon and night meal. Their chief value is that they contain bulk food which will pass into the large bowel and furnish material for bowel movements. Some of the best green cooked vegetables are: spinach, string beans, beets, carrots, greens, squash, peas, asparagus and cauliflower. Cabbage is often undesirable and should not be used in most instances. The fruits and vegetables are the foods which largely regulate the bowel movements and should be taken in the required amounts. This will vary for different individuals. The amount of fruit must not be in excess with too few vegetables. The test of sufficient bulk is whether or not the individual is having daily normal stools. If too much bulk the stools will be loose which calls for a cut in the amount of fruit being taken.

#### FOODS TO AVOID

Bran is an objectionable food as it is too coarse for most human beings. It is usually advisable to avoid ice cold drinks.

Other foods may be taken much as desired, the important factor being a sufficient amount of bulk food in the form of cooked fruits and cooked vegetables.

Early in the treatment of constipation there may be difficulty having normal stools. If no bowel movement has been had for two days it is advisable to inject two or three ounces of olive oil or salad oil into the rectum at bedtime and leave in overnight. If no bowel movement has been had by the next morning a 1 pint clear water enema may be used.

The above instructions are applicable to the majority of constipated patients seen at the University Out-patient Department. There are certain nervous individuals often with cramps and with occasional spells of diarrhea, for whom such instructions might prove unsatisfactory. Some of these do better on low bulk diets or with the gradual addition of cooked vegetables and fruits later as tolerated. In such cases rest and the elimination of nervous stimuli are often of as much or more importance than diet. While such nervous patients with constipation make up only a small percentage of those seen here they would undoubtedly form a higher percentage of the cases seen by a consultant in gastro-intestinal diseases.

The simple addition of adequate fruits and vegetables to the diet is a practical and satisfactory method of dealing with most of the cases of constipation seen at the out-patient department of the University Hospital.

## Diet in the Treatment of Various Forms of Anemia\*

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IT IS difficult to divorce the dietary treatment of the various forms of anemia from the treatment with extracts of food substances, such as liver, stomach and kidney. It is equally difficult to consider the subject without reference to various inorganic substances, such as iron, copper and manganese. In the short space allotted my subject only fundamental consideration can be given to the various forms of anemia.

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It has long been thought that meat, particularly red muscle meat, blood, yolk of eggs, and various greens, particularly spinach, had a well marked effect in the production of hemoglobin and erythrocytes. It is well known that a diet, the main constituents of which consist of carbohydrates, is frequently productive of considerable anemia. The typical tea and toast diet of many women is notoriously productive of anemia. Many diets are deficient in substances necessary for proper regen-

eration of blood; such deficiency may result from improper or insufficient food, from incomplete digestion of food or from its defective absorption.

#### EXPERIMENTAL

In the last twelve years important experimental work has been carried out on the production and treatment of anemia. The classic experiments of Whipple and Robscheit-Robbins and their associates have added tremendously to knowledge of the effect of various substances in the production of hemoglobin. The most outstanding demonstration has been the effect of the ingestion of mammalian liver on the production of hemoglobin, about four times as great as that of the ingestion of red muscle meat, and that certain fruits, particularly peaches, apricots, prunes and apples are rich in the substances which cause the formation of hemoglobin. It was demonstrated that spinach and egg yolk, which have been so greatly favored in the dietetic treatment of anemia, have little effect in regeneration of hemoglobin of dogs made anemic by chronic hemorrhage. Almost equally effective with liver were the kidneys of mammals and the gizzards of fowls. Some of the outstanding results of the work of these authors are incorporated in the tabulation.

Waddell, Steenbock and Hart, working with rats made anemic by a diet exclusively of milk, have found that pure iron will neither prevent nor relieve the anemia produced by the milk, but that the addition of a small amount of copper prevents and cures the same anemia. This work has been corroborated by Ortner and his associates but has been disputed by several other workers, notably Beard and Myers.

Barlow found that in the cure of anemia of pigeons produced by fasting, the following were effective in the order named: Whole grain, beef muscle, 75 per cent beef muscle and 25 per cent liver, 25 per cent beef muscle and 75 per cent liver, and liver.

Whipple and Wolf found that oysters, particularly fresh oysters, would prevent and cure anemia of rats developed by the use of a diet exclusively of milk, and Levine, Remington and Culp found that oysters were rich in iron, copper and manganese, and also a good source of vitamins A, B, C and D and of iodine.

Farmer and his co-workers found essentially the same values for liver, apricots and spinach for anemic albino rats that Whipple found for dogs.

#### TREATMENT OF ANEMIA OF HUMAN BEINGS

The use of a diet containing considerable red meat, yolk of eggs and greens, especially spinach,

has been advocated for many years, largely because it was thought that organic iron was more effective in the treatment of anemia than inorganic iron, and these foods were comparatively rich in this material. Dietary defect has been especially obvious in certain types of secondary anemia among the poor, who use meat and green vegetables sparingly. Sprue and pellagra are two diseases in which dietary deficiency is definitely concerned, and which respond to treatment by diet.

*Pernicious Anemia*—Minot and Murphy have applied the experimental work of Whipple and his associates to the treatment of pernicious anemia of human beings. In 1926 they published the results of the treatment in such cases by a diet the main constituent of which was liver, but which also contained a considerable proportion of fruits and green vegetables and little fat. It was found that the symptoms and the condition of the blood improved rapidly. The reticulocytes, which are now recognized as the best criterion of regeneration of blood, rose rather rapidly to a peak from which they more or less rapidly declined. There was a rapid increase in erythrocytes and hemoglobin, and a considerable increase in leukocytes. Although the diet contained a comparatively small amount of fat, more recent work indicates that fat content is not of great significance. The liver is the most important article in the diet, and the green vegetables and fruits furnish accessory factors. The full diet list may be found in their original publication.

Although cooked liver is permissible, the same amount of raw liver seems to have a more beneficial effect. The liver can be ground and suspended in any fruit juice and taken with little difficulty. If the liver is cooked, one should be careful to save the juice, as the effective material is water soluble. In the use of liver, it must be emphasized that in some cases large amounts are required. Beebe and Lewis have emphasized the necessity not of some liver, but of enough liver; whatever is needed to keep the patient in good condition must be given.

Since Whipple, Robscheit-Robbins and their associates had found that kidney was almost as effective as liver in the regeneration of hemoglobin, McCann and Minot and Murphy demonstrated its almost equal value in pernicious anemia.

Almost simultaneous with the development of the diet of liver was the development of a diet rich in vitamins for pernicious anemia. Koessler and Maurer, in 1927, reported the use of a diet

selected for its rich content of vitamins in the treatment of pernicious anemia. They based its use on their experimental work, in which they produced by the administration of a diet deficient in vitamin A, anemia in rats closely resembling pernicious anemia. Their diet contained a considerable amount of liver which was used because of its rich content of vitamins. The results were eminently satisfactory.

Before the publication of Koessler and Maurer's work, I had been experimenting along similar lines and had formulated a diet rich in vitamins. I had used cod liver oil alone in nine cases without effect. My diet was similar to that of Koessler and Maurer's except that it contained only a small amount of liver, usually two ounces daily.

A specimen diet is given: 1. Butter, about 90 gm.; cream, 240 gm.; raw milk, 1.5 pints. 2. Two or three eggs. 3. From 60 to 120 gm. of muscle meat or fish; liver, sweetbreads, kidney or brains, 50 to 60 gm. daily, or 100 to 120 gm. every other day. 4. Whole wheat bread, 90 gm.; whole wheat muffins. 5. Three oranges or two oranges and half a grapefruit; one or two servings of other fruits as desired. 6. Sweet or white potato; at least 90 gm. of tomato, preferably raw; 90 gm. of raw cabbage; at least 60 gm. of lettuce; other vegetables such as spinach, dandelions, peas, carrots, onions and squash as desired. 7. Cod liver oil, 45 gm. daily. 8. Dried brewer's yeast (Harris), 12 gm. daily. Modifications are made to suit individual needs. In some instances more liver was required.

Very satisfactory results were obtained with this diet in a large series of cases, and the effect on the blood seemed probably not to be due entirely to the liver. It seemed, too, that the effect on the neurologic condition was more satisfactory than that obtained by the use of the liver or liver extract.

It has long been thought that pernicious anemia might, in some way, be associated with defective function of the stomach or some portion of the gastro-intestinal tract. This has been indicated by the almost consistent absence in the stomach of free hydrochloric acid in pernicious anemia and by the frequent and varied gastro-intestinal symptoms. This opinion, however, was based mostly on clinical evidence until Castle and Locke demonstrated that muscle meat eaten by a normal person, recovered in vomitus, and again fed to a patient having pernicious anemia brought about a remission similar to that produced by the use of liver or liver extract. I found that 25.9 per cent

of a large series of blood relatives who had pernicious anemia lacked free hydrochloric acid in the gastric contents, and this observation definitely pointed to some essential, probably often familial abnormality of the stomach in association with pernicious anemia. Castle assumed that the stomach secretes a substance (intrinsic factor) which acts on protein (extrinsic factor) in the stomach to form a material which causes maturation of erythrocytes and whose lack results in the development of pernicious anemia.

Basing their work on Castle and Locke's data, Sturgis and Isaacs reported the satisfactory treatment of pernicious anemia by means of the administration of desiccated, defatted gastric tissue of swine. The effect in all respects was similar to that obtained by the use of liver and liver extract. Independently, also following Castle and Locke's work, I used raw and desiccated gastric tissue of swine with similar results. I found that the results could be obtained with the whole gastric wall, with the mucous membrane alone, with muscularis alone, or with the fundus or pylorus alone. Whether the effect of each of these was equal, I did not determine. I was able also to produce the effect without the addition of other meat to the diet. I reported the results in sixty cases in which this material was given; most of the patients were given raw gastric tissue. The results apparently were in every way similar and apparently equal to those obtained by the use of liver or liver extract.

Wilkinson also independently reported on the use of both raw and dried stomach and obtained similar results. He felt, however, that the effect of gastric tissue was more marked than that of liver or its extract. Gastric tissue of cattle has been used with satisfactory results by Clerici and by Crosetti.

Because of the fact that the neurologic symptoms under any form of treatment yet advised had been more or less resistant to treatment, Ungley was led to try the effect of brain tissue in cases of pernicious anemia. He found that, weight for weight, brain was about one-third as effective as liver in producing increase of erythrocytes and hemoglobin, and was equal or better than liver in its effect on the neurologic condition.

With all three methods of treatment of pernicious anemia, that is, by liver, stomach and food rich in vitamins, failures sometimes occur. These usually can be ascribed to infection, to insufficient dosage, or to an ineffective preparation. It is well established that an acute infection occurring

in the course of pernicious anemia often results in considerable delay in recovery from the anemia, which is evidenced in the blood by the decrease in percentage of reticulocytes. In the presence of severe infection it is desirable to increase the dosage of the effective material from 50 to 100 per cent. It is also necessary to give larger doses to older patients, probably because of arteriosclerosis. It is known that transfusion of blood may diminish the effect of any of the effective substances.

Improvement in the neurologic condition, by all methods of dietetic treatment, has been rather irregular. When the main symptoms consisted of numbness and tingling in the hands and feet, they frequently subsided or became markedly ameliorated. When, however, there was definite evidence of severe combined degeneration of the spinal cord, as evidenced by spastic gait and the presence of extensor plantar reflexes, great improvement seldom occurred. However, Baker, Bordley and Longcope have shown that very large doses of the effective material may bring about improvement not obtainable with the ordinary dosage given to the patients whose difficulty is principally manifested in the blood. They give as much as 750 gm. of liver, or its equivalent in liver extract, a day. They emphasize that time is a considerable element in any improvement. They even observed improvement in approximately 59 per cent of the signs and symptoms in eight cases of advanced subacute combined degeneration, in which treatment had been carried out for more than ten months.

The maintenance dose of liver varies from 150 to 500 gm. or more each day and it is seldom wise to give less than 200 gm. The maintenance dose of raw stomach is from 120 to 480 gm. or more, depending on the intensity of the neurologic changes.

It should be emphasized that these patients are not cured by any of these effective materials and that continuous treatment is absolutely necessary. It is true that remissions may occur for a year or more without any treatment, but if the patient is permitted to go without some one of the effective materials he is taking a great risk of development of neurologic changes, from which recovery is much more difficult. Enough of the effective material should be administered to keep the erythrocytes at normal, that is, about 5,000,000, and to keep the neurologic changes from progressing, and if possible to bring about their improvement. Difficulty may occur with any dietary treatment, if patients are very ill. In such case, one of the

liver extracts may be given by gastric or rectal tube, or by intramuscular or intravenous injection.

In the feeding of stomach slight difficulty may be experienced at first because of the prejudice against the use of raw meat of swine. However, such prejudice usually is readily overruled, and the patient takes the material. Stomach usually is without taste or smell and is fairly palatable if mixed with the juice of tomato, orange, cranberry, or that of other fruits, or with milk. Of course, it must be ground as fine as possible. Liver may be administered either cooked or raw, and if cooked may be used in various combinations with other foods to avoid tiring of it. If liver is given raw, it is finely ground and suspended in one of the fruit juices. Raw stomach is probably the least expensive of all the materials.

In the practical treatment of pernicious anemia by diet, chief among various difficulties is the reluctance on the part of the patient to continue the diet as soon as he is relieved of distressing symptoms. This tendency may often be fostered by the physician who feels that the patient has had enough treatment and can safely discontinue it. But it has been proved that to discontinue treatment may result in dire consequences, particularly by the development of neurologic changes or their progression if already present. Since the institution of treatment of pernicious anemia by diet the death rate from this disease has fallen most remarkably, and it is now the exception, rather than the rule, for a patient to succumb to the disease. If death does occur, it is usually due to intercurrent disease, or to extreme neurologic involvement.

Liver extract, ventriculin and extract of codfish livers by mouth, or liver extract, or extract of stomach given intramuscularly or intravenously are not considered here.

*Secondary Anemia*—In contrast with the very effective treatment of pernicious anemia by diet, is the rather ill-defined and often ineffective results of such treatment of various forms of secondary anemia. In spite of the fact that Whipple and his associates demonstrated that liver, kidney, fowl gizzard, peaches, apricots, prunes and apples have marked ability to cause regeneration of hemoglobin in dogs, little use has been made of these observations in the treatment of secondary anemia, save in the rather common administration of liver without any very definite idea of its effect. Little if any use has been made of these materials other than liver in a carefully observed series of cases of secondary anemia. It is likely,

however, that one or more of the other materials could be added to the diet with advantage. In most of the carefully observed cases liver has been used. I have obtained good results with a diet rich in vitamins, usually with iron, in a variety of cases of secondary anemia. Giffin and Watkins reported good results with desiccated fetal liver in various forms of secondary anemia, and recommend a diet rich in vitamins, including adult liver, fetal liver, kidney, red meats, apricots, peaches and prunes together with large amounts of iron in chronic idiopathic hemoglobin deficiency anemia, chronic hemorrhagic anemia, and chronic infectious types of anemia.

In secondary anemia due to chronic loss of blood, Murphy and Powers, Wahlberg and Dyke obtained good results with liver, as have other observers. The result, however, seems to be almost equally good with iron as with liver, but on the whole probably better when both are administered. Keefer and Yang and Cabot have also advised the use of liver and iron in chronic hemorrhagic anemia. Liver extract of the type effective in pernicious anemia has universally been found to be almost ineffective.

Of the hemolytic types of secondary anemia, that due to hemolytic icterus seems not to respond to any dietary treatment, but only to splenectomy. Jedlicka and Varadi used liver in the treatment of three cases of hemolytic icterus without beneficial result. I have seen no mention of treatment by diet for Lederer's acute hemolytic anemia which seems to be of rather rare occurrence.

Among the nutritional types of secondary anemia, that of infants has been found by Hill and by others to respond to the administration of liver or iron or both. For this anemia it is also desirable to prescribe a well balanced diet. The anemia of premature infants has been found by Abt and Nagel and by Greengard to respond most favorably to iron, and a liver fraction different from that used in pernicious anemia. The anemia of infants produced by the administration of goat's milk is cured by the use of cow's milk.

The nutritional anemia, due to dysentery, has been found by Keefer and Yang to respond to liver and iron. The anemia associated with sprue, which so closely resembles that of pernicious anemia, is benefited in all particulars by the treatment administered in pernicious anemia. It seems desirable also in many instances to restrict the carbohydrates and fats. The anemia associated with pellagra usually responds to the administration of a diet rich in vitamins which contains some liver. That which accompanies scurvy is not bene-

fitted by the use of iron or liver but only by the administration of vitamin C in some form.

The anemia associated with malnutrition which occurs as a result of carcinoma especially of the gastro-intestinal tract, and particularly that of the stomach, usually persists in spite of dietetic or medicinal treatment, although liver, blood-building foods, and iron may be of value. If anemia is due simply to faulty diet, especially a diet containing too much carbohydrates or dairy products, correction of the diet will usually suffice, but the use of iron, liver and other blood-building foods may help. Kaufman found that the anemia of tuberculous children responds to the use of liver and that their general condition also is improved. He recommended that liver be included in the diet of all tuberculous patients.

Anemia which sometimes accompanies Bright's disease has been thought by Whipple possibly to be due to the absence of some internal secretion of the kidney, and he suggested the feeding of kidney as a therapeutic measure. I have seen no report of results of its use in such cases.

No specific treatment has been found for the anemia accompanying myxedema, hyperthyroidism, or Addison's disease, other than the use of the specific substance bringing about improvement in the basic disease. Liver and other blood-building foods, or iron, or all, may be tried.

It is notorious that anemia accompanying infectious diseases is resistant to treatment, particularly anemia accompanying bacterial endocarditis, septicemia, and acute infectious diseases. Liver and other blood-building foods and iron may or may not be of value in the anemia due to chronic infection. Needless to say, foci of infection should be removed.

The anemia of syphilis, of course, usually responds to specific treatment. Of the types of anemia due to parasitic disease, that produced by the hookworm is said by Keefer and Yang to respond to liver and iron. Becker reported that the anemia caused by *Diphyllobothrium latum* responds to liver or liver extract, or, in a less degree, to the feeding of gastric tissue even before expulsion of the worm. To my knowledge no special diet has been recommended for the anemia of malaria.

Onions have had some reputation among the laity as being good blood builders, but it is of interest that Sebrell produced severe anemia in dogs by feeding large quantities of onions, and Whipple and his associates were not able to demonstrate any beneficial effect in dogs.

In the treatment of all forms of secondary anemia it is most important that the primary disease

be treated or cured in order to bring about the best results.

*Other Types of Anemia*—The so-called pernicious anemia of pregnancy has been reported by Strauss and Castle and others to respond to the use of liver. The simple anemia of pregnancy responds to liver and iron according to Keefer and Yang, whereas Strauss and Castle stated that liver extract is of no value, but iron is effective. Mussey, Watkins and their associates found fetal liver and extract of bone marrow of no value. Various other types of anemia occurring in pregnancy, such as true pernicious anemia, depend for treatment on the type of anemia present.

In acute aplastic anemia the feeding of raw fetal liver has been reported by Upham and Nelson with good result in one case. Liver extract was found ineffective by Edie. I saw one patient whose condition has been fairly well established who was well four years after institution of a diet of adult liver. Plastic anemia following the use of preparation of arsphenamine has no specific dietary treatment.

Recently a condition has been variously described as: Simple schlorhydric anemia, chronic microcytic anemia with small corpuscular diameters, idiopathic hypochromemia, idiopathic hypochromic anemia, anemia with achlorhydria, cryptogenetic hemoglobin deficiency anemia, and chronic chlorosis. The patients are usually middle-aged women, with anemia of the chlorotic type, usually achlorhydria and frequently glossitis, which has been notoriously resistant to treatment until large doses of iron were used. Berglund and Watkins found that fetal liver brought about improvement in such cases, and Giffin and Watkins found fetal liver effective in this type, and in secondary anemia due to a variety of causes. Witts stated that adult liver is of no value. The anemia accompanying the so-called hysterical dysphagia, or the Plummer-Vinson syndrome, which may be a variety of this anemia, has been found by Vinson, and by Moersch and Conner to respond to the use of plenty of muscle meat and iron. Whether the effect is due to the iron or meat or to a combination of both is not known. Wahlberg found that the condition of three patients with simple anemia and achlorhydria, responded to liver and that there was no difference in the effect of liver extract and whole broiled liver.

To my knowledge no dietary treatment has been suggested for splenic anemia but I have observed several patients with indeterminate probable splenic anemia accompanied by considerable

enlargement of the spleen who improved markedly after eating food rich in vitamins, and taking small doses of iron.

There is no specific dietary treatment for sickle cell anemia. The anemia following gastrectomy may possibly respond to the feeding of gastric tissue. I reported one such case which responded to the use of gastric tissue and iron. Dietary treatment of leukemia offers no encouragement. I have tried, as have others, the use of liver and I have also used spleen without effect. In the treatment of hemophilia Marlow gave liver without effect. Recently Birch obtained good results by the administration of desiccated ovary. Others have recommended a diet rich in protein. No diet has been found effective in the treatment of the various forms of purpura. I have tried a diet rich in vitamins without good effect, and liver has been given by other observers. No specific dietary treatment for polycythemia vera has been advanced, although several observers have recommended the use of a diet poor in protein, and others have administered splenic tissue. I have used the latter in two cases with results so far inconclusive.

Finally, it must be emphasized that an accurate diagnosis of the type of anemia present must be made before final treatment is decided on. If it is of the secondary type an attempt should be made to discover its cause. It is not uncommon to find that a patient has been treated with liver or with liver extract for what presumably was thought to be pernicious anemia, when, as a matter of fact, he was suffering from gastro-intestinal carcinoma or benign tumor. The tendency of gastro-intestinal carcinoma to be benefitted by the administration of liver may mask the symptoms of carcinoma for some time. In the presence of secondary anemia of undetermined origin the best interests of the patient will probably be served by administering liver or kidney and iron, or a diet rich in vitamins and iron, or one might try the effect of desiccated fetal liver. In any of these combinations a considerable amount of muscle meat, peaches, apricots, prunes and apples might be added with benefit. In some instances the diet may be of no value and iron may produce all the effect obtainable by both. No ill result, however, should occur from their simultaneous administration, even though the same results might be obtained by the administration of iron alone. Of course, such double treatment affords vague information concerning what material actually brought about recovery. It should be remembered that frequently very large doses of

iron (6 gm. ferric citrate or a dosage of other iron preparations representing an equal amount of metallic iron) are effective when smaller doses seem to be of little value.

TABULATION

Influence of Diet in Increase of Hemoglobin in Dogs  
(After Whipple and Robschelt-Robbins)

Daily Diet, Gm.	Increase of Hemoglobin in Two Weeks; Gm.
Bread, 450	3
Bread, 350	3
Milk, 450; Bread, 450	3
Milk, 450; Bread, 350	3
Cream, 100; Bread, 350	12
Cream, 100; Bread, 500	10
Butter, 100; Bread, 350	10
Butter, 75; Bread, 450	11
Cheese, 100; Bread, 450	20

Beef Muscle, 200; Bread, 400	25
Pig Muscle, 300; Bread, 300	20
Heart Muscle, 200; Bread, 300	28
Codfish, 100; Bread, 300	9
Fresh Fish, 250; Bread, 300	10
Spinach, 250; Bread, 400	14
Greens, 200; Bread, 300	20
Beef Liver, 400	100
Beef Liver, 300; Bread, 300	50
Chicken Liver, 200; Bread, 250	75
Fish Liver, 150; Bread, 350	0
Beef Kidney, 250; Bread, 250	90
Pig Kidney, 200; Bread, 350	70
Chicken Gizzard, 300; Bread, 200	85
Bone Marrow, Powdered, 30; Bread, 600	25
Beef Spleen, 200; Bread, 250	25
Brains, 300; Bread, 300	25
Pig Pancreas, 250; Bread, 350	30
Apricots, 200; Bread, 300	40
Peaches, 200; Bread, 300	40
Raisins, 300; Bread, 350	25
Apples, 250; Bread, 350	35
Prunes, 250; Bread, 350	35
Raspberries, 250; Bread, 350	0

## Undernutrition, with Special Reference to Metabolic Changes\*

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THE profound changes in the total metabolism of a starving individual emphasize the importance of physiological changes that occur in undernutrition. Du Bois<sup>1</sup> states that the most important phenomenon of undernutrition is the striking reduction in the metabolism. Following earlier and less complete studies, Benedict<sup>2</sup> has reported the findings of one starving subject, Levanzin, which include besides continuous body weight loss a marked decrease in heat production, a fall in systolic blood pressure, body temperature, pulse rate, and total nitrogen excretion, and increase in B-oxybutyric acid and ammonia nitrogen excretion. The ketosis is similar to that found in diabetes and appears as soon as the glycogen stores are diminished to below the level necessary for the combustion of the fatty acids.

While undernutrition does not often reach the stage of complete starvation, the latter may occasionally be noted in clinical work in comatose or psychopathic patients, cases of obstruction of the gastro-intestinal tract, and post-operative conditions. Less severe degrees of undernutrition are seen in a variety of conditions, such as fever, cardio-renal disease and new growths, etc., and from self-inflicted dietary fads. In undernutrition of less severe grade than starvation, tendencies such as lowering of the basal metabolism, blood pressure, and pulse may be present and demonstrable and do tend to emphasize the importance of the nutritional

state of the individual. The influence of partial starvation is well illustrated by Magnus-Levy's<sup>3</sup> description of a neurasthenic youth who partly starved himself for a year or more. On entrance to the hospital he was skin and bones. During the first experimental period, he received his former dietary containing between 700 and 800 calories daily and later received an abundant diet. On the low diet, the basal metabolism was minus 33%; on the liberal diet, plus 2%. This indicates that a normal individual who has lost weight by at least 30% from a low dietary, may have a basal metabolism 33% below the normal per square meter of body surface. Incidentally, it is interesting to note that the metabolism of the emaciated diabetic may not fall as much as that of the emaciated normal, due somewhat, according to Lusk,<sup>4</sup> to the high protein metabolism of the diabetic.

It may be emphasized here that the basal metabolism in undernutrition tends to be below normal levels. This is well illustrated in the study by Benedict and others<sup>5</sup> of twelve athletic young men who were reduced from 3200 to 3600 net calories a day to a diet of 1400 calories for three weeks but who maintained their usual mental and physical activities. The basal metabolism fell about 18 per cent lower than at the beginning of the study. The pulse rate was greatly lowered and the systolic and diastolic blood pressures were distinctly reduced. Weakness and lack of drive were noted,

\*Especially written for The Journal-Lancet Nutrition Number.

also sub-normal gymnasium performance. Such a lowering of basal metabolism has been referred to as a probable protective mechanism and does not indicate any causative or primary hypothyroid state. Indeed, under such conditions because of a reported low basal metabolism, thyroid extract has sometimes been given inadvisedly, when an increase in food was properly indicated. However, in chronic inanition with depression of the basal metabolism, thyroid extract or thyroxin has been used with benefit in selected cases. It may be stated that the weight of an individual, except for water loss, represents mathematically the balance between energy intake and outgo.

Scarcely any more important and definite objective clinical finding than weight loss exists. While certain subjective symptoms on account of their indefinite nature may elude interpretation, weight loss has a cause which is of definite significance with regard to the individual complaint. Valuable actuarial tables of normal weight are available, and the normal deviations therefrom of plus or minus 10% must be interpreted in view of the fact that occasionally the normal individual may be at either margin of those limits or beyond, particularly in the extremes of the hypersthenic and hyposthenic types. The general favorable influence shown by such tables of normal or underweight compared with overweight beyond the third decade of life should be mentioned. Especially significant is an unaccounted for change from a weight level that has been maintained for an appreciable period of time; a weight level which, while possibly above normal, had represented that individual's adaptation of energy intake and outgo. A weight loss from that level is especially significant, in contrast to the rather labile character of weight apparent in some individuals dependent upon transient change in dietary and activities. In other words, of especial significance is the unexpected weight change from the individual's own weight level which he has maintained over a considerable period of time.

The asthenic type of individual not infrequently underweight requires careful consideration. Quite occasionally normal individuals of this build, of weight possibly slightly below average normal standards, have had an increased dietary that was neither indicated nor permanently effective. It would seem that such individuals, if free from disease and on adequate diet, and unless some special symp-

tom requires explanation, should be considered to be in a normal nutritional state. Blunt and Bauer<sup>6</sup> found that the basal metabolism of sixteen underweight college women leading apparently normal lives was only slightly lowered. Often heredity indicates the uselessness of attempting to change the nutritional state of such individuals. Hereditary factors may incorrectly bear the blame, of course, for chronic inanition which through childhood and into adult life has been due to inadequate dietary or to chronic infection or metabolic disturbance. Each individual case must be studied to determine the cause. When marked dental caries and pyorrhea exist, clearing of oral infection with proper dental restoration may quite universally be expected to improve the nutritional state of the individual. Diet fads have been followed by some individuals to the extent that a moderate and possibly insignificant overweight has been changed to a definite state of undernutrition with its possible unfavorable sequelae including increased susceptibility to infection. Sometimes perfectly simple explanations of weight loss such as the anxiety states, with anorexia nervosa, may be overlooked by the physician in the search for some organic disease as the source. Likewise, noncritical examination of the neurasthenic patient may overlook a causative tuberculous process or other infection.

Weight loss, which is so often the presenting complaint of the patient, is a very important symptom of the metabolic group of diseases. Diabetes mellitus as a cause of weight loss is revealed by a complete examination. Hyperthyroidism, where the weight change is not great and the other signs not high grade, is sometimes not detected. Altogether, it may be said that weight loss, not due to diabetes mellitus or chronic infection, and occurring in spite of normal or increased caloric intake, is practically always associated with the increased basal metabolism of the hyperthyroid states. Cyclic variation in hyperthyroidism should be borne in mind in interpreting the variations in weight sometimes revealed by careful consideration into the patient's nutritional history.

In the decades of an individual's life when there develops an increased tendency to malignancy, persistent study of weight loss not otherwise accounted for often finds its ultimate explanation in new growth. In malignancy, the variability in the occurrence of

*(Continued on Page 597)*

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### DIET AND THE MEDICAL PROFESSION

The study of the daily food requirements of the human body has opened new vistas in the outlook of the medical profession. Beri-beri, xerophthalmia, rickets and pellagra have resulted in much suffering, deformity and untimely death for centuries. Scurvy retarded progress in the world's development and all but prevented Columbus from completing his voyage in 1492. Many absurd causes, such as atmospheric conditions, have been advanced as the source of these diseases. The discovery of the properties of a vitamin by Funk in 1911 ushered in a period during which careful scientific observation and study has cleared these obscure diseases, and their prevention has proved effective. Most of this has been brought about through the contributions to our knowledge of various vitamins.

The study of the diet of the white rat by the tedious, laborious and time-consuming work of Jackson, Donaldson and others had resulted in a wealth of detail. They knew its normal growth curve, its average length of life, and its responses to different kinds of food in varying amounts. Having shown that one year of the white rat's life is equal to thirty years of human life, they even knew how its tissues at different ages in life compare with those of man. At the end of the first year of life, the tissues of the rat are comparable to those of a human being at the age of thirty years. Fortunately, therefore, a laboratory animal, whose life cycle had been investigated, was available when the time arrived for the practical biological application of vitamin studies. At that time, vitamins could not be

isolated and analyzed chemically. Since then we have reaped a harvest of information on vitamins.

Out of numerous studies has come the discovery of several vitamins which have been designated A, B, C, etc., Jackson says: "It is not at all likely, however, that the list of vitamins is finally exhausted. Some or all of the vitamins now recognized are probably composite in character, and other undiscovered factors doubtless exist. . . . It is, indeed, quite possible that before the knowledge of nutrition is complete all the letters of the alphabet will have been insufficient to designate the various vitamins and similar dietary factors involved."

With the announcements of the discovery of the vitamins, however, food faddists flourished, largely because we had failed to teach the fundamentals of health in the schools of this country. A public ignorant of the daily food requirements of the human body grasped at the spinach fad and the yeast fad. Then came the iron fad, the liver fad, the whole wheat bread fad, the peanut fad, and many others, each following certain scientific discoveries. Because of the failure to teach the fundamentals of diet in our schools, the physician is compelled to teach them himself whenever he finds a patient whose diet needs to be changed or regulated, whether it be for obesity, diabetes, or some other condition.

It is truly remarkable how the health of the people has been improved through what at one time appeared so simple a factor—*diet*. Pure deficiency diseases have been controlled; those somewhat dependent upon certain deficiencies in diet, such as respiratory diseases, are coming under control; the large group of diabetics are now receiving adequate nourishment; many sufferers from pernicious anemia are now living longer, thanks to the work of Murphy and Minot; and in general the length of life is being increased through the proper control of diet.

In this special number of the JOURNAL-LANCET,

Dr. Anderson is presenting an excellent survey of articles written by experts, who deal with foods in their relation to health and disease. The physician should not only use this knowledge among the families of his clientele, but should also disseminate it among the public everywhere. As new scientific facts pertaining to foods are from time to time, developed the medical profession must carefully interpret them for the public to prevent their misuse by the faddists. The public must learn of these facts through the proper sources. Otherwise, as in the past, food fads will be practiced which cast reflections upon our educational system, which do harm to food producers which do the public in general no good, and which even jeopardize the health of large numbers of people.

J. A. M.

#### FOOD FOR THOUGHT

Ever since the eating of the fatal apple, food has played a leading part in man's salvation. He has used it and abused it, praised it and cursed it until great confusion has arisen as to its true merits.

Primitive man, in his physical struggle, was not so much concerned with a varied diet as a sufficient one. He ate in order to survive and was not interested in observing the physiological effects of different foods. It was not until civilization began its march that man bothered much about the precious ingredients in his diet. Then, step by step, he began to refine his food to please his palate and also to experiment with his diet to learn of its nutritive virtues. It is the former step that prevailed during the feasts of the Romans and during the seventeenth and eighteenth centuries when as many as forty different dishes would grace the diner's table. It is the latter phase that characterizes our modern era with its fruitful contributions to the science of nutrition.

The rapid advancements during the past few years toward a better understanding of food values have escaped the serious attention of most of us. We have heard of them, to be sure, but we have failed to embrace them in a practical way. We have not attempted to apply them to the practice of medicine in as thorough a manner as their merits warrant.

In this special Nutrition Number, which THE JOURNAL-LANCET herewith presents to the Medical profession, will be found the latest opinions and works of modern science in the field of nutrition. It contains food for the dreamer

and practical dietary points for the doer. It is offered in the hopes that students of medicine may turn a more attentive eye to the science rather than to the art of eating.

Arnold S. Anderson, M. D.

#### ANTIRACHITIC MILK

About forty years ago, when Ignatius Donnelly was "the most popular man in Minnesota—between elections," he prophesied in his book, "Caesar's Column," as we now recall it, that the prescribing of medicines would soon be discarded except when administered as foods.

That sounded amusingly revolutionary then, and even with the great strides in dietetics during the intervening years, only recently has this prediction had some semblance of fulfilment. We are thinking, in this connection, of such foods as have been shown to contain iron, iodine, calcium and phosphates and lately it has been vitamine this and vitamine that.

Now irradiated milk has come to be heralded as a great remedy in rickets. It is found that milk may be activated by means of carbon arc rays to make it highly antirachitic, and the practical value of an effective remedy in this form becomes at once apparent, not only because it is served as a universally acceptable food but especially as calcium and phosphorus is supplied at the same time.

When it comes to the progress of medicines, we have learned to hold no predictions in scorn or contempt.

A. E. H.

#### HUMAN MILK

Despite the advances that have been made in the science of nutrition, mother's milk still remains distinctly superior to artificial food used for the feeding of young infants. Breast milk, however, is not a product with a uniform and fixed chemical composition. That secreted by different mothers varies greatly in quantity and quality, and at times it may fail to satisfy the baby's nutritive requirements.

Inadequacy with respect to the amount of milk supplied by the breast can usually be ascertained quite readily; and present methods directed toward maintaining production at the maximum limit, determined by the physiological capacity of the gland, include complete drainage of the breast at regular intervals and the promotion of good health and optimum nutrition on the part of the mother.

In recent experiments Corner was unable to cause proliferation of the mammary gland beyond

the stage normally attained at puberty by administering corpus luteum extract to non-pregnant spayed rabbits. Without previous preparation by giving corpus luteum, Corner found that administration of extracts of whole sheep's hypophysis to spayed virgin rabbits caused proliferation of the breast and simultaneous lactation which in two weeks was practically indistinguishable from that present at full term gestation. Whether or not the opening of a new field of hormonal control of lactation is at hand which will yield additional valuable methods for influencing the quantity and quality of breast milk remains to be seen.

The production of milk places a heavy drain on the maternal resources, which according to Macy and co-workers may equal thirty to fifty per cent of the daily caloric intake. This extra demand on the mother can be met usually so far as calories are concerned by augmenting the nutrients ingested, but to maintain an abundant flow of milk without permitting simultaneous diminution in the mother's supply of minerals is difficult. For example, Macy et al., were unable by any known method to prevent negative calcium and phosphorus balances from developing during periods of profuse lactation, even though the intake of these inorganic substances exceeded that required for the amount of milk secreted by a liberal margin.

Variations in the maternal diet are reflected in the composition of the milk secreted. Hoobler maintains that different types of proteins unmistakably influence mammary secretion and Dagg reports that liver was a better source of protein for lactation in dogs than either egg or round steak. With liver as the source of protein, the milk was<sup>4</sup> superior with respect to amount, fat content, and rate of growth it promoted in pups.

Since the human body cannot synthesize vitamins to be present in breast milk, they must be supplied through the diet of the mother. According to Macy and Outhouse, human milk seems devoid of Vitamin D and contains less Vitamin B complex than does cow's milk. With respect to protein, fat, carbohydrate, inorganic salt content and fat-soluble A, human milk is an excellent food of high nutritive value. Its deficiencies in Vitamins B, C and D, however, requires making certain additions to breast milk therefore, if one expects to provide optimal nutrition for growing babies.

The influence of the mother's diet during lactation, not only in preserving the integrity of her

tissues but also in modifying the quality and quantity of milk secreted by the breast, is a question of sufficient importance that special attention to maternal nutritive requirements is imperative.

C. A. S.

## UNDERNUTRITION, WITH SPECIAL REFERENCE TO METABOLIC CHANGES

(Continued from Page 594)

weight loss is remarkable, particularly in the early stages, when no appreciable change may occur. Due to this fact, no general statement regarding the relationship between weight loss and malignancy may be made, but the occurrence of weight loss from starvation tends to be greater in obstructive lesions of the gastro-intestinal tract.

In conclusion, it should be emphasized that an appreciable change in the weight level of the individual demands explanation and that the disturbing factor between energy income in caloric intake and outgo in energy expenditure is always definite even if not readily demonstrable. The increased level of metabolism as in hyperthyroidism may be at fault, or paradoxically, the basal metabolism may be reduced as the result of starvation either partial or complete; or there may be no energy imbalance, as in the water loss that occurs following circulatory restoration in cardiac decompensation. Whether obstructive factors such as new growths cause partial starvation or whether toxic and infectious factors interfere with cellular nutrition or appetite resulting in the inadequate intake of food, weight loss requires for its correct interpretation an appreciation of certain physiological facts, some of which have been enumerated. If proper fundamental concepts and causes are kept in mind, the treatment of weight loss will be broad enough to remove causes where possible and to amplify inadequate dietary where that is at fault, and will never be routine but will rather follow the individual study of each case.

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SOCIETIES
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Program of the International Assembly of the  
Inter-state Postgraduate Medical Association  
of North America, Indianapolis, Ind.,  
October 24, 25, 26, 27, 28, 1932

## MONDAY, OCTOBER 24TH

- Diagnostic Clinic* (Surgical). Dr. Edward W. Archibald, Montreal, Canada.  
*Diagnostic Clinic* (Medical). Dr. R. W. Scott, Cleveland, Ohio.  
*Diagnostic Clinic* (Surgical). Dr. E. Starr Judd, Rochester, Minn.  
*Diagnostic Clinic* (Medical). Dr. O. H. Perry Pepper, Philadelphia, Pa.  
*Diagnostic Clinic* (Surgical). Dr. John M. T. Finney, Baltimore, Md.  
*Diagnostic Clinic* (Surgical). Dr. Donald C. Balfour, Rochester, Minn.  
*Diagnostic Clinic* (Medical). Dr. Elsworth S. Smith, St. Louis, Mo.

## TUESDAY, OCTOBER 25TH

- Diagnostic Clinic* (Surgical). Dr. George P. Muller, Philadelphia, Pa.  
*Diagnostic Clinic* (Medical). Dr. David P. Barr, St. Louis, Mo.  
*Diagnostic Clinic* (Gynecological). Dr. John R. Frascr, Montreal, Canada.  
*Diagnostic Clinic* (Surgical). Dr. Frank H. Lahey, Boston, Mass.  
*Diagnostic Clinic* (Medical). Dr. Lewellys F. Barker, Baltimore, Md.  
*Diagnostic Clinic* (Surgical). Dr. Eugene H. Pool, New York, N. Y.  
*Diagnostic Clinic* (Medical). Dr. Warfield T. Longcope, Baltimore, Md.

## WEDNESDAY, OCTOBER 26TH

- Diagnostic Clinic* (Medical). Dr. Cyrus C. Sturgis, Ann Arbor, Mich.  
*Diagnostic Clinic* (Surgical). Dr. Irvin Abell, Louisville, Ky.  
*Diagnostic Clinic* (Pediatric). Dr. Alan G. Brown, Toronto, Canada.  
*Diagnostic Clinic* (Surgical). Dr. Arthur Dean Bevan, Chicago, Ill.  
*Diagnostic Clinic* (Pediatric). Dr. William McKim Marriott, St. Louis, Mo.  
*Diagnostic Clinic* (Surgical). Dr. John F. Erdmann, New York, N. Y.  
*Diagnostic Clinic* (Pediatric). Dr. Harold B. Cushing, Montreal, Canada.  
*Diagnostic Clinic* (Surgical). Dr. Dean D. Lewis, Baltimore, Md.

## THURSDAY, OCTOBER 27TH

- Diagnostic Clinic* (Surgical). Dr. John J. Moorhead, New York, N. Y.

- Diagnostic Clinic* (Urological). Dr. William E. Lower, Cleveland, Ohio.  
*Diagnostic Clinic* (Medical). Dr. Charles A. Elliott, Chicago, Ill.  
*Diagnostic Clinic* (Urological). Dr. Hugh H. Young, Baltimore, Md.  
*Diagnostic Clinic* (Surgical). Dr. William Darrach, New York, N. Y.  
*Diagnostic Clinic* (Medical). Dr. Campbell P. Howard, Montreal, Canada.  
*Diagnostic Clinic* (Urological). Dr. Hugh Cabot, Rochester, Minn.

## FRIDAY, OCTOBER 28TH

- Diagnostic Clinic* (Medical). Dr. Emanuel Libman, New York, N. Y.  
*Diagnostic Clinic* (Surgical). Dr. George Crile, Cleveland, Ohio.  
*Diagnostic Clinic* (Medical). Dr. Henry A. Christian, Boston, Mass.  
*Diagnostic Clinic* (Medical). Dr. Elliott P. Joslin, Boston, Mass.  
*Diagnostic Clinic* (Surgical). Dr. Charles H. Frazier, Philadelphia, Pa.  
*Diagnostic Clinic* (Medical). Dr. Harlow Brooks, New York, N. Y.  
*Diagnostic Clinic* (Surgical). Dr. William D. Haggard, Nashville, Tenn.

NEWS ITEMS
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Dr. T. M. Joyce formerly of Bridgemaids, N. D., died recently on the west coast.

Fire of undetermined origin recently destroyed three buildings at McGregor, Minn., including the village hospital.

Dr. H. W. White has moved from Aberdeen, S. D., to Isabel, S. D., where he is continuing his general practice.

Dr. John Carlson has opened offices at Westbrook, Minn., where he will conduct his practice of general medicine.

Dr. O. A. Knutson of Larimore, N. D., has taken over the Greenbush, Minn. Hospital and the practice of Dr. A. J. Button.

The Woman's Auxiliary of the Hennepin County Medical Society will hold their Fall meeting at the home of Mrs. J. M. Hayes, October 7.

Dr. B. A. Fine formerly of St. Paul Minn., is now locating at Winsted, Minn., where he will continue the practice of medicine and surgery.

Dr. Mary Strickler who practiced medicine at Sleepy Eye, Minn., for many years has returned after an absence of three years and will resume her practice.

Dr. Edwin L. Goss, of Montesano, Wash., returned to Carrington, N. D., where he had been in practice for 26 years previous to his leaving two years ago.

Dr. Victor E. Johnson, a recent graduate of the University of Minnesota Medical school has located at Worthington, Minn., where he will practice medicine and surgery.

Dr. E. S. Mariette, Superintendent of Glen Lake, Minn., Sanatorium was elected President of the Mississippi Valley Conference on Tuberculosis at the conference in Indianapolis, Ind.

Dr. A. D. McCannel of Minot, N. D., attended the International Medical Convention at Montreal, Canada. Mrs. McCannel accompanied him and they spent the remainder of the month visiting in eastern cities.

The Mississippi Valley Sanatorium Association elected the following doctors at their recent meeting at Indianapolis: H. C. Sweany, Chicago, Ill., President; M. H. Draper, Ft. Wayne, Ind., Vice President; A. A. Plyte, Milwaukee, Wis., was re-elected Secretary and Treasurer.

While the tuberculosis death rate increased in 67 cities in the United States during 1931 a big drop was recorded in Minneapolis. The death rate per 100,000 persons decreased from 25.3 in 1930 to 18.8 in 1931. The reduction in death rate can be traced to early diagnosis and immediate treatment.

Dr. J. C. Litzenberg, Minneapolis, professor and head of the department of obstetrics and gynecology at the University of Minnesota Medical school, was elected president of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons at their annual meeting at French Lick Springs, Ind.

The following doctors were elected at the recent meeting of the Southern Minnesota Medical Association meeting at Rochester: R. V. Williams, Rushford, President; H. C. Habein, Rochester, First Vice President; W. H. Valentine, Tracy, Second Vice President; M. C. Piper, Rochester, Secretary and Treasurer.

The Northern Minnesota Medical Association elected the following officers at their recent meeting at Crookston, Minn. Dr. B. J. Branton, Willmar, President; Dr. Owen W. Parker, Ely, Vice President; Dr. O. C. Larsen, Detroit Lakes, Secretary and Treasurer. Wilmot, Minn., was chosen as the 1933 conference site.

Mr. Sam C. Hoen, of St. Paul, Minn., a licensed

masseur, entered a plea of guilty of practicing medicine without a license before the Honorable John Boerner, judge of the District Court of Ramsey County, and was sentenced to one year in the St. Paul workhouse, and put on probation for the next twelve months. He will have no license whatever to practice healing in the future.

The joint meeting of the Upper Mississippi Valley and the Stearns Benton County Medical Societies was held at Little Falls, Minn., September 22. The meeting was preceded by a meeting of the Council of the Minnesota State Medical Association. Members of the Council provided the subsequent joint society program. Speakers were Drs. M. S. Henderson, Rochester; J. M. Hayes, Minneapolis; Herbert Z. Giffen, Rochester, and W. A. Coventry, Duluth.

The Minnesota State Medical Association Bulletin in its recent issue warns the public that refreshments dispensed on the streets on highways are potential sources of disease. It says, "The food itself is not at fault but the trouble comes from the unsanitary methods of distribution and that the vendors themselves may be carriers of disease." Street corner vendors are not subject to the regulations that govern restaurants, drug stores and grocery stores, and are therefore difficult for officials to control.

The Southwestern Minnesota Medical Society held their Annual meeting in the new Indian School Hospital, Pipestone, Minn. Sept. 20. A banquet was served at 6:30 p.m. after which a program was given by the Indian children. The following officers were elected. Dr. J. T. Rose, Lakefield, Minn., President. Dr. H. DeBoer, Edgerton, Minn., Vice-President. Dr. E. G. McKeown, Pipestone, Minn., Secy-Tres. Dr. S. A. Slater, Worthington, was elected Delegate and Dr. C. O. Wright as alternate. The following doctors were elected censors for three years: C. P. Dolan for Nobles County, L. A. Williams for Murray County and Walter Halloran for Jackson County. The following doctors from Sioux Falls, S. D., gave the program: T. J. Billion, "Hypothyroidism with Case Report;" M. A. Stern, "Appendicitis in Children;" G. E. Van Demark, "Foot Posture," and N. J. Nessa, "X-ray studies in diseases and injury of joints."

Dr. J. A. Myers, Minneapolis, Professor of Medicine at the University of Minnesota and Chief of Medical Staff of the Lymanhurst School for Tuberculous Children, Minneapolis, has arranged with the Extension Division of the Uni-

versity of Minnesota to offer a course of seventeen lectures on tuberculosis to graduate physicians this year. These lectures have been planned in response to requests from a large number of busy practising physicians who want to inform themselves thoroughly on the rapid modern advances in the management of pulmonary tuberculosis and allied conditions. The lectures will begin Thursday, Oct. 6, 7:30 to 9:30 p. m., in the Eustis Amphitheater at the University of Minnesota, and continue at the same hour and place weekly for the seventeen weeks of the semester. Following are the subjects to be discussed and demonstrated during the course: 1. Diseases of the lungs, including diagnosis and treatment of septic conditions, such as bronchiectasis and pulmonary abscess. 2. Demonstrations of iodized oil administration. 3. Treatment of bronchial asthma associated with hay fever, etc. 4. Diagnosis of pneumoconiosis with particular reference to silicosis as found among stone cutters. 5. Carcinoma of the lungs, with special reference to diagnosis. 6. Tuberculosis presented in its various manifestations from the beginning of the first infection type through all stages to termination with the re-infection type. The course will cover all forms of treatment. Use of X-ray, demonstration of modern diagnostic preceding and administration of therapeutic measures will be given. Ample opportunity will be allowed for examination of patients. Registration should be made immediately with Mr. R. R. Price, Director Extension Division, University of Minnesota. The \$10 registration fee covers all expenses of the course.

### CLASSIFIED ADVERTISEMENTS

#### TECHNICIAN

Technician and registered nurse would like position in a clinical laboratory or doctor's office. Good references. Address Box 935, care of this office.

#### X-RAY MACHINE WANTED

An x-ray in perfect condition wanted. State price and make of machine in first letter. Address Box 930, care of this office.

#### PRACTICE FOR SALE

Splendid opportunity available at once for one or two capable physicians to take over established practice in good Minnesota hospital town. Nothing to buy. Address Box 938, care of this office.

#### FOR RENT

Doctor's office in new office building, in best business and residential district. Pleasing reception room.

Up-to-the-minute examination rooms. Individual treatment rooms and laboratory. Free gas, free compressed air. Best opportunity for increasing practice or for beginner. Address Box 929, care of this office.

#### PHYSICIAN WANTED

Physician wanted to take over established office. Joint office in connection with dentist, use joint reception room. Present physician moving and will sell some equipment very reasonable. Located in Minneapolis near the Loop. New building. Address Dr. E. L. Ness, 344 E. Franklin Ave., or phone Bridgeport 4743, Minneapolis.

#### WANTED TO PURCHASE

Wanted to purchase at once for cash. Oak or mahogany physician's desk and examining table, enamel instrument cabinet, diathermy and alpine light. Please state condition and type of same with price in first letter. Address Box 939, care of this office.

#### WANTED

A Sanatorium staff physician with institution experience, preferably a northwest resident, married or single, but without other dependents. Reference required. Salary limited. Board, room and laundry included. Must be open for service October 1st, or at least by the New Year. Position permanent. Address Dr. J. A. Myers, 730 La Salle Building, Minneapolis.

#### FOR SALE

Five bed hospital in Minnesota. The chance of a lifetime. Hospital, office and residence combined. Am retiring; sell 50 cents on the dollar. \$5,000 cash, balance easy terms. Address Box 933, care of this office.

#### DOCTOR'S OFFICE ASSISTANT

Young lady, 24 years old, wants position as doctor's office assistant in Minneapolis. Knowledge of medical history, medical terms and psychology. Six months' experience with dental technician. Address Vera Garnet, 4127 Illinois Ave., Minneapolis. Phone Walnut 5187.

#### RECENT GRADUATE

Recent graduate, single, interested primarily in internal medicine and pediatrics, wishes work with physician or surgeon. Opportunity to learn and to be associated with a high grade man considered of more importance than income. Address Box 936, care of this office.

#### HOSPITAL LOCATION

Ideal location for hospital in Red River Valley. Good farming community. No hospital in radius of 35 miles. Community willing to assist in development of this project. Large 16 room house, all modern conveniences, steam heat, beautiful surroundings. State plans in first letter. Address C. C. Lake, 2615 Park Ave., Minneapolis.

# THE JOURNAL-LANCET

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**Minnesota, North Dakota, South Dakota, and Montana**  
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**North Dakota and South Dakota State Medical Associations**

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## Surgical Clinic\*

OWEN H. WANGENSTEEN, M.D.  
*Minneapolis*

### CASE 1: INTESTINAL FISTULA

**T**HIS woman, aged 62, had her first operation 37 years ago and has had nine or ten of a major character since. In 1895, she had an excision of an ovarian cyst. In 1908, the appendix was removed, following which a bowel fistula persisted for eight years. The fistula was then closed operatively and remained closed. Shortly afterward she was operated upon for hernia in the wound and she subsequently had an operation upon the gall-bladder followed by a spontaneous reoccurrence of the bowel fistula and four or five unsuccessful operative attempts have been made to close the fistula.

Occasionally in acute suppurative appendicitis there is a phlegmon of the base of the caecum and appendectomy is followed by fistula. Usually, however, such a fistula persists only temporarily and closes spontaneously. Now and then a secondary closure has to be done. The occurrence of fistula after appendectomy occasionally portends the presence of more serious disease in the caecum, such as tuberculosis, actinomycosis, or malignancy. In view of the duration of the persistent fistula and the general good health of the patient it is most unlikely that any of these conditions are present here. The patient tells me that when given an enema no water comes out through the fistula, so we are fairly certain that this fistula is not in the colon. The excoriation of the skin

about the fistula also strongly suggests its presence in the small intestine.

Occasionally, the engagement of a short loop of bowel in the wound of the abdominal parieties during convalescence incident to straining may cause a necrosis of part of the bowel wall with ensuant fistula. Much more frequently, however, one sees patients who have recovered from their peritoneal infection consequent upon a ruptured appendix, but who have come for a persistent fistula attending the employment of enterostomy performed as an auxiliary therapeutic measure at the time of appendectomy. As a matter of fact this is not such an unusual occurrence. Now and then one hears it said that patients with peritonitis die of absorption from the bowel and not from the peritoneal infection. I am not aware of any proof that abnormal absorption occurs from the bowel in such instances. There is on the contrary considerable concrete evidence which indicates that normal absorption is retarded in a dilated bowel whose walls are viable.

In doing an appendectomy for acute suppurative appendicitis, I think it wise not to do enterostomy. The chief source of gas in the bowel is swallowed air and nasal suction offers a satisfactory mode of dealing with most cases of distension. Drainage of the bowel is only indicated in mechanical obstruction of the gut. When doing enterostomy for mechanical obstructions, one should employ a small catheter (No. 14 French). The employment of a tube the size of a garden

\*Informal clinic at the annual session of the North Dakota State Medical Association, Grand Forks, June 1, 1932.

hose is likely to be followed by a persistent fistula. The multiple purse string suture kinks the bowel and when the catheter comes away, obstruction may obtain at the site of enterostomy resulting in a persistent external fistulous communication. If one employs the Witzel type of enterostomy in which a peritoneal tunnel of about 3 inches in length is made and a small catheter is employed, leakage will not occur when the catheter comes away.

Fistulae of the small bowel can be very troublesome. If the fistula is high and fairly complete, it will interfere seriously with the patient's nutrition. In addition, the strongly alkaline pancreatic juice results in a rapid digestion of the skin. In instances in which the amount of discharge is considerable, the employment of suction in the wound as recommended by Dr. Angus Cameron is a very valuable therapeutic adjunct. It prevents digestion of the skin and permits the fistulous opening to heal more readily. When the loss of fistulous fluids through a fistula becomes disturbing, it is best to make a direct attack upon it to close the fistulous opening or to make an enterostomy opening distalad into which the fluids that escape may be placed. When the amount of fluid lost through the fistula is not alarming, but the excoriation of the skin becomes bothersome the application of "Bovine" to the wound as suggested by Dr. Potter of St. Joseph, Missouri, will often result in a rapid and startling improvement in the appearance of the skin. This beef juice offers the pancreatic juice a pabulum, the digestion of which results in the inactivation of the juice and a sparing of the skin. The prone position on the Bradford frame also offers an alternative method of dealing with certain types of bowel fistula.

As to the technique of closing an intestinal fistula such as this, I am disposed to cut down upon it by an elliptical incision circumventing the external opening. I deliberately open the peritoneal cavity and carefully examine the distal bowel to exclude persistent obstruction below. In the majority of instances the fistulous opening can be closed by a plastic procedure, making the suture in the transverse axis of the bowel. Occasionally it is necessary to excise a small segment and make an end to end anastomosis. Dr. Coffey of Portland has given the problem of intestinal fistula very deliberate study and advocated extra-peritoneal closure when feasible. Experience with a fairly large number of cases of fistula of the small intestine has convinced me that a more satisfactory closure can be obtained by

opening the peritoneal cavity and the factor of persistent distal obstruction when present can be adequately dealt with. I have seen no harm come from a deliberate opening of the peritoneal cavity in such cases. Fistulous openings in the colon may well be closed by the extra-peritoneal method, except fistulous openings in the caecum, which are best dropped back into the peritoneal cavity after suture. Having once observed the supervention of obstruction following the closure of a fistula in a patient in whom a considerable length of the small intestine had been shunted out of activity for a long time, I made it a rule in subsequent cases to establish a proximal enterostomy to serve as a safety vent in case of need. In more recent years, however, I have abandoned this protective measure and have found that nasal catheter suction siphonage serves the purpose just as well.

This patient's fistula I believe can be satisfactorily closed by such a method without much risk.

#### • CASE II: CHRONIC EMPYEMA

DR. CAMPBELL: This boy about a year and a half ago had an acute empyema and a rib resection. There was a fistula leading through the lung and he coughed up considerable pus. This boy has carried tubes for over a year, but he is in fairly good health. He goes to school every day and feels well. He still wears a tube and is presented to get Dr. Wagensteen's judgment as to the best thing to do at present.

DR. WAGENSTEEN: X-ray films made of this boy's chest at intervals over the past year show that there has been considerable expansion of the lung since drainage of the empyema was established. At the present time, the injection of a few cubic centimeters of fluid suffices to fill the drainage tract. This observation tends to show that the large cavity apparent on some of the earlier films has been completely obliterated by the expansion of the lung and that treatment may now be abandoned. It might be well, however, before removing the drainage tube entirely to take a Roentgenogram of the chest after the injection of a little lipiodol to ascertain whether the few cubic centimeters of fluid that can be injected penetrate into the thoracic cavity for some distance or only through the parieties of the chest wall.

I have followed with considerable interest a few patients who objected to continuance of treatment for empyema after they were rendered afebrile by drainage. One of these still has a very large unobliterated cavity, about two years after

drainage through the drainage site is closed. Fortunately to date, he has had no recurrence of trouble. The more usual observation is, however, that such patients are liable to recurrence because of persistent infection in the walls of the cavity unless it is obliterated.

Delayed, improper, or inadequate drainage and cessation of treatment with disappearance of symptoms are the chief factors contributing to chronicity in empyema. Drainage rids the patient of the infection and permits the lung in massive collections of exudate to expand to an extent probably somewhat less in volume than the quantity of exudate drained off. Irrigation of the pleural cavity with Dakin's solution exerts a lytic action on the fibrinous masses and adhesions, which under persistent efforts at increasing intrapulmonary pressure by the use of "blow-bottles", gradually give way, permitting the lung to re-expand and fill the thorax.

A persistent broncho-pleural fistula such as this boy had for a time also contributes to chronicity. Fortunately in most instances, however, such fistulae are only temporary and usually close after the institution of drainage. It probably should be remarked, however, that irrigation and attempts at expanding the lung by increase of intrapulmonary pressure are contradicted in the presence of a persistent fistula. Osteomyelitis of a rib or the persistent presence of a foreign body or lost drainage tube in the empyema cavity are infrequent causative agents of persistent drainage.

In operating upon chronic empyema with large residual cavities the commonly employed procedure is to bring the chest wall to the lung by rib resection. When the cavity is small, the excision of a short segment of one, two, or three ribs directly over the cavity is usually followed by cure. When the cavity is large it is best to do a paravertebral excision of ribs because a more generous collapse is obtained by less sacrifice of the bony thorax and with much less deformity. In several instances, I have found it possible to decorticate the lung by peeling off its surface a thin membrane (thickened visceral pleura), the removal of which permitted the lung to expand into the wound at once. The procedure of decortication has not found general favor amongst thoracic surgeons partly because of its somewhat greater difficulty and partially because of the belief that a lung long bound down is atelectatic and will not expand. I have once re-expanded such a lung by decortication that had been held restrained for nine years, six opera-

tions having been done in the interim to collapse the cavity. When a previous parenchymatous lesion in the lung has obliterated the planes of cleavage, attempts at decortication are usually unsuccessful.

In dealing with chronic empyema of large extent one should adapt the magnitude of the operative procedure to the patient's condition. Whereas, in the management of acute empyemas a certain mortality necessarily obtains because of virulent infections when dealing with patients that are reasonable operative risks in chronic empyema, the risk should be minimal.

#### CASE III: ARRESTED PULMONARY TUBERCULOSIS

DR. MACLACHLAN: This boy, aged 26, was admitted to San Haven in 1929, with an advanced case of tuberculosis. About a week after his entrance he was given pneumothorax on the right side. This treatment was continued at intervals of one week for several months, using 500 c.c. of air at the beginning and when he left about 300 c.c. I understand the same treatment is being administered here. The patient was discharged from San Haven on May 3, 1931, as an arrested case.

DR. WANGENSTEEN: A few years ago it would have been considered presumptuous for a surgeon to discuss the treatment of pulmonary tuberculosis, but within the last two decades a reversal of the order of things has come about in the management of tuberculosis. Prior to that time the surgeon had a lively interest in the operative treatment of tuberculosis of the lymph nodes and peritoneum. Today by general consent these cases are largely treated conservatively with the remedial measures of bed rest, good food, fresh air, and sunshine that have long had an important role in the successful treatment of pulmonary tuberculosis. The local lesion is treated with heliotherapy or light doses of X-ray or both. Fluctuating areas in softened lymph nodes are aspirated to protect the skin and occasionally broken-down necrotic lymph nodes are best curetted out. Surgeons have been somewhat more reluctant to give up removal of ascitic fluid by laparotomy in tuberculous peritonitis, for it has been considered an established method of dealing with tuberculosis ascites for more than 60 years, when Spencer Wells unwittingly inaugurated the operative treatment of tuberculous ascites, noting the improvement attendant upon the removal of the ascitic fluid which he had mistaken for an ovarian cyst. The late Borchgrevink of Oslo, as early as 1901, however, contended that the conservative treat-

ment of tuberculous ascites was fully as efficacious as the operative with none of the added risks of delayed wound healing or bowel fistula that attend incision.

Tuberculosis of bones and joints, tendon-sheaths, and urinary and genital tuberculosis are still the surgeon's domain, but one of the chief responsibilities of the surgeon who deals with tuberculosis today is the collapse therapy of pulmonary tuberculosis.

This patient undoubtedly presents a contrast equally great in his physical appearance as that manifested in his symptoms and Roentgen findings over that of three years ago and now. As Dr. MacLachlan stated, the patient is now symptomatically well. On the X-ray film made three years ago you will note the presence of an exudative lesion in the upper portion of the right lung with cavity formation. The left lung appears clear. With the institution of pneumothorax an effective compression of the diseased lung has been obtained. There have been no more hemorrhages and the sputum reduced quickly in amount and became negative for microscopic evidence of tubercle bacilli. At present he is also sputum free.

The question arises as to whether pneumothorax should be continued. Packard of Saranac Lake who has given this issue special study believes that the pneumothorax should be continued for at least five years after apparent cure. He found that its discontinuance after that time was not nearly as likely to be followed by recurrence as when interrupted two or three years after symptomatic cure.

Collapse therapy may well be said to be the greatest contribution to the treatment of pulmonary tuberculosis since the institution of systematic bed rest. Without the aid of compression this boy undoubtedly would still have been in bed if still alive. Early effectual obliteration of pulmonary cavities by collapse measures does away with the great hazard of spread into the other lung.

One might also ask should any other adjuvant compression measures be employed here? The phthisiotherapist has at his disposal a number of other therapeutic collapse agents of which phrenectomy and thoracoplasty enjoy the freer indication and wider usage. Thoracoplasty is only indicated in proliferative types of tuberculosis exhibiting evidence of retraction of the mediastinal structures toward the diseased side, and is only to be recommended when pneumothorax is ineffectual. It is to be freely conceded too that a

much better pulmonary collapse is also to be obtained by an effective pneumothorax than by thoracoplasty. Compression by air surrounds the lung and squeezes it as one would a sponge; in thoracoplasty pressure is only exerted upon one side of the lung compressing it against the vertebral gutter. There are those who would have every patient with pulmonary tuberculosis submit to phrenectomy. So effective a collapse has been obtained here, however, as to make such a suggestion superfluous. When inadequate collapse is obtained by pneumothorax, phrenectomy is often a valuable procedure.

It is a good plan I believe if patients have any residual sputum after recovery from tuberculosis, even though it be negative on histological examination, to subject it also to guinea pig inoculation which we know is a much more sensitive test. In the present state of our knowledge of tuberculosis, the problem apart from treating the sick patient is largely a social one, viz., preventing spread of the disease by control of carriers.

#### CASE IV: PROSTATIC ENLARGEMENT (CARCINOMATOUS?)

DR. WOUTAT: The object in presenting this patient is to demonstrate the unfavorable symptoms that may develop as the result of too rapid emptying of the bladder. This patient came in about three weeks ago wearing a rubber bag. He was having only a slight degree of trouble at that time and stated that the trouble began about three years ago with increasing difficulty in urination. His bladder had been emptied before he came in and after three days of drainage I established complete decompression by catheter drainage. He developed a rapid heart, passed urine of low specific gravity and felt ill. Then a clamp was placed on the catheter and he has been improving, but is hardly in condition for prostatectomy.

DR. WANGENSTEEN: The value of preoperative preparation in prostatic surgery is generally appreciated. The question of sudden or gradual decompression has been debated by urologists for a long time. At present, it appears that urologists are withdrawing from the standpoint that sudden and complete evacuation *per se* is dangerous. Many of the symptoms that are attributed to decompression of the bladder may be shown to be due to the infection that accompanies passing of the catheter. Sudden decompression by cystostomy appears to be less serious than complete evacuation of the bladder by the urethral catheter because less danger of infection attends the former procedure. Occasionally hematuria follows sudden emptying of the bladder.

The danger of infecting the urinary tract by catheterization is apparently not as great in the female with the short urethra as it is in the male. Everyone is familiar with the hazards of urinary tract infection in the patient with an injury to his spinal cord, no matter whether the bladder is allowed to overflow, or catheterization is done at eight hour intervals or whether an in-dwelling catheter is employed. If the patient has a good chance for ultimate recovery, I prefer the use of a large in-dwelling catheter in the female, but in the male with a long urethra, I believe his chance of thwarting urinary infection most successfully is through the employment of cystostomy.

In 1930 during the meeting of the British Medical Association, I saw in the Physiological laboratory of the University of Manitoba, in Winnipeg, a dog whose spinal cord had been transected six years before at the level of the sixth dorsal segment. He could not walk; a special cart had been constructed into which the hind portion of his body was placed and with the medium of a harness, walking or running on his two front legs, the dog got around with great facility. The Credé maneuver (as used in extruding the placenta) had been practised until the dog's bladder manifested a certain degree of automaticity and it was still emptied, though less often by this maneuver. The dog appeared quite well and was free from evidence of urinary tract infection.

I believe it is a good plan to do routine preliminary vasectomies in patients being prepared for prostatectomy by urethral catheterization for it does away with the complication of epididymitis. It is a minor operative procedure which renders the patient sterile in that it interrupts the excretory duct of the testis. It does not alter the histology of the testis, however, and interferes in no manner with the sexual function.

J. W. White of Philadelphia, a man who stood at the head of the surgical profession in his day suggested that castration might cure hypertrophy of the prostate. The basis for this suggestion was knowledge of the fact that in animals such as the woodchuck, whose testes are in the retro-peritoneal region during hibernation and in the scrotum during rut, that an enlargement of the prostate gland attended the increase in size of the testes when dependent in the scrotum. This concerns a physiologic process, and in eunuchs castrated before puberty the prostate fails to exhibit the usual development. In prostatic hypertrophy, a pathological process, unfortunately no

reduction in the size of the prostate follows castration.

The only satisfactory manner of dealing with an enlarged prostate is by prostatectomy. It is a safe rule to do a preliminary cystostomy in all poor risk patients before excising the prostate by the suprapubic route. Aside from evaluating the patient generally as a risk it is particularly important to determine the urinary function. The phenol-sulphonphthalein test is a very simple, good, and practical method for estimating the combined kidney function. An excretion of less than 40 per cent within an hour after intravenous injection of the dye indicates an impaired kidney function, and is usually found in patients who have had residual urine and urinary infection for some time. In patients with markedly impaired renal function a prolonged preoperative preparation is in order. One patient came under my observation whose prostate was successfully removed by a two stage prostatectomy whose P.S.P. excretion was zero on repeated tests.

The cause of hypertrophy of the prostate is unknown. The enlargement usually concerns the middle and the two lateral lobes. Zuckerkandl and Tandler state that prostatic hypertrophy is largely due to growth of the periurethral glands at the base of the bladder, into these lobes of the prostate. Enlargement of the lateral lobes of the prostate is best made out by rectal examination. Enlargement of the middle lobe usually results in an intravesical projection that frequently can not be detected by the digital finger. A cystogram or an endoscopic inspection of the bladder will reveal its presence. Bladder neck obstruction without enlargement made out by digital examination may be present and in the absence of an intravesical projection the obstruction is usually due to an atrophic prostatitis or to sclerosis of the internal sphincter.

Benign hypertrophy of the prostate rarely causes symptoms under fifty-five and the majority of the patients beneath that age with prostatic enlargement that have come under my observation have had malignancy of the prostate. Pain in the back or in the perineum in a patient with prostatic hypertrophy is sufficiently suggestive of malignancy to warrant the taking of an X-ray film of the lumbar spine and pelvis to determine whether there is any evidence of metastasis in the bone. The osteoblastic metastases from carcinoma of the prostate are usually so typical that the Roentgenologist suggests the source without any knowledge of the case. The digital finger, however, is the best preoperative criterion as to

whether or not malignancy is present. A firm, inelastic, fixed, and nodular prostate is almost certain to be malignant. The prostate of benign hypertrophy imparts a resilient feel to the palpating finger and the rectal mucosa often feels velvety and can be moved independent of the prostate. When careful and systematic examination of several blocks of excised tissue is made after prostatectomy microscopic evidence of carcinoma is found in about 20 per cent of cases. The prostate in this instance has practically all the typical rectal findings of malignancy.

The results of treatment of carcinoma of the prostate are very unsatisfactory by any mode of treatment. Surgical excision probably cures only those in which the carcinoma is an histological surprise. The results of radium and deep X-ray therapy are disappointing. When the prostate is not fixed, more is to be expected by a radical perineal extirpation than by any other method. When the prostate is fixed, the transurethral or endoscopic removal of prostatic tissue combined with the employment of radium offer most palliation.

The endoscopic method of prostatectomy is best suited for the intravesical projections and for the cases of atrophic prostatitis causing urinary obstruction. Latterly, however, it has been used with considerable success also in lateral lobe hypertrophy and promises to supersede the commonly practiced suprapubic prostatectomy for a large number of cases. Less risk is assumed for the bad risk patient by transurethral prostatectomy than by other operative procedures.

#### CASE V: OSTEOMYELITIS OF THE TIBIA

This boy became ill about a year ago with pain above the ankle, tenderness on pressure and high fever. He consulted his physician a day or two later; a diagnosis of osteomyelitis was made and operation performed. Pus was encountered directly beneath the skin. The wound remained open for some considerable time. There has been no drainage now for some time but there is considerable thickening of the shaft of the tibia in the lower third. There is some limitation of dorsi-flexion in the ankle joint as well as of side to side movement of the foot in the astragalo-calcaneal joint.

Hematogenous osteomyelitis is almost exclusively a disease of the young. About 95 per cent of cases are seen between the eighth and seventeenth years. Only rarely does acute hematogenous osteomyelitis occur for the first time after 25 years. Every now and then a patient of advanced years presents himself with osteomyelitis

insisting that this is his first lesion. Careful inquiry almost invariably brings out the fact that a forgotten difficulty was had with the extremity in his early teens. Hematogenous osteomyelitis attacks with predilection the long bones; only rarely are the flat bones involved or the long bones with short shafts such as the metacarpals or metatarsals or phalanges. About 20 per cent of instances of hematogenous osteomyelitis of long bones occur in the upper extremity and 80 per cent in the lower. That end of the bone which exhibits the greatest growth is most likely to be involved. In the lower extremity therefore, osteomyelitis is most common in the lower end of the femur and the upper end of the tibia; in the upper extremity the greatest growth of bone obtains near the shoulder and wrist joints. Osteomyelitis therefore more commonly affects the upper end of the humerus and the lower end of the radius.

The staphylococcus aureus is the offending agent in the majority of instances; less commonly the streptococcus, pneumococcus, or typhoid bacillus, may be found. The portal of entry for the staphylococcus is not always apparent. Not infrequently it is an acute sore throat, sometimes an antecedent pneumonia or scarlet fever and occasionally a furuncle or infected skin wound.

A bacterial embolus lodges in the terminal ramifications of the nutrient artery and a phlegmon is set up in the medullary cavity. The rigid encasement of the bone precludes any swelling beyond that of the medullary canal of the bone. The only exit for the inflammatory reaction is through the Haversian canals which are endosteum-lined and communicate with the medullary cavity. The exudate then dissects its way out to the surface of the bone, where its accumulation raises the periosteum from the bony cortex. With the presence of a plug in the nutrient artery of the bone and the other source of blood supply, through the adventitious layer of the periosteum from the adjacent muscles, comprised it is little wonder that one frequently sees instances of osteomyelitis with extensive nutritive changes (sequestra formation).

Accompanying every hematogenous osteomyelitis is a transient bacteremia. In those instances in which a persistent bacteremia obtains, multiple pyemic deposits often occur. Many of such cases die. A few years ago at the University Hospital, a boy was admitted with a primary osteomyelitis of the left femur. The pulse and temperature were persistently elevated despite adequate drainage of the initial lesion. Blood cultures

were repeatedly positive for staphylococcus and in rapid succession, practically every other long bone of the four extremities became involved. Following a left mid-thigh amputation the patient's condition rapidly improved and very little difficulty has been had with the other osteomyelitic foci. Unfortunately, however, in multiple osteomyelitis with persistent bacteremia, the outcome is not always so favorable. In about 20 per cent of instances osteomyelitis is multiple.

Embolic pneumonia, acute glomerulonephritis, endocarditis, and meningitis are some of the more serious complications of osteomyelitis and the sequelae that are often the immediate cause of death.

Joint infection is also a much feared complication of osteomyelitis. When the epiphysis of a joint is intracapsular as is the epiphysis at the anatomical neck of the femur, osteomyelitis of the contiguous shaft almost always gives rise to a suppurative arthritis. The usual mechanism for joint involvement is burrowing of pus beneath the periosteum and rupture into the joint through its capsule. The periosteum on a long bone ends where the epiphysis begins and at that point the adventitious layer of the periosteum fuses with the joint capsule. Occasionally, but rarely, the epiphyseal cartilage is penetrated by the infection and presents the portal of entry into the joint. Involvement of the knee joint by a contiguous osteomyelitis from the tibia or femur is particularly serious because of the large extent of serous absorbing surface in the knee joint. Occasionally sympathetic effusions without actual infection are seen, particularly in the shoulder and knee joints.

The diagnosis of typical instances of acute osteomyelitis presents no particular difficulties. The occurrence of excruciating pain near a joint accompanied by chills and pyrexia of marked degree in a youngster is strongly suggestive of acute osteomyelitis. Polymorphonuclear leucocytosis with counts running above 25,000 are not unusual. Extreme tenderness on direct pressure establishes the diagnosis. Redness and edema of the superficial parts obtain only after the lapse of some time and are usually synonymous with the presence of pus beneath the periosteum. When the periosteum is penetrated, the signs of soft tissue abscess formation occur. No support is to be sought in X-ray films for the early recognition of acute osteomyelitis of a long bone, inasmuch as no Roentgen changes are apparent until 10 to 14 days have intervened following the development of the infection. Whereas X-ray films are of great value in the detection of sequestra and the deter-

mination of bone destruction as well as new bone formation in the chronic phase, the X-ray findings may be negative early, even though the shaft be bathed in pus.

Monoarticular rheumatic fever, pyogenic arthritis, a subcutaneous phlegmon and erythema nodosum constitute the usual differential. In osteomyelitis, carefully executed active as well as passive motions can usually be made without pain unless there be a concomitant sympathetic effusion, in contrast to primary joint infections in which movement almost regularly causes pain. In osteomyelitis of the anatomical neck of the femur, tuberculosis of the hip joint must be excluded. Almost every surgeon of experience has seen osteomyelitis in a child treated for fracture, the ununited epiphysis being mistaken, with a confusing associated history of injury, for a fracture.

The treatment of acute osteomyelitis is immediate decompression. No attempt should be made to remove a liberal portion of the cortex over the site of the infection. Extensive cortical removal is accompanied by increased risk to the patient and the end result is no better. A few drill holes should be made into the medullary cavity to facilitate the escape of pus. If a subcutaneous abscess is already present, cortical decompression is of dubious value.

It is difficult in osteomyelitis to speak of cure. It is extremely difficult to eradicate completely diffuse infection from bone. It is not an uncommon experience to see a bone remain healed for a considerable time only to have evidence of infection break out anew. The virulence of the original infection undoubtedly determines in a manner whether subsequent trouble will occur. The atypical mild instances are less likely to be followed by subsequent bouts of fever, pain and suppuration. In the treatment of chronic osteomyelitis, the drainage of abscesses and the removal of sequestra are indicated. Persistent bony cavities should be guttered so that granulations will grow into it. In instances that exhibit periodic attacks of suppuration, in which no demonstrable sequestra or cavities are demonstrable, the decision as to the mode of action is not easy. On the whole, two courses of action are available, one the conservative of treating the condition of the wound locally; the other radical, in which extensive removal of cortex is done in the hope of eradicating the infection. The suggestion of Dr. Orr, of Lincoln, Nebraska, of packing such a wound and immobilizing the extremity in a closed plaster cast appears in the hands of some, to have

given improved remote results over those obtained by the open method.

The truth of the matter is, however, that in a boy such as this it is extremely difficult to be certain that all the ravages of the disease are gone, because the lesion has for some considerable time remained quiescent. The periodic wearing of a pressing when drainage occurs, however, is no great inconvenience. Even in instances where repeated extensive decortications have been done in the hope that the smouldering infection will eventually be put out and exterminated, the patient can not be given complete assurance that he may not now and then have to wear a dressing again.

#### CASE VI: TUBERCULOSIS OF KNEE JOINT

This little girl is said to have been normal until 1931, when she jumped into a basement and injured her leg. The family used home treatment for about a week, and then the patient was brought into a physician's office with some swelling and redness of the limb. A cast was applied. About two months later, following reapplication of the cast, a granuloma formed which broke down and drained. Her temperature varied between 99° and 104° F., for several weeks and then became practically normal. In February, lateral splints were put on the knee. At the time of the Roentgenographic examination a year ago there was no evidence of bone involvement.

This joint presents the typical "white swelling" of tuberculosis. There is slight atrophy of the thigh and calf muscles of the extremity and there is definite limitation of joint motion. The joint is held in slight flexion and there is a definite limp on walking. On this X-ray film definite areas of bone destruction with absorption of cartilage are in evidence; there is a general haziness of the bony architecture due to the decreased density.

The knee joint not being covered by heavy muscles is easy of examination as contrasted with the hip joint. Whereas inspection and palpation are of great value in arriving at a satisfactory opinion in the examination of lesions of superficial joints, such as the knee, in the hip, the indirect method of eliciting limitation of motion, measurements for shortening and displacement are of greater value.

The essence of treatment in tuberculosis of joints is physical and physiological rest. In adults who have attained their full growth, fusion of the adjacent bone ends by operation usually results in a material reduction of the healing period. All the tuberculous disease need not be removed. It is not alone the removal of the tuberculous tissue that obliterates the disease, but the approximation of the adjacent ends of the bones renders the site unfavorable for the persistence of tuberculosis. Predilection of tissue is a significant item in the continuance of tuberculosis. Though the adjacent lymph nodes be destroyed by tuberculosis, the salivary glands are rarely attacked. The extirpation of a tuberculous epididymis usually results in healing of persistent microscopic foci in the testis. Though tuberculosis is observed in shafts of bone occasionally, its most favorable site is the epiphysis. When the surgeon fuses the bone ends, he destroys the joint and the residual tuberculosis disappears.

When the tuberculosis in this knee joint becomes arrested, the joint will be fused, but less interference with growth will attend the conservative plan of management. Better immobilization can undoubtedly be obtained by fixation in plaster than with an ambulatory splint. The treatment so helpful in tuberculosis generally of bed rest, good food, fresh air, and sunshine are not to be neglected.

## The Edema of Kidney and Heart Disease

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*Huron, S. D.*

**A**BOUT thirty-five years ago the physiologist Starling first measured the osmotic pressure of protein solutions and advanced the theory that one of the principal causes of edema is a disturbance of the balance between the osmotic pressure of the blood proteins and the pressure in the capillaries. The clinical significance of this idea was not generally recognized,

but in recent years evidence of its importance has been accumulating. At the present time no one who is treating kidney or heart disease can afford to ignore it.

It has been shown by a number of observers that the proteins of the blood plasma are diminished in concentration in chronic nephritis and nephrosis, the later stage of acute nephritis, and

in most cases of cardiac decompensation. This drop in blood protein may be caused by the loss of albumin through the urine, or by malnutrition. It may be aggravated by protein starvation, the result of a low protein diet. The low blood pro-

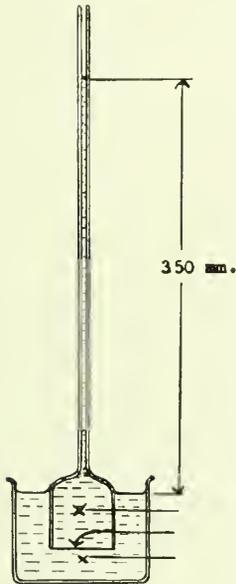


Figure 1

tein has been shown to be directly related to the formation of edema.

Other causes which have been considered as factors in the production of edema are increased capillary permeability, failure of lymphatic drainage, increased tissue affinity for water, and effects of internal secretions, and nervous control.

That the normal capillary is impermeable to protein is shown by the fact that edema fluids in cardiac decomposition and chronic kidney disease are nearly free from protein.<sup>1</sup> However, with any injury, proteins, crystalloids, and water immediately filter through.<sup>2</sup> This explains the edema of inflammation and trauma, and probably also angio neurotic edema.

Lymphatic drainage must carry off a certain amount of edema fluid as it is formed, but it appears to be inadequate to care for the accumulations that occur with excessive filtration into the tissues.

The principal evidence for increased tissue affinity for fluid as a cause of edema is the Aldrich intra dermal salt test. Aldrich found that if normal salt solution is injected intradermally in an edematous area it disappears more rapidly than normal.<sup>3</sup> Krogh suggests that this is merely the result of mechanical factors, greater separation of cells permitting more rapid diffusion<sup>2</sup> and Govaerts found that paraffin oil injected into the skin

acted in the same manner<sup>4</sup>. The old idea that acidosis increased tissue affinity for water does not seem to be compatible with the diuretic action of acidosis producing salts.

The relation of crystalloids, such as salts glucose and urea, to edema is rather complicated. The osmotic pressure of crystalloids is many times greater than that of colloids, but it is relatively unimportant because they diffuse readily through the membranes of the body and the pressure is equalized. Retention of sodium chloride by the kidney frequently occurs in edema. Other salts, such as ammonium chloride<sup>5</sup>, ammonium nitrate<sup>6</sup> and potassium chloride<sup>7</sup> are effective diuretics.

The significance of any nervous regulation of edema formation, and the effects of internal secretions are little understood. It is known that the pituitary can greatly influence the excretion of water, as it does in diabetes insipidus.

We return then to the Starling theory, which we should consider in greater detail. Knowledge of the intimate nature of the so-called osmotic pressure exerted by proteins is far from complete, but the facts which are of interest to us are simple and definite. Suppose that we have a quantity of blood plasma containing say 7 per cent of protein in a bell shaped chamber, as in fig. 1. The bottom of the bell is closed with a membrane of ordinary collodion which is freely permeable to salts and water, but does not allow protein to pass through. The top of the bell connects with a length of capillary glass tubing. If the apparatus is immersed in Ringer's solution, as shown, and allowed to stand for several hours, the liquid in the tube will rise to a height of about 350 m.m. If the tube had been filled to a height greater than 350 m.m. the level would have fallen

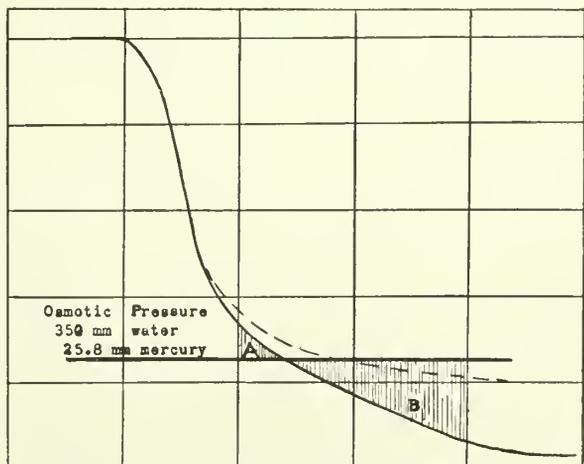


Figure 2

until a point in the neighborhood of 350 m.m. was reached. This point of equilibrium represents the osmotic pressure of the protein. It is nearly proportional to the concentration. The pressure per gram is much greater for albumin than for globulin. Normal blood plasma contains about  $4\frac{1}{4}$  per cent of albumin and  $2\frac{3}{4}$  per cent of globulin. The albumin is lost through the urine more readily and also decreased more rapidly than globulin in malnutrition. Since albumin has a higher osmotic pressure than globulin and fluctuates more, a small change in concentration of total protein may result in a relatively large change in osmotic pressure.

The experiment outlined above finds a close parallel in the human body. The plasma in the apparatus corresponds to the blood in the vascular system, the hydrostatic pressure in the tube, to the capillary blood pressure. The collodion membrane corresponds to and has physical properties similar to the capillary wall. The Ringer's solution in which the apparatus is immersed is similar in composition to the fluid in the tissue spaces. When the capillary blood pressure is greater than the osmotic pressure, fluid filters out from the capillary into the tissue, and tends to produce edema. When the capillary blood pressure is less than the osmotic pressure fluid is absorbed through the capillary wall just as it was absorbed through the collodion membrane in our experiment. In the normal individual these two factors of filtration and absorption balance. That is, fluid filters out from the arterial side of the capillary and is absorbed by the venous side.

This is further illustrated in figure 2. (A similar diagram was used by Christian in a recent article.)<sup>8</sup> The curve represents the mean blood pressure in the arteries, arterioles capillaries and veins. The value for capillaries is that found by Landis from the direct measurements of capillaries of the human skin.<sup>9</sup> The value for venous pressure is that given by Krogh for a portion of the body at the level of the heart.<sup>2</sup> The horizontal line indicates the normal osmotic pressure of blood proteins, 350 m.m. of water or 25.8 m.m. of mercury. The shaded area A represents filtration from the capillaries into the tissue spaces. The shaded space B represents absorption from tissue spaces. It will be seen that if the osmotic pressure, which is dependent on protein concentration, is lowered, filtration will over-balance absorption and edema will result. The dotted line indicates increase in venous pressure and capillary pressure as the result of venous congestion. It

is apparent, as pointed out by Krogh, that any increase in venous pressure must be transmitted back to the capillaries and result in an increased capillary pressure. This will mean increased filtration, and a greater tendency toward edema. If it is associated with a drop in protein concentration the formation of edema will be greatly accelerated.

Direct evidence of the operation of these factors is furnished by several lines of work. Leiter<sup>10</sup> and Barker & Kirk<sup>11</sup> produced edema experimentally in dogs by bleeding them repeatedly and reinjecting the washed corpuscles. This lowered the blood proteins without producing anemia, and edema developed. Landis<sup>12</sup> reports a case of inanition edema with low blood protein in a patient with normal heart and kidneys. The patient had been on a very low protein diet for the treatment of an intestinal tuberculosis. When given a normal diet the blood protein rapidly increased and the edema disappeared. Krogh, Landis and Turner<sup>13</sup> found that edema began to develop in the forearm when the venous pressure was raised to 15 c.m. of water with a blood pressure cuff, and they measured its rate of formation. Further, they produced a temporary rise in the concentration of the blood by having the subject stand quietly for two hours. Enough fluid filtered from the blood into the tissue spaces of the legs to raise the blood protein from 7.6 per cent to 8.5 per cent. This produced a definite drop in the rate at which edema would form in the arm.

The practical importance of all of the foregoing is simply this—in addition to the usual methods of treatment of edema, such as rest, regulation of fluid intake, restriction of salt, diuretics, and digitalis, we must concern ourselves with the nutrition of the patient. Particularly in the prevention and treatment of cardiac decomposition this introduces an idea that may be new to many. Payne and Peters<sup>14</sup> found serum protein reduced in the majority of patients with decompensation, and found definite evidence of malnutrition associated with the lowered protein.

Diets must be adequate in every way, and every effort should be made to maintain nutrition, even in the presence of nausea and vomiting. Authorities disagree on the exact amount of protein necessary, but it seems safe to say that an adult should not be kept on a diet of less than sixty grams of protein per day for any length of time. Milk can be used, but it will have to be supplemented with other protein foods, as a liter of milk will contain only 30 grams of protein. Its sodium chloride content is too small to be of significance as a con-

tra indication. If large amounts of protein are being lost in the urine it is well to determine the amount in a twenty-four hour specimen and take this into consideration when prescribing the diet. Whenever possible the percentage of albumin and globulin in the blood should be determined, and followed during the course of the disease. We have found the method of Greenberg<sup>15</sup> to be satisfactory. It requires no special apparatus, and can be done in any laboratory equipped for blood chemistry.

In cases of nephritis with excessive urea retention one would restrict protein even at the risk of making the edema worse.

The edema of acute nephritis requires special consideration. In the early stages it cannot be explained on the basis of lowered blood protein, as cases have been reported by Peters<sup>16</sup> and several others, in which the proteins were within normal limits. There are two possible explanations, the first an increase in capillary permeability producing an edema analogous to that of acute inflammation. The second and more probable possibility is that there is an increase in capillary pressure associated with the increase in arterial pressure, which would cause increased filtration. As the disease progresses the blood proteins decrease to a point where they would account for the edema. For this reason the diet should be kept as high in protein as is consistent with the patient's ability to take food and the amount of urea retention.

## SUMMARY

1. The principal cause of the edema of the kidney and heart disease is a disturbance of the balance between the osmotic pressure of the plasma proteins and the pressure in the capillaries.

2. In addition to the generally accepted methods of treatment every effort should be made to maintain or increase the level of the blood proteins by an adequate diet.

3. Diet is important in the prevention of cardiac decompensation.

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## Result of Collapse Therapy in an Indian Sanatorium\*

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**C**OLLAPSE therapy as a measure in the treatment of tuberculosis has not become as uniformly applied in the Indian as has been the case in the care of his White neighbor. So far as we have been able, all cases coming to the Onigum Sanatorium during the past three and one-half years have been given collapse therapy when indicated, and where consent could be secured. In no instance was the Doctor's recommendation over-ruled by anxious parents or relatives.

Pneumothorax was begun March 24, 1928. Since this time there has been 42 cases admitted to the Sanatorium where collapse therapy was attempted. The Onigum Sanatorium admits all cases of tuberculosis. During the period under consideration, March 1, 1929 to June 11, 1932, 21 bone, 92 cervical adenitis, and 189 cases with pulmonary tuberculosis were admitted. Of these 189 cases of pulmonary tuberculosis, 42 were found to have unilateral disease and cases which might be expected to respond favorably as a result of collapse therapy.

\*Presented before the Minnesota Trudeau Medical Society, July 9, 1932, at the Minnesota State Sanatorium, Ah-Gwah-Ching, Minn.

CASES ADMITTED FROM MARCH 1, 1929, TO JUNE 11, 1932

	Bone	Gland	Pul. Tbc.	—Sputum—		Full Blood	Mixed Blood	Disch. With Medical Consent	Disch. Against Medical Advice	Died	Total Adm.
				Pos.	Neg.						
0-4	0	2	2	0	0	1	3	0	1	1	4
5-9	4	18	14	5	29	9	27	15	11	2	36
10-14	4	28	31	18	45	20	43	23	21	4	63
15-19	5	22	35	26	36	29	33	34	18	5	62
20-24	1	11	22	15	19	14	20	15	12	3	34
25-29	0	5	20	15	11	9	16	10	5	5	25
30-34	1	2	15	11	7	8	10	5	6	3	18
35-39	3	0	13	7	9	6	10	8	5	1	16
40-44	1	0	12	3	10	5	8	4	6	0	13
45-49	0	2	7	4	5	2	7	4	4	1	9
50-54	0	2	4	3	3	4	2	2	1	3	6
55-59	0	0	2	1	1	1	1	1	0	1	2
60-64	1	0	2	1	2	1	2	2	1	0	3
65-69	1	0	5	4	2	4	2	1	2	1	6
70-	0	0	5	4	1	5	0	2	2	1	5
Total	21	92	189	117	180	118	184	126	95	31	302

Of the 302 patients admitted during this period, 252 were discharged, 95 left against medical advice, 126 left with the Doctor's approval and 31 died.

Of the 42 cases given collapse therapy, 12 were full-blood and 30 mixed-blood, ranging in age from 17 months to 70 years.

limitation of the disease to one lung over a considerable period of time, and collapse therapy was advised, however, it was only continued a month and abandoned.

The fourth death was in a man 60 years old who was toxic at the time collapse therapy was initiated and did not respond as the family expected. He was allowed to go home soon afterwards.

In one instance the family removed a child soon after collapse therapy was begun since they could not go ricing without the entire family being present. The child was removed at a critical time, and all the beneficial effects of the collapse were soon lost.

In an 11 year old girl the last of her immediate family, the Grandmother took the child and visited from one neighbor to another as they had no fixed abode, until the patient died without medical care. Three months later the Grandmother was found to have far advanced pulmonary tuberculosis and after four months in the Sanatorium left against medical advice, living again from one neighbor to another until she finally died. Through these two periods the Field Nurses and the Doctor were unable to trace and find the individuals concerned. The girl was a very hopeful case for recovery under proper medical care. The Grandmother was a far-advanced case, who through her visiting, exposed many others to tuberculosis before she finally died from it.

Still another case was removed after collapse therapy had been successfully established and the patient began to make a satisfactory convalescence. This boy was placed in the care of an Indian Medicine Man, who promptly put him on a strenuous regime of exercise. He was made to run at least one-half mile a day with a temperature frequently above 100°. His toxemia increased rapidly and he died within a few weeks following.

The remaining deaths occurred in cases where

Age	—MALE—		—FEMALE—		Total
	Full Blood	Mixed Blood	Full Blood	Mixed Blood	
17 Months	0	1	0	0	1
5 Years	0	0	0	1	1
6 Years	0	0	0	1	1
8 Years	0	0	1	0	1
9 Years	0	0	0	2	2
10 Years	0	0	1	0	1
11 Years	0	0	0	1	1
12 Years	0	1	0	1	2
13 Years	0	1	0	0	1
14 Years	0	1	1	2	4
15 Years	0	1	1	1	3
16 Years	0	2	1	1	4
17 Years	1	0	0	0	1
18 Years	0	1	0	1	2
19 Years	0	2	0	0	2
20 Years	0	1	1	0	2
21 Years	0	1	0	0	1
22 Years	1	0	1	1	3
23 Years	1	0	0	1	2
26 Years	0	0	0	1	1
28 Years	0	0	0	1	1
36 Years	0	1	0	0	1
38 Years	0	0	1	1	2
60 Years	0	1	0	0	1
70 Years	1	0	0	0	1
Total	4	14	8	16	42

18 of the patients given pneumothorax have died, of these 4 were full-blood and 14 mixed-blood. In 4 of the 42 cases pneumothorax was unsuccessful due to the fact that air could not be introduced into the pleural space. One of these cases died soon after pneumothorax was attempted.

One death occurred in a fourteen year old girl who developed an extensive lesion in the functioning lung, the patient dying in a hemorrhage.

The third death occurred in a twelve year old girl, who had had tuberculosis from infancy. Suffering at various times from Potts disease, tuberculosis of the hip, and adenitis bilateral and draining. The final and terminal disease was a basal tuberculosis. This patient showed marked

we had been able to establish a successful collapse and whose convalescence under ordinary conditions would be expected to continue uneventful. They, however, left against medical advice and rapidly developed extensions from which they were unable to recover.

The 24 cases now living, 13 were discharged against medical advice, 6 remain in the Sanatorium on collapse therapy and 5 remain in the Sanatorium in whom collapse therapy has been discontinued.

Time on Collapse Therapy	Now in San. on Collapse Therapy	Now in San. Collapse Therapy Discontinued	Discharged Against Medical Advice	Died in San.	Died at Home	Total
1 Month or Less	1	0	3	1	1	6
1 to 3 Months..	0	0	3	7	4	14
4 to 6 Months..	1	0	4	2	1	8
7 Months to 1 Year .....	3	3	3	0	2	11
1 Year and Over	1	2	0	0	0	3
Total .....	6	5	13	10	8	42

In 37 of the 38 cases where pneumothorax was successfully established positive sputum was reported before pneumothorax was begun. Among these cases 3 became negative after 3 months, 2 after four months, 1 after 5 months, and 1 after six months. No record is available concerning the subsequent sputum of those cases on pneumothorax who left the institution against medical advice.

We feel that collapse therapy is as practical in the treatment of tuberculosis among the Indian as it is with the White population. Failures are due to the lack of proper facilities for care and follow-up. Obliteration of the pleural space occurs about as frequently in the Indian as among other races. Adhesions holding out areas of the involved lung tissue and cavities occur in much the same way as they do in individuals of other races. The only variation from the usual so far as the Indian is concerned is possibly the greater number of adolescent youth affected with extensive lesions.

Twenty-two of the cases collapsed occurred in individuals sixteen years of age or younger. Ten cases occurred in children from five to thirteen years of age. During the period in

which this work was carried on forty-five patients belonging to this age group were admitted to the Sanatorium with pulmonary tuberculosis. It is our experience that these patients have been living in homes with open cases of tuberculosis under the most unhygienic surroundings, favorable for the continued inhalation of massive doses of tubercle bacilli. The question in these early cases of breakdown arises as to the necessity of a transfer and the duration of the transfer following the primary complex and the development of parenchymal disease and clinical breakdown. From our limited experience and observation we feel that while there are the two phases in the development of parenchymal disease that they may develop very close together, if not even the primary phase overlapping the beginning of the parenchymal disease.

The attitude of the Indian is at considerable variance with that of the White. He is not greatly interested in his environment and investigations do not often carry him into the medical field, for this reason he does not develop a class of individuals who presume much and prove little.

The Indian is anxious to stay well if he is so fortunate, and to get well if he is ill. He is always cooperative and appreciative. He respects sincerity and the efforts expended on the part of the Doctor to give him relief.

It is our opinion that based upon considerable observation of the Indian over many years that his tuberculosis is as controllable as is the disease among any other race. That while racial susceptibility may be a factor for consideration at some future time it is a minor element contributing at this time to the present tremendous death rate from tuberculosis among this group of our population.

The problem which challenges the physician is the sterilization of sputum, regardless of whether it is the White Man's sputum or the Indian's thus breaking the route of infection as a result of sterilization.

Pneumothorax has succeeded in accomplishing two important results, the sterilization of sputum of many cases and the elimination of a carrier state.



# An Analysis of Certain Clinicopathologic Features of Diseases of the Appendix\*

*With Special Reference to Appendiceal Obstruction in the Etiology of Appendicitis*

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**T**HIS report is based on the 263 consecutive cases of appendiceal disease occurring in the clinic practice during 1929. In three cases of appendicitis complicated by peritonitis the appendix was not removed, so that 260 appendices were available for study. In addition 82 appendices were removed incidental to other abdominal operations. They are used as a control series.

The cases are distributed according to the following clinicopathologic diagnoses:

	Cases	Per Cent
Acute appendicitis .....	81	30.8
Acute appendicitis with complications requiring drainage (46 appendices).....	49	18.6
Mild acute appendicitis (subacute).....	29	11.0
Mild recurrent acute appendicitis (chronic).....	101	38.4
Tuberculous appendicitis .....	2	0.8
Carcinoid of the appendix.....	1	0.4
	263 cases	100.0
	260 appendices	

The age distribution of the 260 cases of appendicitis (the two cases of tuberculous appendicitis and one case of carcinoid of the appendix are excluded) ranges from two years to 67 years, with the median age at 19 years. Forty-four and two-tenths per cent (116 cases) of all cases (260) are in the second decade of life, and 55.6 per cent (45 cases) of 81 acute appendicitis cases occur in this age group; but only 36.1 per cent (17 cases) of 49 acute cases with complications (cases requiring drainage) occur in the second decade. The sex distribution is about equal for the entire series, 47.3 per cent (123 cases) being males and 52.7 per cent (137 cases) being females. However, among the mild recurrent acute cases 60.4 per cent (61 cases) are females; and among the acute cases with complications 69.4 per cent (34 cases) are males.

A record of the residence of the patients (farm or town) was available in 219 cases. Of these a majority, 59.8 per cent (131 cases) lived on farms; the others, 40.2 per cent, in Minot and neighboring small towns. During the same period (1929) 2,221 patients were registered at the

same hospital (Trinity) for treatment for other ailments than appendicitis; and of these a majority, 56.9 per cent, were town dwellers, whereas a minority, 43.1 per cent (59.8 per cent for the appendicitis series) lived on farms. This difference of 16.7 per cent is a significant one when tested by the Chi-square formula (Pearson<sup>1</sup>) for measuring the reliability of such data.

There are no marked seasonal variations in the incidence of appendicitis in this series. Cases are quite evenly scattered throughout the year, with the greatest relative incidence, 28.5 per cent, occurring in the summer months.

In obtaining the history of each case a careful inquiry and record of the frequency of attacks was made. Multiple (2 or more) attacks are present in 67.3 per cent (173 cases) of all cases (257 appendices), 100 per cent of mild recurrent acute cases, 73.7 per cent (57 cases) of acute cases without complications, but in only 32.6 per cent (15 cases) of acute cases with complications. Of 14 acute cases without complications with evidence of appendiceal obstruction (as defined below), 13 have had multiple attacks; while of 17 acute cases with complications requiring drainage with appendiceal obstruction, only two have had multiple attacks.

The mean number of white blood cells in a cubic millimeter of capillary blood for the 81 acute appendicitis cases is 15,400, for the 81 mild acute cases, 10,800, for the 101 mild recurrent acute cases (some in quiescent phase) 8,400, and for the 49 acute cases with complications 18,400, with a range variation from 5,000 to 49,600 for the entire series.

In two cases of acute suppurative appendicitis and one case of gangrenous appendicitis, repeated white blood cell counts did not reveal an abnormal number; but operation was indicated by the history and physical findings (localized right lower quadrant pain, tenderness, muscle spasm, etc.), and was fully justified by the findings.

Traces of albumin in the urine are recorded

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present in 21.2 per cent of acute cases, 6.9 per cent of mild acute cases, 10.0 per cent of mild recurrent acute cases and 40.8 per cent of acute cases with complications. A few red blood cells in the urine are recorded present in one case of acute appendicitis, but none were found in post-operative specimens. Chronic pyelonephritis with pyuria was an associated condition in two cases.

The description of the appendix recorded all gross changes with particular regard to:

- (1) Evidence of obstruction of the appendix lumen by:
  - (a) fecal impactions (fecal concretion, fecalith, fecal mass);
  - (b) scarring associated with partial or complete occlusion;
  - (c) kinking and adhesions causing abnormal position and fixation of the appendix associated with partial or complete occlusion;
  - (d) foreign body.
- (2) Evidence of inflammation with reference to:
  - (a) location (mucosal, mural, serosal);
  - (b) degree (mild, marked);
  - (c) character (catarrhal, diffuse, suppurative);
  - (d) relation of appendiceal obstruction when present.
- (3) Evidence of gangrenous necrosis.
- (4) Evidence of perforation.

Extension of the inflammatory process to peri-appendiceal tissues was also recorded.

Histologic examination of the appendix was made in most instances and was helpful in classifying some specimens, but these findings will not be reported in detail.

Bacteriological examinations in a few cases have added nothing of interest and are excluded.

The appendix was said to be obstructed when it seemed evident from the location and character of material (fecal, foreign body) within the appendix or constriction of its wall that secretions (normal or pathologic) could not be readily expelled by appendiceal peristalsis.

Opinion varies as to what constitutes a true dynamic (mechanical) obstruction of the appendix. In this study particular care was taken to classify in this group only such appendices as were obviously obstructed. Appendices containing soft fecal material which could be readily expressed, and ones showing minor scarring or kinking with a patent lumen and no evidence of a damming back of secretions were therefore listed as non-obstructed specimens.

It is obviously true that the condition of the appendiceal lumen at and near its juncture with the cecum in the region of the "valve of Gerlach" cannot be accurately known since this portion remains (not removed) after appendectomy, and cannot therefore be tested for patency as can the rest of the appendix. Fecal impactions at this point are not infrequently seen, and serve to emphasize its relative importance. It may be that obstructions from other causes (valvular, stricture, angulation with occlusion, etc.) may escape detection. The fact that examination of necropsy and cadaver specimens rarely demonstrates occlusion of the lumen at this point may be accounted for by the possibility that all such specimens have been previously removed on account of appendicitis.

According to the above definition, appendiceal obstruction is present in 77 cases representing 29.9 per cent of 257 appendices studied, and is due to some form of fecal impaction in 52 instances or 20.2 per cent of the entire series, and 67.5 per cent of the 77 cases of appendiceal obstruction. Scarring with and without kinking is seen in 31.2 per cent (24 cases) and foreign body (muskmelon seed) in 1.3 per cent (1 case).

Appendiceal obstruction is most often seen in this series among mild recurrent acute appendicitis cases occurring in 41 cases (41.58 per cent of 101 cases), of which in 21 cases the obstruction was caused by fecal impactions. Thirty-seven per cent (17 cases) of 46 cases of acute appendicitis with complications show appendiceal obstruction, which is due to fecal impaction in 16 instances, and scarring in one instance; whereas, in acute cases without complications, obstruction is seen in 17.3 per cent (14 cases) of 81 cases, and is due to fecal impaction in 12 cases, muskmelon seed and fecal concretions in one case and scarring in one case.

The relationship of appendiceal obstruction to multiplicity of attacks has been previously stated.

Appendices of the control series of 82 specimens were removed from patients who were operated upon for non-appendiceal abdominal lesions, and who had had no symptoms or signs referring to the appendix. These show evidence of obstruction in nine instances, 11 per cent, which is due to fecal impactions in four cases and scarring in five cases.

Obviously this series does not afford a perfect control for the appendicitis series, since it is smaller, and the age and sex distributions differ. The median age is 35.5 years, with a majority of the patients in their fourth and fifth decades of

life; and 62 per cent were females. It is probable that a perfect control series from the second and third decades of life would show a higher incidence of fecal impactions, if not of scarring, than is seen in this group.

This series does emphasize, however, the variations seen in the appendicitis series; i. e., 17.3 per cent of cases of acute appendicitis without complications, 37.0 per cent of cases with complications and 41.0 per cent of mild recurrent acute appendicitis cases had evidence of appendiceal obstruction.

The location, degree, and character of the inflammatory process apparently are not greatly influenced by the presence of appendiceal obstruction. Catarrhal, diffuse and suppurative inflammation are seen with about equal relative frequency among non-obstructed and obstructed appendices. Contrary to what might be expected, gangrenous necrosis is more commonly seen in non-obstructed specimens, 19.4 per cent (13 cases) of 67 cases as compared with 6.1 per cent (1 case) of 14 obstructed specimens among the 81 acute cases not requiring drainage. Among the 49 cases requiring drainage, gangrenous necrosis is seen as frequently in obstructed as non-obstructed specimens.

Perforation is observed in 58.8 per cent (10 cases) of 17 obstructed specimens among the 46 cases requiring drainage, and in 48.3 per cent (14 cases) of 29 non-obstructed appendices in the same group.

Localized peri-appendicular peritonitis is present in 23 cases, 46.9 per cent, of 49 cases requiring drainage. Definite abscess formation in the right flank region is seen in 24 cases (48.9 per cent), in the pelvis in two cases (4.2 per cent), and throughout the abdomen, multiple in one case.

Secondary complications occurring during hospital convalescence numbered 34 in 30 cases, including nine upper respiratory infections, eight instances of paralytic ileus of various degrees, four cases with secondary wound hemorrhage, and 13 others of lesser importance.

Seven complications contribute to the cause of death in four cases. Generalized peritonitis and adynamic (paralytic) ileus are the immediate causes of death in three cases, a four-year-old girl, a 62-year-old man, and a 62-year-old woman. Localized peritonitis, adynamic ileus and pulmonary edema caused the death of a 54-year-old man. No deaths occurred among patients in the second, third, fourth and fifth decades of life, which includes 226 (86.9 per cent) of 260 patients.

The hospital mortality for the entire series of 260 cases is 1.5 per cent (4 cases), and for the 49 cases requiring drainage is 8.2 per cent (4 cases).

Three of the four fatal cases were operated upon through a right lower rectus incision and drainage was established with penrose and tube drains. This method was employed in a total of 29 cases with three deaths, a mortality of 10.4 per cent. The Mickulicz-Gibson method of drainage through a McBurney incision was used in 20 cases, with one death, a mortality of 5.0 per cent.

Tuberculosis of the appendix secondary to tuberculous peritonitis occurs in two patients, with recovery in both instances.

Carcinoid of the appendix is seen once in this series. It occurs in the case of an otherwise healthy 18-year-old girl, who had had several attacks of mild right lower quadrant pain, often accompanied by slight nausea, for one year, attacks which never incapacitated her and usually subsided in two or three days. She was operated on during a quiescent period when no leucocytosis or fever was evident. The distal one-fourth of the appendix was replaced by a firm, rounded tumor which proved to be a carcinoid.

Partial obliteration of the lumen of the appendix with beginning atrophy is seen in 27 cases, 7.8 per cent of 340 specimens. Complete obliteration and marked atrophy occur in 17 cases, 4.9 per cent, 14 of which are from the control series.

The one case of foreign body in the appendix is interesting and serves to illustrate the importance of appendiceal obstruction. It occurs in the case of a 19-year-old student nurse who had been ill twelve hours with severe colicky mid-abdominal pain, which had gradually shifted to the right lower quadrant, and was accompanied by nausea and vomiting. There was marked superficial hyperesthesia, tenderness and muscle spasm in the right flank. *Choc en retour* was referred to the same region. Two months previously the patient had had a similar attack in which the pain subsided in eight hours, but soreness persisted for three days. The appendix was found to be acutely inflamed and distended with pus, and its lumen in the proximal one-third was completely obstructed by a fecal concretion and a muskmelon seed. Perforation had not occurred, but gangrenous necrosis of the mucous membrane distal to the obstruction was evident at several points. The serosal surface was inflamed, and showed evidence of impaired circulation and early gangrenous necrosis. On inquiry it was learned that before the first attack, the patient was on duty in

a special diet kitchen where she had eaten muskmelon several times.

In this case, the etiology of the appendicitis seems clearly established. The favorable termination of the first attack may be explained by assuming that the obstruction caused by the muskmelon seed or fecalith was relieved, and natural drainage of the appendix into the cecum established. In the second attack, the seed and concretion apparently became too firmly impacted for spontaneous relief to occur through peristaltic action of the appendix; and necrosis of the mucous membrane secondary to increased intra-appendiceal pressure provided a good medium for anaerobic or other bacteria to multiply, and supuration was the natural result. Perforation would doubtless have occurred in a few hours had not the appendix been removed.

It seems likely that obstruction by fecal concretion alone may occur in the same manner, precipitating appendiceal colic, and, if not relieved spontaneously or by appendectomy, finally result in gangrenous necrosis, suppuration and perforation. Slight degrees of impaction may explain some of the mild recurrent acute (chronic) attacks. It is difficult to believe that the high incidence of obstructive lesions in this series is a chance one, and has no relation to the etiology of the disease.

According to Fitz,<sup>2</sup> Goldback<sup>3</sup> (1830) was the first to suggest that fecal retention in the appendix might cause peri-typhilitis and peritonitis. He reported such a case in his graduation thesis. In 1847 Matterstock<sup>4</sup> reported 169 necropsy cases of fatal perforating appendicitis, 53 per cent of which were associated with fecal concretions and 12 per cent with foreign bodies.

Reginald Fitz<sup>2</sup> stated in 1886 that the etiological importance of the presence of fecal masses and foreign bodies in the appendix is well recognized, and reported 152 cases, among which 47 per cent of appendices contained fecal masses and 12 per cent foreign bodies. He also noted that 28, 11 per cent, of 257 cases had had two or more attacks.

Aschoff,<sup>5</sup> however, in 1905, wrote that fecaliths are normally present in the appendix in as high as 62 per cent of individuals and are no menace to health.

Bayard Holmes<sup>6</sup> believed that all cases of appendicitis begin as simple retention cysts produced by obstruction at the valve of Gerlach. He suggests that in some individuals the valve may be abnormally constructed and allow fecal matter to enter the appendix and at the same time

prevent its exit. Abnormal position of the appendix causing torsion and kinking, and over distention of the appendix with fecal matter as a result of coughing, straining, trauma, etc., might lead to obstruction at the valve of Gerlach.

Van Zwalenburg<sup>7</sup> in 1904 reported the results of experiments on dogs in which he produced artificial obstruction of the appendix by sub-peritoneal ligature at its base. The appendix was then distended with sterile water, and the ligature left in place for two or three hours. By these means he was able to produce in 24 to 48 hours all of the characteristic changes of appendicitis as seen in man. Again 1907<sup>8</sup> and 1932<sup>9</sup>, on the basis of further experimental and clinical observations, he reiterated his belief that appendicitis is primarily caused by strangulation or obstruction, which results in distention of the appendix with an increase in hydraulic pressure of the secretions within its lumen. The increased pressure leads to impairment of blood supply to the mucous membrane and necrosis with consequent infection ensues.

His work has been confirmed by Heile,<sup>10</sup> who made the additional observations that the degree and rapidity of the reaction varied directly with the amount of fecal material in the appendix, and that the alkalinity of the fecal material favored necrosis of the lymphoid tissue in the appendix.

Wilkie<sup>11</sup> studied this problem by isolating a small loop of intestine in the dog and constructing from it an artificial appendix closed at both ends. He showed that more rapid destruction in the isolated loop occurred in dogs which had been fed on a rich protein diet prior to operation than in dogs fed on a carbohydrate diet.

Wilkie was the first to attempt the differential diagnosis of acute appendicular obstruction and acute appendicitis. He thought that this was possible because in his experience acute appendicular obstruction gives rise to colicky mid-abdominal pain and tenderness, associated with vomiting, but at the onset no appreciable rise in pulse and temperature. Appendicitis, on the other hand, causes an early rise of temperature and pulse rate.

In his experience the common causes of obstruction are:

- (1) Fibrous stenosis of the appendix with plugging of the constriction by fecalith, foreign body, etc.;
- (2) Acute kinking of the appendix at a point of abnormal fixation by a congenital or acquired band or fold.

## SUMMARY

This analysis of 263 consecutive cases of appendiceal disease indicates that in Minot and its vicinity:

Appendicitis occurs most frequently among individuals in the second decade of life. Late adolescent and young adult persons are particularly susceptible to this disease, but they do not develop complications relatively as frequently as children and middle aged adults.

More complications occur among male than female patients. Mild recurrent acute appendicitis (chronic) is most common among female patients. The sex incidence otherwise and for the entire series is quite evenly divided.

There is considerable evidence that farm dwellers in this district are more subject to appendicitis than towns-people.

A large majority of patients have had multiple attacks. Complications are most common among patients in their first attack.

Three cases of acute appendicitis with normal white blood cell counts emphasize the fallacy of placing too much reliance on this test alone.

Appendiceal obstruction due to fecal concretions, scarring and kinking occurs frequently and appears to be an important etiological factor in acute appendicitis and mild recurrent acute appendicitis.

Localized peritonitis and abscess formation occur as frequently without gross perforation of the appendix as in its presence. Roughly one-half of cases requiring drainage have a well defined abscess by the time of operation.

Peritonitis and adynamic ileus are the immediate causes of death in four cases (1.5 per cent). These were individuals in the first, sixth and seventh decades of life. No deaths occurred among patients in the second, third, fourth and fifth decades.

A higher mortality occurred among cases drained through a right lower rectus incision than among cases drained by the Mickulicz-Gibson method through a McBurney incision.

Tuberculosis, carcinoid and other tumors, and foreign body of the appendix are not often seen in this locality.

The writer desires to express his thanks to Dr. A. L. Cameron and Dr. A. R. Sorenson for their helpful co-operation in this study.

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## The Prevention of Tuberculosis\*

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**A**LONG with the gradually increasing recognition of the importance of health, there has grown up voluntary and official public health agencies part of whose purpose it is to accumulate from the medical profession and elsewhere information regarding health conditions. The data they assemble consists, among other things, of the occurrence of birth, deaths, and certain important disease. As a result of the accumulation and tabulation of this information we are given a fairly accurate picture of our various health problems.

Thus, we see tuberculosis presenting our most

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important national health problem, at least from the economic standpoint. Its great economic importance is due largely to the fact that it is a chronic disease usually of months or years duration, and that it attacks chiefly those of the active age groups—namely, children and the younger adults. Tuberculosis is not the chief cause of death. Heart disease, kidney disease, and pneumonia surpass it as causes of death, but these latter diseases rank as high as they do partly because they are so frequently the cause of death in old people.

Why should tuberculosis continue to be such a dangerous and widespread disease, when we have

known for fifty years the cause of it, when we have learned during the past two or three decades so much about its successful treatment, and when we know much about its prevention? The chief reason why this is so is that relatively little has been accomplished along the line of prevention. Much so-called educational work has been done and much literature concerning prevention has been distributed but most of these efforts have produced only superficial results, in that they rarely reach in an effective way those who need educating. For prevention to be effective, in my opinion, it is necessary to come in actual contact with the individual in whom tuberculosis is to be prevented and demonstrate to him how prevention can be carried out. A great majority of people who need educating about tuberculosis prevention belong to the group who can be impressed only by demonstration. They have to be shown. An attempt will be made then, in this discussion, to emphasize what has been found to be practical methods of prevention.

There has been a marked reduction in the death rate from tuberculosis and the rate continues to fall gradually. While this is encouraging we should not get too much contentment out of it for the reason that the death rate does not give a true index of the whole situation. Because of earlier diagnosis and better treatment, certainly fewer people are dying of tuberculosis, but there is strong doubt as to whether or not there has been any definite or marked reduction in the incidence of the disease. And, it is the disease, with its chronicity, its incapacitation of those affected, and the incidental prolonged need of money, beds, and the time of all who care for the tuberculous sick, that represents the great burden of the tuberculosis problem. Treatment is important and necessary, but prevention is fundamentally essential to the solution of the problem, and to the extent that prevention is accomplished, soon the burden presented by the tuberculous sick will disappear and deaths will cease.

In considering the prevention of tuberculosis one must never forget bovine tuberculosis as a source of infection in human beings. Important steps, such as the tuberculin testing of cows and the pasteurization of milk, have been taken to eliminate this source of infection. Great success has attended these efforts, but there is still room for a wider extension of this work and probably for improvement in methods. However, for the sake of emphasis, let us put aside bovine tuberculosis as a source of human infection, and say that all new tuberculosis develops from the indi-

vidual who already has tuberculosis and is giving off tubercle bacilli in one way or another. If he could be eliminated as a source of spread of infection soon the tuberculosis problem would be solved.

How can we approach this ideal and what are some of the difficulties? In the first place, if we could so treat those we diagnose that they would no longer be sources of danger to others, that would be one important forward step in prevention. This can be done and is being done in many instances. The better sanatorium has been our greatest isolation and education center in this regard. However, the same thing can be accomplished in many of the homes. The amount of success in this connection depends largely upon the training, upon the ability to secure co-operation, and upon the zeal of the physician in charge.

But, even if we eliminate as sources of spread those we diagnose and treat, still we have gone only part of the way, for the reason that there are numerous individuals who have tuberculosis who have never been diagnosed; and those we do diagnose come to us often only after they have spread infection to many others, especially members of their own families. It is clear, then, if treatment is to be an efficient means of prevention, much more of the existing tuberculosis must be found, diagnosed, and treated; and, not only that, but it must be found early. Means directed toward accomplishing this will be discussed later. Some of the inherent difficulties which stand in the way of early diagnosis and successful treatment will be mentioned first.

An obstacle to early diagnosis is that tuberculosis is usually so gradual in its onset, usually does not incapacitate early, usually does not make the individual feel particularly sick, and simulates other less dangerous conditions so closely, that there is little tendency for the patient to apply early for medical advice. If the early symptoms were more often pleurisy or hemorrhage which respectively cause pain and frighten, there would be less of a problem in this regard. However, frequently one hears such expressions as, "it's another cold," "it's bronchitis," "it's a cigarette cough," "I've had that tired feeling before and got over it," "have been working too hard, and I need a vacation," and so forth. Then, too, there are here in Tennessee, those with old chronic fibroid tuberculosis many of whom are past fifty or sixty years of age, have had open disease ten or twenty years, called chronic bronchitis, who, because there is little actual incapac-

tation at their age, never present themselves for medical examination.

In the case of treatment, the patient rarely feels as sick as he is, and for that reason it is difficult to get him to co-operate to the extent that it is necessary for good treatment. And, from the standpoint of prevention of spread, the patient usually does not present an alarming enough picture to others to make the avoidance of contact with him seem important.

Another difficulty that stands in the way of early diagnosis and good treatment, is that neither of these is easy. Both require on the part of the physician not only training, but also definite interest in tuberculosis. If we, as physicians, are not interested or are not trained to do the work, we should, when necessary, use other physicians who are, until our interest is established and our training is improved. There is nothing more demoralizing to the whole problem of tuberculosis control than for us physicians not to measure up to what is required of us. This does not mean that one has to be a tuberculosis specialist to take part in tuberculosis work, nor does it mean that every one has to concern himself with tuberculosis, just as some do not do surgery, but it is pathetic to see a patient with moderately advanced or advanced tuberculosis who says that earlier in his disease he saw his doctor and was told that there was nothing wrong. The X-ray is an important aid in diagnosis and should never be omitted as part of the examination, for the reason that one nearly always sees more in the X-ray, in the case of pulmonary tuberculosis, than one expects to see after having listened to the chest.

Emphasis has been placed on the importance of careful diagnosis made as early as possible, and good treatment, because, aside from the fact that they are so essential to good results in the care of the tuberculous sick, they play such a prominent role in the prevention of spread of infection to others. But, as indicated above, there is no tendency for any great number of people to present themselves early for examination and diagnosis. In fact, many do not seek medical advice at any reasonable stage of the disease. In some cases it is because tuberculosis is not suspected, such as occurs in the old chronic fibroid type, and in some cases, because they are afraid they will be sent to a sanatorium or be put to bed at home. It is quite evident, then, if we expect to improve matters a great deal that some definite means of "going out after tuberculosis" must be employed, rather than relying on the patient to present himself voluntarily.

This brings us to the important subject of "case finding." This is the expression used by many of the health organizations interested in finding more tuberculosis. The practicing physician can do a great deal in this connection by urging suspects and all those in contact with the tuberculosis he sees, to be examined. Because of his knowledge of the importance of early diagnosis he should take advantage of any opportunity to disseminate more widely this knowledge among the people, for after all he is the ultimate health officer. And further, in transmitting his mortality and morbidity reports of tuberculosis to the official health agency, he is giving direct leads to foci of spread of tubercle bacilli, so that the workers of these organizations may actually go out and urge, bring in, or drive in to physicians or to clinics suspects or contacts for examination. Tuberculosis organizations and official health organizations can be extremely helpful in case finding. In fact, it is only the members of these groups who can go uninvited by the layman and urge him to see his doctor.

Still another means of finding tuberculosis, and probably the most comprehensive one, is through the use of the tuberculin test among children. Access to large numbers of children is relatively easy, and examining children means starting at the beginning which is the keynote of prevention. The intracutaneous tuberculin test (Mantoux) properly made will reveal almost 100 per cent of those who have a tuberculous infection. The positive test means merely that that individual has a tuberculous focus in his body which may be quiet or may be active. The test does not distinguish between the two, so it is necessary, through a history, physical examination, and X-ray of the chest to determine the extent of tuberculous involvement and whether or not it is producing symptoms. Various amounts of tuberculosis will be found in these children with positive tuberculin tests, but most of them will be found to have no manifest disease. Thus early diagnosis which has meant so much to all of us reaches its ultimate possibilities. Rarely will one of those children with a positive tuberculin test and no manifest disease, develop active tuberculosis, provided good nutrition and good general health are maintained, and provided he is removed from further contact with open tuberculosis. Also those who already have symptoms show remarkable ability to get well, provided they do not have an overwhelming infection and can receive good care. Space does not permit of a more detailed discussion of this interesting phase of the subject.

The care of the child himself with a positive tuberculin test offers excellent opportunities in the field of prevention. But this is not all. He has contracted his infection somewhere, and because of his more or less limited cruising range, very often the source of his infection is in his own family. Thus we use him as a lead to locate open tuberculosis, much of which has never been diagnosed and often not even suspected. Of course being unsuspected this type is most dangerous from the standpoint of spread because no preventive precautions are taken. Not only does one go from the child with the positive test to adult members of his family, but also to his sisters and brothers, who are apt to have been infected from the same source. If positive, they likewise are examined to determine the extent of their trouble.

If one had sufficient facilities, this plan would make it possible to trace in any community practically all the tuberculosis in its various stages, without waiting for those affected to present themselves voluntarily for examination. However, depending upon one's facilities, one child can be tested, the children of one or ten families can be tested, or one can test the children of one or of any number of schools.

Of course, in formulating a program of tuberculosis finding, one should not limit himself to one means, but should use all the means at his disposal, just as one uses all the means at his disposal for making diagnoses and for carrying out treatment.

The practicability of the above suggestions for the prevention of tuberculosis has been demonstrated over a period of six or seven years in the Department of Pediatrics of the Vanderbilt University Medical School. A much more extensive demonstration of the practicability of this scheme is being carried out by the Tennessee State Health Department. Several excellent intensive study demonstrations have been conducted by that Department, and one is in operation at present. In addition, they are carrying on continuously a state-wide diagnostic program. All of their full-time county health officers are taught to do tuberculin testing. Also, there are in the Department three well-trained clinicians who periodically hold diagnostic clinics throughout the state. Local physicians are welcome at these clinics and are encouraged to bring any patients whom they may wish to bring for chest examination and X-ray. All tuberculosis found at these clinics is turned over to the physicians for treatment, and the

physicians may, when it is desired, take advantage of the services of the public health nurses in their communities to aid in seeing that their patients are following directions.

Also in Tennessee, facilities are afforded at the Vanderbilt University Medical School, for any physicians who feel the need of it to receive additional training in the phases of tuberculosis work discussed above.

The tuberculosis problem is a stupendous one, and we have no illusions about the rapid solution of it. An attempt has been made to point out that already enough is known about tuberculosis to solve the problem, but to get this information spread widely and to get people to take advantage of it requires education, and educating is a slow process. Lest we feel overwhelmed by the immensity of the problem and the educational task confronting us, it might be well to recall that one comes before ten or twenty-five and we may start by taking care of each individual patient well as the most effective means of educating. Demonstration is not easily forgotten.

To say enough is already known to solve the tuberculosis problem, does not mean that we do not need to know more. Each new bit of information tends to make the task easier. In this connection vaccination against tuberculosis should be mentioned. Many attempts have been made to develop a vaccine but the efforts of Calmette and Guerin so far seem to offer the most hope. B. C. G. (*Bacillus-Calmette-Guerin*) is a strain of bovine bacilli grown on a special medium over a period of years which has reduced its virulence. The vaccine is a culture of live bacilli with a low virulence that originally was thought to be a fixed virulence. However, more recently it has been shown that the virulence of this culture can change. The principle underlying the use of the vaccine is sound. B. C. G. is given to uninfected individuals to produce in them some specific immunity to help them combat their first infection with virulent human organisms. It is not yet known how much immunity is produced by this vaccine nor how long it will last. Also, because the virulence of the vaccine can change, it is not yet well known whether the vaccination remains localized or whether the bacilli inoculated may spread and cause disease. Most experience in the use of the vaccine in human beings points against the latter danger. However, it is easily seen that B. C. G. is not yet ready for general uncontrolled use as a preventive measure.

THE  
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**MINNESOTA, NORTH DAKOTA, SOUTH DAKOTA and MONTANA**

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 South Dakota State Medical Association  
 The Hennepin County Medical Society

The Minnesota Academy of Medicine  
 The Soo Railway Surgical Association  
 The Sioux Valley Medical Association

North Dakota State Health Officers' Association  
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MINNEAPOLIS, MINN., OCTOBER 15, 1932

DR. HALBERT LOUIS DUNN, NEW SUPERINTENDENT OF MINNESOTA GENERAL HOSPITAL

The Minnesota General Hospital is a part of the University of Minnesota; hence, it is a teaching institution. The chief reasons for its existence are: The part it may play in preparing young physicians for the practice of medicine, the offering of modern facilities for those already in practice throughout the state to keep abreast of the times, and the contributions it may make to the advancement of knowledge. There was a time in the history of this institution when its superintendent was compelled to devote most of his time and energy to the building program. Through the efforts of the superintendents and the University administration of those days the building program has been practically completed. The Minnesota General, the Ancker, St. Paul, and the Minneapolis General Hospitals now provide ample facilities. There was a time when the superintendent was compelled to devote considerable effort toward developing the good will of the medical profession of the state; now as one travels about Minnesota, one hears practically nothing about the hospital from physicians except expressions of confidence and good will. Therefore, the institute is ready to enter upon its main task of teaching and research. Vast stores of information are in its records which should be made available to the medical profession.

The selection of Doctor Halbert Louis Dunn as superintendent at this time was particularly fortunate. Dr. Dunn's qualifications are excellent. First: He is highly trained in the fundamentals

of medicine, as well as its clinical practice, having received the degrees of Bachelor of Arts, Master of Arts, Doctor of Philosophy, Bachelor of Medicine, and Doctor of Medicine from the University of Minnesota, and having taken an internship in the Presbyterian Hospital in New York City and later a fellowship in medicine at the Mayo Clinic. He was elected to the Alpha Omega Alpha Fraternity and to the society of Sigma Xi. He already holds membership in the American Medical Association, the American Association of Anatomists, the Society of Experimental Biology and Medicine, the American Statistical Association, and the American Physiological Society.

Second: Dr. Dunn is a teacher of considerable experience and note. In 1919 he was elected teaching fellow in anatomy at the University of Minnesota. In 1922 he was promoted to an instructorship. The Johns Hopkins School of Hygiene and Public Health invited him to become Associate Professor of Biometry and Vital Statistics in 1925. He held this position until 1929, when he returned to the Mayo Clinic and Foundation in Biometry and Vital Statistics, and became Associate Professor of Biometry and Statistical Medicine at the University of Minnesota (Mayo Foundation.) In 1930 he was appointed Director of the Statistical Department at the Mayo Clinic. During that year he also conducted classes at the University of Minnesota one day of each week. Therefore, Dr. Dunn is highly qualified as a teacher. Moreover, he has a splendid attitude toward student and the members of the medical profession. He is well qualified not only to organize and hold the clinical staff of the hospital, but also to retain the good will of the profession and the people of the state.

Third: His sympathetic understanding of patients is one of his best qualifications. No teaching hospital can afford to graduate students who have any other attitude toward patients, regardless of their financial status. It is Dr. Dunn's

desire that every patient in the Minnesota General Hospital be treated by the physicians and nurses, both students and graduates, as each would desire that a member of his own family be treated.

Fourth: Dr. Dunn is highly trained and experienced in that particular subject which the University Hospital needs at this time more than anything else—medical statistics. There is a wealth of material passing through the Out-patient Department, as well as the hospital proper, which should be compiled and analyzed so that it may become useful to the medical profession and its associates in promoting the good health of our citizens. For the most part, in many hospitals the records have simply been filed away and little or no use has been made of them; in fact, many of them are in such form that nothing can be done with them. Through the preparation and adoption of new forms, and by the use of special systems, statistical material can be quickly compiled from the records so that analyses may be made. All of this and much more Dr. Dunn is qualified to perform and direct.

Fifth: He has demonstrated an unusual ability in the preparation and presentation of contributions to the medical profession by the publication of twenty-three articles and he now has several scientific projects under way. At an early date his book will be published which contains the results of most of his efforts for the last three years in developing a new medical nomenclature and adapting it to the needs of mechanical tabulation, in order to modernize the medical and surgical indices for hospital and clinics.

With his high scientific and practical training; with his understanding of students and physicians, particularly of Minnesota; with his sympathetic attitude toward patients; with his unusually good training in medical statistics; with his outstanding and numerous contributions; and his present progressive spirit, we must agree that no nearer approach to the ideal could have been made by the University administration of this particular time than by the selection of Dr. Dunn as superintendent of the Minnesota General Hospital.

J. A. M.

#### THE AIR WE BREATHE

*The Minneapolis Journal* has given some startling front page publicity to the subject of smoke-laden air promoting disease, that we would commend.

We demand healthful food and pure water but give little thought to the seven times that amount of air breathed each day. This, if pol-

luted by soot and noxious gases, tends to promote such diseases as sinusitis, tuberculosis and eye trouble. In fact every respiratory disorder may be caused or influenced by atmospheric conditions. In the country it is dust; in the cities the soot of smoke, grit, sulphuric acid, arsenic compounds, ash, carbon monoxide and tar are added.

So much for mechanical and chemical irritants. There are other and greater dangers. Dust particles furnish just that many aeroplanes whereupon bacteria may travel from one place to another, and that is the most serious side of the problem as physicians see it.

The pity of it is that soot and gas is an economic and unnecessary waste that efficient furnaces, properly fired, will burn, and it is through education along these lines that the *Journal* would eliminate the evil. Best wishes for abundant success.

A. E. H.

#### SOCIETIES

Minnesota Medical Alumni Home Coming Program, Eustis Auditorium, Elliot Hospital, October 28, 1932

9:00 A. M.—Dr. H. P. Ritchie, speaker.

9:00 A. M.—“Non Specific Prostatitis,” Dr. D. Creevy.

9:30 A. M.—“Mechanics in Genecology or Posture in Relation to Diseases of Women,” Dr. William Rumpf.

10:00 A. M.—“The Recurrent Goiter,” Dr. Martin Nordland.

10:30 A. M.—“Painful Feet in Adults,” Dr. M. S. Henderson.

11:00 A. M.—“Medical Treatment of Acute Sinusitis,” Dr. K. E. Phelps.

11:30 A. M.—“Manual and Visual Examination of the Rectum,” Dr. H. E. Hullseik.

12:30 —Lunch, University Hospital.  
Dean Scammon.  
Dr. H. Dunn.  
Business meeting.

2:00 P. M.—Dr. E. D. Anderson, speaker.

2:00 P. M.—Skin Clinic. Dr. C. A. Boreen.

2:30 P. M.—“Diseases of the Genato-Urinary System in Infants and Children,” Dr. R. E. Nutting.

3:00 P. M.—Department of Medicine.

3:30 P. M.—“Serial X-Ray Plates in Gastro Intestinal Studies,” Dr. R. Morse.

4:00 P. M.—“Treatment of the Ambulatory Cardiac Patient,” Dr. Moses Barron.

All medical men who are interested are cordially invited to attend the meeting.

Program of the Hennepin County Medical  
Society

Wednesday, October 19, 12:00-2:00

12:00-1:00—Demonstrations.

1:00-2:00—Trans-urethral Prostatectomy: F. E. B. Foley, M.D., St. Paul.

Discussion: Gilbert Thomas, M.D.

Ketogenic Diet in Pyelitis: H. F. Helmholtz, M.D., Rochester, Minn.

Discussion: Rood Taylor, M.D.

Wednesday, October 26, 12:00-2:00

12:00-1:00—Demonstrations.

1:00-2:00—Some New Developments in the Bacteriology of Actinomyces: A. T. Henrici, M.D., University of Minnesota.

Discussion: T. A. Peppard, M.D.

Surgical Treatment of Pulmonary Tuberculosis: T. J. Kinsella, M.D.

Discussion: S. R. Maxeiner, M.D.

Monday, November 7, 7:45 P. M.

7:45—Surgery in Ancient Egypt: Hermann Ranke, Ph.D., University of Heidelberg.

South Dakota Health Officers Association

The South Dakota Health Officers Association held their annual meeting at the Marvin-Hughitt Hotel, Huron, October 4. It was the largest attendance ever recorded at a Health Officers' meeting. There were more than seventy health officers and physicians at this gathering.

The program consisted of the following numbers:

"Prevention of Tuberculosis," H. A. Burns, M.D., Superintendent Minnesota Tuberculosis Sanatorium.

"Traehoma Among the Indians of South Dakota," C. E. Yates, M.D., U. S. Indian Service.

"Anthrax," Dr. Hayes of the U. S. Department of Animal Industry, Pierre, S. D.

"Pellagra," George E. Burman, M.D., Carthage, S. D.

"Botulism in North Dakota," Robert W. Allen, M.D., Director, Division of Bureau of Preventable Diseases of the North Dakota State Department of Health.

"Syphilis and Its Prevention," John Sutherland, M.D., Superintendent of the Marshall County Board of Health, Britton, S. D.

"Public Health Legal Questions," was to be discussed by the Honorable M. Q. Sharpe, but as he was unable to attend, former Supreme Judge James Brown, now a member of the Attorney General's office, substituted for Mr. Sharpe.

At the election of officers, E. T. Ramsey, M.D., of Clark, was re-elected President for the fourth time. J. B. Vaughn, M.D., of Castlewood, was elected Vice President, and A. E. Bostrom, M.D., was re-elected Secretary and Treasurer.

NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Dr. L. T. Francis of Renville, Minn., died at his home September 26, at the age of 77.

Dr. F. J. Plondke of St. Paul was married recently to Miss Madeline May Bruchman.

Dr. H. L. Sargeant formerly located at Dalton and Fergus Falls, Minn., died recently at Northfield, Minn.

Dr. Lawrence M. Larson formerly of the Mayo clinic is now associated with Dr. Martin Nordland of Minneapolis.

Dr. F. W. Van Valkenberg of Long Prairie, Minn., is now located in Philadelphia, Pa., where he is doing post graduate work.

The twenty-second annual Clinical Congress of the American College of Surgeons will be held in St. Louis, Mo., October 17-21.

Colonel Paul Shillock a graduate of the first class of the medical school of the University of Minnesota died recently in Minneapolis.

Dr. W. C. Dieterich resumed his practice at Huron, S. D., after an absence of several years, having practiced in Minneapolis for the past eight years.

Mother Harriet is now head of the St. John's Hospital in Fargo, N. D., succeeding Mother Gilbert, who is going to Trinity Hospital at Jamestown, N. D.

Dr. P. A. Lommen of Austin, Minn., was presented with a gold medal by the Southern Minnesota Medical Association in recognition of his paper on "Anemia."

Dr. T. L. Birnberg of St. Paul was the principal speaker at the Fall meeting of the Minnesota Dietetic Association which was held October 3, at the University of Minnesota.

More than 5,000 persons attended the recent ceremonies of the opening of the new Bethesda Hospital in St. Paul. Dr. Wm. J. Mayo was the principal speaker at the dedication.

Dr. J. M. Phillips of Bisbee, N. D., was badly injured recently while attending an auction sale at a farm where a bull broke away from his attendant, knocking Phillips down.

The regular meeting of the Minnesota Academy of Medicine was held October 12. The scientific program was given by Dr. F. C. Rodda, Byron J. Olson and Dr. Charles N. Spratt.

The annual meeting of the Minnesota Trudeau Medical Society was held recently at the Nicollet Hotel, Minneapolis. Early diagnosis and immediate treatment of tuberculosis was discussed.

Dr. Sibyl Smeby a recent graduate of the University of Minnesota Medical School died in Minneapolis. Dr. Smeby was born in Westbrook, Minnesota and graduated from St. Olaf College.

The South Dakota Health Officers Association held their fourth annual convention at Huron, S. D., October 4. Dr. E. T. Ramsey of Clark, S. D., is president and Dr. A. E. Bostrom of Waubay, S. D., is secretary.

Dr. Harry T. Hillstrom of Minneapolis, who for the past two years was head of the X-ray department of Vanderbilt University in Nashville, Tenn., died there recently of complications resulting from an automobile accident injury.

Dr. Henry Williams, Jr., son of the late Dr. H. L. Williams, former Minnesota football coach, recently joined the staff of the University Hospital in Minneapolis. Dr. Williams had spent the past six years at the Mayo Clinic in Rochester.

The Nicollet-LeSueur County Medical Association held their regular meeting at St. Peter, Minn., October 2. The program was given by the following doctors. O. H. Wolner, M. C. Peterson, M. E. Lenander and L. Kirchbaumer.

The first meeting of the Lewis and Clark (Mont.) county child health council was recently held at Helena, Mont., in the offices of Dr. Wm. Copenhaver, acting city-county health officer. Arrangements were made to hold pre-school clinics at various centers during the coming year.

Dr. F. G. Carter, Superintendent of Ancker Hospital in St. Paul, Minn., recently warned St. Paul and Ramsey county officials that unless immediate action was taken, proper care of the sick and injured could not be administered as the hospital is almost filled to capacity.

A new mode of scientific writing is attempted in a new magazine "MODERN MEDICINE," described as the newsmagazine of medicine which was recently published in Minneapolis. From all appearances this magazine seems to be of exceptional interest to the general practitioner.

Dr. J. F. D. Cook, of Langford, S. D., and Dr. J. R. Westaby, of Madison, S. D., recently at-

tended the following meetings: The Mitchell District Medical Society, Mitchell, S. D.; the Rosebud District Society meeting at Winner, S. D., and the Pierre District meeting at Pierre, S. D.

The Minnesota Pathological Society will meet October 18, at the University of Minnesota Institute of Anatomy. The scientific program will be "Recent Studies on the Nephroses," by Dr. E. T. Bell; "Comparative Physiology of the Kidney," by Dr. R. N. Bieter; discussion by Dr. G. E. Fahr.

The North Dakota state board of administration recently issued a schedule of reduction in maintenance costs of state institutions which will show a saving of \$547,000 for the fiscal year of 1932-33. The state hospital for the insane at Jamestown is running at a \$40,000 less operating cost than originally planned.

At the annual meeting of the Northwestern Hospital Association, Minneapolis, held on October 10, the following officers were elected: Dr. Martin Nordland, president; Dr. A. S. Hamilton, vice president; Dr. W. H. Rucker, secretary-treasurer, and Drs. F. A. Poppe and Walter Camp, members of the executive committee.

Dr. Oscar Daignault has been named school physician for the present year by the board of education of Benson Minn. He will supervise the plan in which all physicians in the city will co-operate with the school nurse in the prevention and control of communicable diseases. The physicians receive no compensation for this work.

The eleventh annual convention of the Central Neurophychiatric Association was held at Rochester, Minn., October 5 to October 8. Officers of the association are Dr. Karl A. Menninger, Topeka, Kans., president; Dr. Hans H. Reese, Madison, Wisc., vice president; Dr. John L. Eckel of Buffalo, counsellor, and Dr. Henry Waltman, Rochester, secretary-treasurer.

The Eastern Montana Medical Society and the Southwestern District Medical Society of North Dakota, held a joint meeting of their societies at Dickinson, N. D., recently. Following the banquet, a very fine scientific program was given. Dr. E. J. Engberg of St. Paul, Minn., was the guest speaker of the evening. He spoke on the subject of "Treatment of Psychiatric Patients in Private Practice."

Under the provisions of the will of the late Col. Cushman A. Rice of Willmar, Minnesota, the city of Willmar will receive the old Rice homestead and the attached property to establish

a hospital and Nurses' home. Under the terms of the will the executor is authorized to spend not more than \$50,000 in remodeling the home-stead into the hospital and up to \$7,000 in remodeling another building into a nurses' home.

The South Dakota state conference of social workers will meet in Madison, S. D., October 25 and 26. In connection with the conference the annual business meetings of the following component groups will be held at the same time: The Legion State Child Welfare Committee, the South Dakota Public Health Association, the County Child Welfare Board, and the County Judges Association, together with the State Child Welfare Commission.

Aiming at a saving estimated at \$47,000 due to illness reported by city employees, a special committee of the Minneapolis city council recently considered the feasibility of making the office of city physician a full time job. The plan, it was said at the meeting, would drastically reduce amounts paid to employees on sick leave, cut the cost of expert testimony in workmen's compensation cases and reduce inconvenience to employees wishing examination.

A delegation from the Hennepin County Medical society recently protested against the civil service commission ruling compelling members of the fire department fifty years of age or older to submit to physical examinations by the city health physician. The commission was told that the fire men have a right to go to their own physicians. Indications are that the city council would be asked to take action permitting fire men to go to their own physicians.

The last meeting of the Sioux Falls District Medical Society was held at the Cataract Hotel, Sioux Falls, S. D., October 11. The physicians from Madison, S. D., gave the following program. "Osteomyelitis of the Tip of the Petrous Portion of the Temporal Bones." Report of a case with post mortem findings. Dr. R. K. Miller, Madison, S. D. "A New Method of Post Operative Treatment in Supra-Public Prostatectomy." Dr. R. S. Westaby, Madison, S. D. Congenital Atresia of the jejunum, with report of a case, Dr. D. S. Baughman, Madison, S. D. The auxiliary met at the same time for a dinner, followed by bridge.

Three cottages for inmates at the colony for Epileptics at Cambridge, Minn., and a modern building at the State Public school at Owatonna, Minn., are requested by the State Board of Con-

trol in its budget of \$2,278,100 for the maintenance and improvements of the state's six welfare institutions during the next two years. This total which would care for the Cambridge and Owatonna institutions as well as the School for the Deaf and School for the Blind at Faribault, the Sanatorium for Consumptives at Ah-Gwah-Ching and the Gillette Hospital for Crippled Children at St. Paul, is \$52,800 under the 1931 allotments allowed by the Legislature.

The American Medical Association voiced a protest recently against government hospitalization. Speaking to the Shannon Committee investigating government competition with private enterprises, Dr. William C. Woodward representing the Association, said the policy of allowing free treatment to veterans for ailments not of military origin was unfair to the medical profession. "Government competition will tend to undermine the morale of the medical profession, to hinder its development, and leave the people without adequate medical service in the time of need, and without adequate medical resources in case of military necessity," said Dr. Woodward.

Mr. P. O. Olson who claims to have received a degree of Doctor of Naturopathy for the sum of \$300.00 after attending school for one year in Minneapolis, entered a plea of guilty to practicing healing without a basic science certificate before the Honorable Harold Baker, Judge of the District Court at Willmar, Minn., October 3. The judge sentenced the defendant to ninety days in the county jail which was suspended upon the following conditions. (1) That Olson pay the county's cost of the proceedings. (2) That the defendant absolutely refrain from practicing healing in any manner whatsoever in the state of Minnesota.

The Yankton District Medical Society held its fall meeting at the Yankton State Hospital, September 31, as the guest of Dr. G. S. Adams and his staff. A fine dinner was served in the Banquet Hall by Doctor and Mrs. Adams. There were about fifty-five or sixty at the table, which included the Ladies' Auxiliary and visitors. The scientific program was as follows: "Transurethral Prostatic Resection," presented by Dr. N. G. Alcock, Iowa City, Ia., (A Year's Experience) illustrated with lantern slides; "Furunculosis of the External Auditory Canal," by Dr. F. C. Smith, Yankton, S. D., "Impressions and Experiences with the Federal Indian Clinic," by Dr. Lottie G. Bigler, Yankton, S. D. There was a good attendance at the meeting which included the medical student body of Vermillion.

Mr. Walter Hawkins entered a plea of guilty to grand larceny in the second degree before the Honorable F. W. Senn Judge of the District Court at Mantorville, Minn. Hawkins was arrested in Northfield, Minn., following an investigation by the Minnesota State Board of Examiners, which showed that he had received \$125.00 in cash from a patient who had been ill for sometime. The patient was persuaded by Hawkins to part with this money on the representation by Hawkins that he would give her Divine Healing by the absent treatment route from Chicago each evening for a period of six weeks. At the expiration of the six weeks with no improvement in the patient's condition, Hawkins was placed under arrest. Hawkins is a licensed dentist in the state of Illinois. This is the first prosecution against an alleged Divine Healer since the passage of the Basic Science law in Minnesota.

### BOOK NOTICE

ELECTROSURGERY, by Howard A. Kelly, M.D., LL.D., F.A.C.S., Baltimore, Md., and Grant E. Ward, M.D., F.A.C.S., Baltimore, Md. With 382 illustrations by William P. Didusch and others. W. B. Saunders Co., 1932. Pp. XXII, 304, \$7.00.

Kelly became famous as the gynecological quadrant of the "Big Four" of Johns Hopkins but his versatility in other fields finds ample expression in this remarkable volume which deals adequately with the application of the newest and most valuable addition to the armamentarium of surgery in every possible phase. In collaboration with Ward he has produced in terse, well-illustrated form, a book which must prove invaluable to every operating surgeon, no matter what his special area of activity may be. The first four chapters are given over to History (of the development of electrosurgery), Physics of High Frequency Currents, Clinical and Laboratory Observations on Histological Changes, and General Principles. Then follow chapters on Skin, Oral Cavity, Otolaryngology, Thyroid, Thorax (by Thomas Bayron Aycock), Breast, Abdomen, Gynecology, Urology, Bladder Tumors (by Hugh H. Young), Proctology, Central Nervous System, and Irradiation and Electrosurgery, concluding with a classified bibliography covering fifteen pages.

It is difficult to do justice to this work within the limits of an ordinary critique. The book must be seen and read to appreciate its full value and the reviewer must content himself with an unqualified recommendation to all who count themselves progressive surgeons to grasp the opportunity therein presented.

GILBERT COTTAM.

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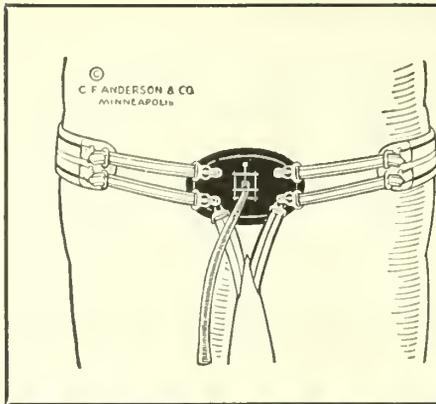
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## Can Prenatal Care Be Successfully Applied in Country Practice?\*

MARTIN C. BERGHEIM, M.D.

*Hazley, Minn.*

A CERTAIN doctor said to me when I was introduced to him about a year ago: "Oh! You are the one who is everlastingly hammering away at prenatal care." That is it; everlastingly hammering away. The ancient saying, "The slow, constant dripping of water from the roof will ultimately make a deep impression in the hard slab of rock below," gives the answer to the question, "can prenatal care be successfully applied in country practice?"

For a number of years I have constantly been "hammering away" at prenatal care and I am glad to say that at least some impression has been made. Every phase of prenatal work can be carried out in country practice, but it requires persistent, constant effort if it is to be successful.

In 1922, 15 per cent of my obstetrical cases reported for prenatal care. All of the pregnant women, whether they came in for prenatal care or not, were instructed as to the great importance of care during pregnancy to the mother and her baby. They were supplied with free literature on prenatal care: "Motherhood," and "Child Care." At the time of delivery, as well as at every other suitable time, the far-reaching importance of prenatal care to the mother and her child was impressed upon the mother and her family.

What were the results?

A small handful of snow may be the beginning of a huge rolling snowball. In 1929 a careful

review of my records showed that those coming in for prenatal care had, in six years, increased from 15 per cent to 83 per cent. Since 1929 to date over 90 per cent of all women delivered by me have appeared for prenatal care. Over 50 per cent of these reported before the end of the fourth month of gestation. It is satisfying, indeed, to note that more and more mothers are coming during the early months of pregnancy. (A remarkable record indeed!—Ed.) To get the remaining few is more difficult than getting the more than ninety per cent. There are still some older patients who had no prenatal care during previous pregnancies, who even had no doctor at the time of delivery. I still find the careless and mentally deficient thoughtless ones who "take a chance." And finally there is the primipara whose offspring arrives apparently prematurely, and who, due to embarrassment, will not come in for prenatal care. But, as time goes on, and as the laity is properly informed of the value of prenatal care even this remaining percentage will want it.

The experience of every physician who has taken prenatal work seriously is this, that the expectant mothers as well as their families, appreciate the value of careful attention during pregnancy as well as at delivery both for the mother and her offspring. Let the doctor take the proper interest in the pregnant mother, have her come in regularly, let him correct whatever is abnormal, let him assure her that everything is all right from month to month and later from week to

\*This paper prepared by invitation for this Special Obstetric Number of The Journal-Lancet.

week, and she will worry less, and things will not look nearly so dark when delivery approaches. The responsibility rests first and foremost with the physician. It is he who can help and properly instruct the expectant mother, not the thoughtless, badly informed relatives and meddling friends. The doctor must be willing to spend both time and energy in teaching the public, and his supply of patience and energy must be inexhaustible.

Preventive medicine has long been the watchword of the medical profession. Surely here is preventive medicine in a most important phase. It is during this period that we can detect irregularities and "nip in the bud" many, otherwise slight, pathological conditions which, if left untreated, would prove serious later in pregnancy or during and after delivery.

To the laity, not so long ago, prenatal care was entirely new. Today we find that the public is willing to learn, but how can they be properly instructed unless there is someone to teach. That responsibility is ours. It is possible for the doctor to do conscientious prenatal work whether he be located in the city or in the country. We can not go out on the highways and byways and force them to come in, to be sure, but a few will come because of necessity. These few make the entering wedge, and if the doctor uses this little opening right and gives good prenatal care, free of charge to the few, he has started the ball a-rolling. Good work will bring more patients. When we give good prenatal care to one patient others of her group will follow. "Cast your bread upon the waters, it shall return after many days."

Some of the great factors which serve to educate the public have been the community nurse, the distributing of valuable literature published by boards of health, public health associations, by The Childrens Bureau at Washington, and by the American Red Cross. The country doctor will do well to write to these various sources once a year for anything new on prenatal care. Such literature is very helpful to one's patients, and, incidentally, it aids the doctor in keeping up to date. Whatever publications are available on prenatal care and child care should be kept on hand at the office where maternity patients as well as others may help themselves.

Incidentally, I believe that all prenatal work done at the office should be free of charge. I charge a reasonable price for my obstetrical cases but make no extra charge for prenatal care. The cost, therefore, to the patient is the same whether she avails herself of the prenatal care offered or not. Especially during these days mothers will not report regularly if a charge is made for every

prenatal call. Of course ailments having no connection with the pregnancy do not come under free prenatal work.

Not so seldom it happens that I have two maternity cases in labor at the same time; or I may have an operation at the hospital; or there may be some other reason why I can not deliver a patient to whom I have given prenatal care. What then? Another doctor is, of course, called and I always give the patient and the physician the advantage of my free prenatal care.

A careful record must be kept of all obstetrical cases. During my stay in this community I have delivered many patients from three to five times. These records often are a great help in the management of the patient in the new pregnancy.

The first prenatal call includes a complete physical examination as well as a past history of the patient. Subsequent calls require an examination of the heart, blood pressure and urine, as well as a general observation of the patient. Any untoward symptoms appearing are noted and corrected. Later in pregnancy the position of the child is mapped out.

At the time of the first prenatal call the pelvic measurements are taken. When these measurements are not too decidedly decreased delivery may occur without resorting to radical means. The mother should be given a chance to deliver without interference, which she will usually do. In over 1,400 cases I have not yet had a case requiring cesarean section. The pelvic joints will give a little, the head will mould markedly or the child may be small. Nature is often both wise and kind. However, where there is any doubt as to whether or not the delivery can take place without radical procedure no vaginal examination should be made. Even in normal cases I find that rectal and abdominal examinations are sufficient in four-fifths of the cases.

During the prenatal period the heart, the kidneys and the blood pressure must be watched regularly, and heed must be paid to the slightest indication of trouble. The mother must nurse her baby without fail, and therefore the breasts and nipples should get special attention. If the nipples are small they can be enlarged by traction. A suitable ointment like lanolin should be applied daily during the last two months of pregnancy to render them less tender and thus help prevent fissures and possible infections later when the child begins to nurse.

The mouth and throat are examined for possible foci of infection. If such a focus is found it should promptly be cleared up. This can be done without undue risk during the first trimester.

It is well known that when there is a focus of infection somewhere in the body the infectious micro-organisms may be found in the blood of the patient. Hence it is important to treat such primary foci lest the organisms localize in the uterus after delivery and give rise to a post-partum infection.

It is important to note, especially in the primiparas, the general nutrition, and to examine the lungs carefully because of the high incidence of tuberculosis among young women. The general health of the patient must be considered, and malnourishment corrected.

Many young women of today have highly sensitive nervous systems from various causes, and consequently we find among them many nervous and mental problems when they become pregnant. These "neurotics" are very often exceedingly hard to manage. They constitute one of the difficult as well as one of the unpleasant problems that a doctor has to deal with in prenatal work. These patients are worried, in many instances they did not want to become pregnant; they are afraid of pregnancy, and become pale and nearly hysterical at the thought of approaching labor. Here is where good prenatal care can help to enlighten the patient, and counteract the weird, horrible tales of tragedy that are so often told by zealous relatives and neighbors.

A large majority of cases of vomiting of pregnancy are neurotic in origin and very seldom toxic. Often these patients vomit incessantly and clamor for the doctor to terminate the pregnancy. At times they must be hospitalized and isolated. Usually they ultimately respond to the proper treatment. Yet, one must always be alert to distinguish between the neurotic and the toxic types of vomiting.

During the first seven months, if everything is normal, the patient need not report more than once a month. During the eighth month she must report every two weeks and weekly during the last month. And if any abnormality develops the patient must report more frequently. If a grave condition threatens the patient is seen at her home or she may be hospitalized according to the gravity of the condition.

There is no physician, in general practice, who is so busy that he cannot afford to spend five to fifteen minutes, once or twice a month, to give the necessary prenatal care to his obstetrical patients.

Prenatal care is preventive medicine in a most important field.

The great responsibility of cutting down the maternal and infant mortality rate rests on the general practitioner and the practitioner in coun-

try practice. We are caring for a large majority of the obstetrical cases; therefore, we have the greater responsibility.

What are the fruits of prenatal care?

At the University of Minnesota the Department of Obstetrics and Gynecology has for many years past been "hammering away" at the importance of prenatal care by all doctors doing obstetrical work. As a result we have a death rate among mothers in this state of only 4.4 per 1,000. This is the lowest of all the states in the Union.

In California, in 1920, the maternal mortality rate per 1,000 total births was 6.8. As a result of prenatal care in that state the maternal death rate has been cut to 5.1 per thousand total births, an annual saving of almost two hundred mothers in that state alone. According to the department of health in New York City the death rate among pregnant women who had the proper prenatal care was only one-half as high as it was among those who had no such care.

In the prenatal clinic of the Louisville City Hospital during a five-year period ending in 1928, there were 3,217 deliveries. Of these 2,061 attended the prenatal clinic, while 1,156 received no prenatal care. Among those receiving prenatal care the death rate was 2.91; while the death rate among those who received no prenatal care was 22.4 per thousand deliveries.

A report of the demonstration made by the Commonwealth Fund shows the great value of preventive medicine in the field of prenatal care. The figures taken from four typical American Communities show that the "maternal death rate, still births and infant mortality under one month of age, were double in the group receiving no prenatal care."

One authority speaking for a certain district in the city of Brooklyn says: "In the district influenced by our prenatal clinic not only has the mortality in eclampsia been lowered, but severe eclampsia is an exception." And this he attributes "to continuous prenatal propaganda." This same authority gives the maternal death rate per thousand in a series of 12,066 cases, which were divided among five different hospitals and teaching units. All of these patients received prenatal care and good care during delivery. The average maternal death rate for the whole series was 3.5 per thousand, while the rate for the city at large was twice that high.

If we who are doing obstetrical work can cut the maternal mortality rate down from 6.2 which it is in the United States today, to 3.5 as has been done by these prenatal clinics in Brooklyn, we would by so doing save annually 7,000 mothers.

True, we cannot reduce the death rate to nil, because of difficult cases that will develop, and because of miscarriages, abortions, poor health and improper hygiene. But we can cut the death rate in two. What has been of such great benefit to individual communities will be of equally great benefit to individual states and to the country at large.

Prenatal care reduces the number of maternal deaths decidedly. There are innumerable ailments which are serious and which give great discomfort

and pain to the pregnant mother, and which by proper prenatal care can in most cases be relieved. It is the duty of those in the medical profession to relieve suffering and to save and prolong life. Here then is an opportunity. Save the mothers and the infants. It is our sacred duty to be everlastingly at it: and in course of time our efforts will bear fruit; we shall not fail to make a deep and lasting impression.

My experience is that prenatal care can be successfully applied in country practice.

## The Biological Tests for Pregnancy\*

GEORGE E. HUDSON, M.D.

*Minneapolis*

THE most important contributions to obstetrics in recent years are unquestionably the various biological tests for pregnancy and it is interesting to note that while the clinician is the greatest beneficiary of these tests, their development is, for the most part, due to the research labors of anatomists, physiologists and biochemists.

Until Aschheim and Zondek demonstrated the value of their test to a world hesitant to believe that there could possibly be anything new in obstetrics, we were compelled to rely on the history and especially the bimanual examination for the diagnosis of early pregnancy, and our success or failure depended very largely upon whether or not we had had the opportunity to make frequent vaginal examinations. Now, fortunately, due to the efforts of such men as Frank, Parkes, Aschheim, P. E. Smith and Evans, we have a test which can be depended upon in ninety-eight per cent of all positive cases, from about a week after the patient misses her period, until a week or ten days postpartum.

The more important pregnancy tests are as follows:

### THE FRANK TEST

Forty cc. of venous blood is necessary for this test. From this blood the estrin or theelin is extracted and injected in three equal portions, at three to four-hour intervals, into an adult white mouse, castrated at least fourteen days previously, and from which the vaginal smears have remained consistently negative. A vaginal smear taken thirty-six to forty-eight hours after injection is positive if only non-nucleated squamous

epithelial cells are present. Of eighty-five pregnant women, none showed a positive test in the first four weeks, only fifteen in the second four weeks and over half in the third four weeks. Only in the last four weeks of pregnancy was the test positive in all cases.

### THE MAZAR AND HOFFMAN TEST

Ten cc. of catheterized urine is injected intraperitoneally into castrated adult mice or rats, in five equal doses, over a period of two days. Vaginal smears are made at regular intervals. If the smear contains no leucocytes, but only nucleated and non-nucleated epithelial cells, the urine is positive for pregnancy. Like the Frank test, this test depends upon the production of an estrous phenomenon by a hormone secreted by the maturing ovarian follicle. The results are about seventy-five per cent correct.

### MANOILIV REACTION

To 0.3 cc. of blood serum are added 1 cc. of a two per cent aqueous solution of theobromine sodium salicylate and one drop of alkaline solution of Nile blue. If the serum is from a pregnant woman, the blue color becomes yellow or reddish yellow and the reading may be made at the end of one hour. In the absence of pregnancy, no color change is noted.

### THE MARKEE TEST

This test depends upon the fact that the injection of the follicular hormone arrests the rhythmic vascular changes in the uterus of the rabbit. A similar inhibition of vascular changes occurs in transplants of uterine mucosa into the eyes of rabbits. The modification of rhythm begins about thirty minutes after the injection of the hormone

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and the persistence of the reaction is roughly proportional to the quantity of hormone injected. The ovaries of the animal must be present. The reliability of the test is not yet determined.

#### THE BROUHA TEST

Four male mice, eight to fifteen grams in weight, are injected with 0.1 to 0.4 cc. of morning urine, daily for from eight to ten days. They are killed twenty-four hours following the last injection. The reaction is positive when the seminal vesicles are abnormally enlarged, swollen and distended with a whitish fluid.

#### THE BERCOVITZ TEST

When the normal individual's blood serum is injected into the conjunctival sac, there is first noticed a sudden spasm of accommodation. Following this, no change in the size of the pupil is noted. If dilatation or contraction follows the first spasm, the patient from whom the blood serum has been taken, is pregnant.

#### THE ASCHHEIM-ZONDEK TEST<sup>1</sup>

The presence of ovary-stimulating hormones in the urine of pregnant women led Aschheim and Zondek to suggest the injection of one or two cc. of pregnant urine into immature mice as a test for pregnancy.

The details of the test, as eventually described by them, are as follows:

1. Five mice are injected with 0.3 cc. urine, subcutaneously, twice a day for three days.
2. Weight of the mice 6-8 grams; age 3-5 weeks.
3. The mice are autopsied at 100 hours after the first injection.

The effect of the urine on the mice is as follows:

1. Ripening of the follicles.
2. Hemorrhage into the mature, partly luteinized follicles.
3. Luteinization of the follicles with the formation of corpora lutea atretica.
4. Enlargement of the ovary.

The first and fourth reactions are suggestive, the second and third are diagnostic and usually can be determined macroscopically by naked eye inspection, or with the hand lens. Should there be any doubt regarding the reaction, the ovaries must be fixed and several sections cut for microscopic study.

#### THE FRIEDMAN TEST<sup>2</sup>

Friedman found that the adult rabbit could be used because of the fact that it ovulates only after copulation. Four cubic centimeters of suspected urine are injected intravenously, three times a day, for two days. Forty-eight hours after the first

injection the rabbit is anaesthetized and its abdomen opened. If corpora lutea or corpora hemorrhagica are found, the reaction is positive.

#### THE REINHART-SCOTT MODIFICATION OF THE FRIEDMAN TEST<sup>3</sup>

Five to fifteen cubic centimeters of urine are given intravenously as a single injection. At the end of twenty-four hours the ovaries are examined and are usually found to be positive if the patient is pregnant. If they are negative, five cubic centimeters more of urine are injected intravenously and the ovaries re-examined through the same incision twenty-four hours later. As the ovary of the rabbit is much larger than that of the mouse, no difficulty is experienced in detecting the corpora hemorrhagica and corpora lutea on gross examination.

For both the Friedman Test and its modification the non-pregnant doe must be about three months old and weigh four pounds or more. Each doe must be kept in a separate pen for at least one week before the test, as irritation of the vagina from any source may be followed by ovulation.

#### THE BROWN TEST

Recently T. K. Brown<sup>4</sup> and S. D. Soule,<sup>5</sup> of St. Louis, have injected the rabbit intravenously with the blood serum instead of the urine of pregnant women. The effect of the serum on the ovary of the animal was found to be the same as that of the urine.

Approximately ten cubic centimeters of whole blood are obtained from the patient and the serum removed. The serum is allowed to stand for at least four hours before injection, as fresh serum is toxic and may cause death. The average amount of serum necessary for best results was found to be one cubic centimeter per 600 or 700 grams of body weight of the animal. Rabbits weighing from 1500 to 1600 grams gave the most reliable results. Two false reactions are reported in a total of 350 tests.

Of all the tests enumerated, only the last four are now in practical use and of these four the Friedman and its modification have been found most practicable and satisfactory.

If a doctor suspects an early pregnancy he has only to send about three or four ounces of morning urine as soon as possible after it is passed, and by the speediest possible route, to some laboratory where the Friedman or the Scott-Reinhart test is performed, and in from twenty-four to forty-eight hours after receipt of the urine, the technician can send him a report which has been found by numerous observers to be correct in ninety-eight per cent of all suspected cases.

If the urine is not injected intravenously 0.2 cubic centimeters of metacresol may be added to every 100 cubic centimeters of urine as a preservative. Whenever and wherever possible the urine should be kept on ice until the technician is ready to use it. If cloudy the urine is made slightly acid to litmus and filtered before being injected.

A positive test indicates the presence of living tissue, derived from a fertilized ovum. It is positive in intrauterine and extrauterine pregnancy, hydatid mole and chorionepithelioma, as long as the ovum or any of its elements are alive and proliferating. The test is not entirely specific; the conditions likely to give a positive reaction in the non-pregnant woman being severe endocrine disorders, carcinoma, the menopause and probably bilateral ovariectomy.

The source of the Gonad-stimulating principle, found in pregnant urine, is not definitely known, but the weight of evidence at present available does not favor the anterior hypophysis.

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## The Treatment of the Nausea and Vomiting of Pregnancy\*

JOHN H. MOORE, M.D., F.A.C.S.

*Grand Forks, N. D.*

**V**OMITING of pregnancy is a disease, partly preventable, almost always curable. It deserves recognition as a disease because of its disastrous possibilities. It has too long been regarded as a minor symptom. It should be regarded as a criterion of a generally disturbed metabolism.

I do not intend to consider the various theories that have been advanced to explain the vomiting of pregnancy. The subject is discussed from experience gathered solely from private practice.

I have reviewed the histories of 500 obstetric patients who came for pre-natal care during the first trimester of pregnancy. Nausea was a major complaint in 82, and nausea and vomiting in 273, a total of 355 patients who were in need of treatment.

Of the 355 patients, 164 were treated successfully by diet alone, 153 were relieved by diet and medication and 19 required hospital treatment. There were 2 cases of true hyperemesis gravidarum that were treated successfully in the hospital, both by intravenous dextrose solution; one of them did not respond to this treatment so it was necessary to do a therapeutic abortion. Both of these were late cases and were desperately ill on admission. The remaining 17 patients cannot be classified as to the results of treatment because of incomplete follow-up records.

\*This paper prepared by invitation for this Special Obstetric Number of The Journal-Lancet.

The patient with nausea only is the one that affords the best opportunity for prophylactic treatment. Vomiting of only a few days duration increases the difficulties encountered.

At the outset of treatment the patient must be told that food is her salvation. I can vividly recall a 21-day crossing of the Atlantic ocean because for 17 of those days I was sea-sick. I would recommend a siege of sea-sickness for every doctor who attempts to treat a case of vomiting of pregnancy. It would put him in a receptive frame of mind to appreciate his patient's abhorrence of food. The truth is that, with such a patient, the very thought of food is nauseating, just as it is to the sea-sick patient.

The essential thing, however, is to get the patient to take food. Sugar is her salvation. Carbohydrates must be crowded upon her in various forms, even to the point of producing an alimentary glycosuria. It takes time and patience and sometimes threats to accomplish the task but it can be done. Tell the patient that you do not expect her to relish her food, tell her to regard it as the worst medicine she ever took, if necessary; but tell her, above all else, that if she will persist and take even a small quantity of the diet prescribed at the hours indicated she will recover quickly.

It is of but little use to talk in general terms about diet to such a patient. She must have specific directions as to what foods you expect

her to eat and, what is just as important, when to eat them.

I have tried and discarded many diets. The one I present at this time has been most satisfactory and, with but slight modifications at times to suit individual tastes, it has not been changed during the past five years. Nausea and vomiting in pregnancy are much harder to control when the stomach is empty. I would call particular attention to the value of frequent small meals instead of the usual three meals a day and that specific instructions are necessary as to type of food and time of eating.

#### DIET

##### *Before arising (6 A. M.)*

One thin slice of crisp buttered toast.

A glass of milk or coffee with cream and sugar. The patient should take this food reclining, and she must remain in bed for at least 1 hour after eating.

##### *Breakfast (8 A. M.)*

Orange, grape-fruit, apple sauce or stewed prunes.

One soft-boiled or poached egg, or two slices of crisp lean bacon.

Small serving of cereal with cream and sugar.

One thin slice of crisp buttered toast.

Coffee, cocoa or milk.

##### *At 10 A. M.*

Vanilla or nabisco wafers.

Glass of milk.

##### *Lunch (12 noon)*

Cream of asparagus, celery or corn soup.

Saltines (salt soup crackers.)

Vegetable or fruit salad with lemon dressing—no spices.

Two thin slices of whole-wheat or rye bread, buttered.

Ice cream, jello or custard.

##### *Tea (3 P. M.)*

One cup of chocolate, or tea with lemon and sugar.

Simple cake, sugar cookies or crackers.

##### *Dinner (6:30 P. M.)*

One cup of bouillon or vegetable soup with Saltines.

A small steak, lamb chop, beef roast or chicken.

Two tablespoonfuls of mashed potato or small baked potato.

One thin slice of bread with butter.

Fresh salad, without spicy dressing.

Ice cream, sherbet, fresh or canned fruit.

##### *At bed-time (10 P. M.)*

Glass of hot or cold plain or malted milk.

Two oatmeal or graham crackers.

For the patient with nausea only, or for the patient who has only vomited for a day or two, the diet is the only treatment prescribed. Such a patient, however, is asked to report not later than one week from the time the diet is started, or within two or three days if she is not greatly improved. She is also requested to take all of her meals in bed for the first few days, where that is possible, and, at the very least, to take her early morning breakfast and her regular breakfast in bed and not to get up sooner than one hour after eating.

No laxatives are used at this time. Enemas or suppositories constitute the only treatment for even the most obstinate cases of constipation.

In cases where the patients have not been relieved by diet alone or in those cases that appear too far advanced to be relieved entirely by diet, drugs must be used. Experience favors the bromides. No one has yet succeeded in making a palatable bromide mixture but a great deal of the objectionable, salty taste has been overcome in the elixir of pentabromides. This contains the equivalent of 15 grains of sodium bromide in each teaspoonful. This is the standard preparation and the standard dosage used. It is given in one-half ounce of water three times a day, fifteen minutes before the regular meals but not before the extra meals. It is surprisingly well tolerated.

The majority of the patients require no additional medication. Occasionally the dose is doubled for the first three days of treatment and then reduced to the standard dosage for one week. At other times codeine sulphate in  $\frac{1}{4}$  to  $\frac{1}{2}$  grain doses is given three times a day, one-half hour before meals, in addition to the bromide medication.

Under this plan of treatment a bromide rash not infrequently occurs. This is rather a welcome sign as it indicates that the limit of the individual's tolerance has been reached and one can then regulate the dosage accordingly.

In those rare cases in which the elixir of pentabromides cannot be retained, sodium bromide in one drachm doses, dissolved in two ounces of warm milk is prescribed as a retention enema. This necessitates bed treatment of the patient. The bromide enema should be repeated every four hours until the patient is drowsy or actually asleep and has to be awakened to take food.

One may occasionally find a patient to whom the bromides in any form are unacceptable. In such a patient one may at times secure fairly good results by the administration of Sodium

Amytal in from one-half to one grain doses or Pentobarbital sodium in one-half grain doses three times a day before meals, either by mouth or in suppositories.

If, in spite of the foregoing treatment, the vomiting continues, a change of environment should be insisted upon. Where a hospital is available it offers the best chance for a speedy cure. The sights and sounds and smells of the kitchen are frequently too much for the pregnant woman who is vomiting; and the disturbance of children or visitors or the presence of the husband often adds to the mental burden that is already too heavy. I am not speaking of the case of true hyperemesis gravidarum in this connection, only of the so-called "normal" vomiting of pregnancy; but it should ever be borne in mind that this type of so-called "normal" patient is the one that furnishes that terrible toxicosis of pregnancy if neglected.

In the hospital, preferably, or in new surroundings with quiet assured, one should immediately begin the intravenous administration of sterile dextrose solution. We have too long regarded the intravenous administration of dextrose as a last resort measure. In a series of cases where the vomiting of pregnancy has persisted for more than one week I have found blood sugar readings as low as 60 to 64 milligrams per 100 c.cm. of blood, and, in one instance, a carbon dioxide combining power of 28. In all of those cases acetone or diacetic acid or both were found in the urine.

The patient is first given 300 to 500 c.cm. of a 20 per cent solution of dextrose intravenously in sterile, triple-distilled water. The rate of injection should not exceed 5 c.cm. per minute

This injection should be given at least twice daily until the patient retains her food. Excluding the cases of true hyperemesis gravidarum, I have not had to give the intravenous administration of dextrose solution more than four times to any one patient. One must observe great care in the preparation of solutions for intravenous administration. The dextrose is obtained in ampoules from one of several reliable manufacturers and the distilled water is obtained by distilling Chippewa Spring water, placing it in sterile flasks and sterilizing it in the autoclave. Our freedom from reactions more than justifies this procedure.

Regular feedings by mouth should be insisted upon as soon as possible with a rapid return to the diet as originally given. The administration of bromides should also be continued. During recent months I have been giving these patients viosterol in 20 drop doses three times daily and have felt that their general well-being has been increased.

#### SUMMARY

1. Every case of nausea or vomiting of pregnancy should have the personal, active and sympathetic interest of the physician at the earliest possible moment.
2. An excess of carbohydrates in palatable form constitutes the most important item in the treatment of such a case.
3. Drug therapy is limited to the bromides with the occasional use of codeine or a barbiturates.
4. The intravenous administration of dextrose is a remedy that will control the persistent type of vomiting before the case becomes one of hyperemesis gravidarum.

## Cause and Treatment of the Toxemias of Pregnancy\*

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OF ALL theories concerning the probable cause or causes of the toxemias of pregnancy, there is only one by which every manifestation of these entities may reasonably be explained, and by which the most successful treatment can be directed. This theory attributes the source of the toxin or toxins to the cells of the fertilized ovum. When the parental proteins of the spermatozoon and the ovum fuse, the products

of life and death of the resulting cells may be either toxic or non-toxic to the mother, according to the direction given by the protein of the spermatozoon. If the resulting cells are non-toxic to the mother, their exo-products of growth and endo-products of death will be absorbed and eliminated by the mother with little or no reaction; if toxic, the exo-products and endo-products of the cells assume the role of exotoxins and endotoxins as in the case of bacteria. It is suggestive to note that pregnancy, like bacterial invasion, causes a

\*Read at the October 13th meeting of the Minneapolis Clinical Club.

leucocytosis, a marked lowering of the sedimentation time of the blood and at times profound anemias.

Clinical observations would lead one to estimate that in approximately 80 per cent of pregnancies the exo-products and endo-products of the cells are sufficiently foreign to the maternal organism to cause pathologic manifestations. To attain the greatest measure of success in prophylaxis and treatment it is essential that we visualize the source of the toxin and the probable rationale of its action, because if we do not, we will lose our severe cases by procrastination in removing the source of the toxin before irreparable damage has been sustained by the maternal organism. Many deaths from early toxemia have been due to a mistaken idea as to the cause of the toxemia. One considers it a psychosis amenable to psychotherapy; another considers it entirely a result of hypoglycemia and dehydration and completely amenable to the administration of glucose and water. In other words an important therapeutic measure is looked upon by its advocates as a primary cause and the woman dies because she has not been relieved of the source of the toxin before it has caused irreparable damage to her vital organs.

When discussing the probable source of the toxin we must confine ourselves to fatal cases and autopsy findings because in any given case that recovers we cannot know the part played by the mind, by neglect of early and proper treatment of nausea and vomiting with resulting hypoglycemia, dehydration, starvation and acidosis. If one contends in these cases that recover that the cause of the condition was psychic, reflex, bacterial or deficiency of carbohydrates and that treatment directed against any one of these conditions taken as a cause brought about the cure, who can refute the contention. The proof must be found in cases coming to autopsy. There it is evident that although profound mental states, infections and hypoglycemia may cause demonstrable anatomic lesions some of which are similar to the lesions found in fatal cases of early toxemia, yet without pregnancy the lesions are not quite identical, nor is the complete picture similar. If pregnancy must obtain to produce the complete pathologic picture, it is reasonable to assume that the toxin must come from the products of conception. Again, when we submit other theories to clinical and experimental observation and comparison they will not stand up under examination. If the cause be psychic, why should some of the most severe accessions occur again and again in some women who are very desirous of becoming preg-

nant and have no reason for malingering; or why should some women show profound toxemia who do not even suspect that they are pregnant? If it has a reflex origin, why should it not have occurred when the stem pessary was used? Again, why does it not obtain in the presence of intrauterine polyps and submucous fibromyomata much larger than the developing ovum at the time that toxic signs and symptoms begin? If the condition be due fundamentally to hypoglycemia and dehydration, why cannot we produce the pathologic picture in an experimental animal at any time? If it be due to deleterious effects of bacteria on the eliminative organs of the mother, what accounts for the different autopsy picture? No, I believe we must look upon the earliest and slightest signs of deviation from the normal in the pregnant woman as results of a toxin arising from the developing ovum. The mind in certain cases may increase the severity of the symptoms, existing pathology may aggravate the condition, the profound effects of poor oxygenation, dehydration, hypoglycemia and starvation acidosis are known to us all and we can reasonably postulate that bacteria may increase the pathology by harming the vital organs of the mother as in any infection and by bringing about conditions that may result in focal death of the trophoblastic cells thereby increasing the endo-toxins to be absorbed and eliminated by the mother, but when presented with all this complicated mechanism we must not lose sight of the fundamental and primary source of the toxin.

To the possible nature of the toxin there is an experimental and clinical field that is suggestive in its findings and in their application to early toxemia. This is the field of anaphylaxis. It has been reported that a liver lesion, that appears to be similar to that found in fatal cases of early toxemia, has been found in cases of anaphylactic death. Also it has been found that if an animal is sensitized to a given protein and a minimal lethal dose of that protein is then administered, the animal will recover if sufficiently under the influence of the sedatives of the bromid and chloral groups. This suggests the possible protein nature of the toxin in pregnancy toxemia, and further suggests another rational basis for the bromid treatment of this toxemia that empirically has given such excellent results.

Prophylactic treatment against early pregnancy toxemia consists in the clearing up of all areas of focal infection and protecting as far as possible against all general infection to prevent possible destruction of trophoblastic cells with liberation of endotoxins and to protect the maternal organ-

ism from the deleterious effects found in the non-pregnant. Plenty of fresh air to protect the liver cells; a high carbohydrate diet, further protection to liver cells in the presence of a circulating toxin; and so lowering the irritability of the nervous system and vomiting center by sleep, rest and bromides that the vicious train of dehydration, hypoglycemia and starvation acidosis will not result from vomiting. If women in early pregnancy are subjected to this regime the serious forms of early toxemia will be encountered only rarely.

They should be counselled to eat carbohydrates; fruit, candy, cereals, popcorn, crackers or other cereals or sweets at intervals of two hours. Thus attempting to keep the glycogen content of the liver cells high, much as we prepare the liver for a general anaesthetic and a severe operation. If nausea or vomiting is present, they should be given bromides in sufficient quantity to keep it in abeyance. If given by mouth, one of the most agreeable forms of administration is to dissolve a sedobrol cube in a cup of boiling water. Each cube contains about seventeen grains of bromide and the concoction tastes like *consommé*. When sipped as *consommé* in conjunction with saltine crackers it is usually well liked. It must be taken very hot to be palatable. If the taste of *consommé* is not palatable, the bromide may be given in elixir of lactopeptine. If bromides are not well borne by mouth, they may be dispensed in powders in dosage up to sixty grains to be dissolved in a cup of warm water and taken as a retention enema, every four hours if necessary.

A symptom frequently complained of by pregnant women and one provocative of nausea, is a disagreeable taste. This may obtain with or without the taking of bromides. It may be combatted by the frequent use of a pungent dentifrice, by a pleasing mouth wash, by candy or by the chewing of gum flavored according to individual taste.

As a general rule, nausea is most frequent on rising. This is apparently due to a brain anemia upon assuming the erect position before the circulation is vigorously established. The vomitus at this time consists of nothing but bile stained mucus and fluid. It is well to counsel the taking of two glasses of hot water and throwing it up, thus washing out the stomach and not attempting to get up again until breakfast has been taken and the circulation is well established. This dizziness, so provocative of nausea and vomiting, and due in part at least to cerebral anemia, is sometimes helped by tying a ribbon snugly enough around the neck to interfere with the return flow of the external jugular veins.

It is important to keep the bowels open by any method best suited to the individual case.

Under such regime, confinement to bed is seldom necessary.

If the toxemia is not held in abeyance by the above measures, and a retroversion of the uterus exists, replace it and hold it in the anterior position with an Albert Smith pessary until the uterus grows out of the pelvis and is large enough to remain above the brim of the pelvis. Ordinarily, when such an indication does not exist, I believe it is safer, because of the danger of a possible abortion, to allow the uterus to grow out of the pelvis without manual replacement, relying upon the postural exercises such as the kneechest position, and the monkey walk to aid in throwing it forward. The occasional case that change of position of the uterus seems to aid warrants its trial.

Severe cases, depending largely upon the pulse rate, should be confined to bed and kept in the horizontal position. Pregnant women with a continuously rising pulse rate should be kept in bed no matter how favorable other clinical and laboratory findings may be.

If, when in the horizontal position, nausea and vomiting persist to the extent of interfering with nourishment and hydration, food and fluid by mouth should be interdicted and glucose and fluid given by bowel or intravenously until vomiting has ceased for twenty-four hours. The patient should be completely isolated from relatives and friends, her room should be continuously well ventilated to assure proper oxygenation, and it is well to have your best nurse in attendance, both to assure the greatest finesse in giving medication and to recognize the first signs of mental wandering or delirium. I know of no situation in which success or failure depends more upon the technical ability and the alertness of the nurse.

In the administration of glucose and fluids I have always preferred the rectal to the intravenous administration because of its simplicity, and because it is free from any danger of reaction and is not subject to the danger of slips in aseptic technic. 1000 cc. of 5 per cent glucose solution is given 40 drops to the minute. Fifty grams of glucose and 1000 cc. of water can be given in approximately six hours. Bromides in required amounts may be added to the proctoclysis. In some instances, retention enemas of glucose are better borne.

It is seldom that one must resort to the intravenous method, although demands of rapidity and irritability of the bowel may make the intravenous route necessary. I prefer a 10 per cent solu-

tion, giving at one administration 1 gm. of glucose per kilo of body weight.

Although this treatment is almost always successful, now and then cases appear in which the toxin is so potent that nothing short of a therapeutic abortion will save the patient. What are the signs that imperatively call for therapeutic abortion? These signs are simple, and require no instruments of precision or complicated laboratory technic for their recognition. They are pulse rate rising above 120 and not reducible by rest, hydration and glucose administration, mental wandering or delirium or stupor, better expressed possibly as mental change; and signs of toxic myelitis. In practically every death that I have seen, these signs had been present for days before demise, and their significance ignored, or procrastination allowed because it was thought that all would be well if sufficient glucose and water could be administered intravenously. With our present day facilities for accurate observation, multiple consultations and laboratory examinations, malingering is impossible and so need never offer a reason for procrastination in emptying the uterus.

It is well known that at or about the time of the completion of the formation of the placenta, early toxemia usually subsides. This may be the result of the establishment of a certain degree of immunity by the maternal organism, may be due to a physiological action of the placenta, or because the trophoblastic processes outside of the placenta have by this time been absorbed, and no longer pour their endotoxins into the maternal circulation. At times, however, it does not subside or subsides to a certain extent and later increases, and the patient dies in the later months of pregnancy showing autopsy lesions characteristic of early toxemia. Such findings make it reasonable to assume that the toxin of early pregnancy may be active throughout pregnancy, its ravages being held in check by acquired immunity on the part of the mother, proper regime of the patient, and individual resistance of maternal cells.

The difference between the symptoms, signs and autopsy findings of early toxemia and late or preeclamptic toxemia are so striking that it seems only reasonable to postulate that their causative toxins are different. Whatever that toxin may be, autopsy records confirm the fact that the lesions, pathognomonic of preeclamptic toxemia, have been seen as early as the second and third month of pregnancy. This is quite convincing evidence that the toxin of late pregnancy toxemia may be active right from the beginning of preg-

nancy, as in the toxin of early toxemia. For purposes of visualization I differentiate them as an exotoxin and an endotoxin. They may both be endotoxins or exotoxins. It is not without the bounds of reason to account for the difference in manifestations by differences in cellular susceptibility to the same toxin acting under different physiologic conditions and modified by different maternity immunity reactions. For practical purposes it makes no difference about the nature and number of toxins involved so long as we properly visualize their source and realize that the cells of the ovum if living and toxic are probably pouring out exotoxins for absorption and elimination by the maternal organism, and if dead and toxic are likely delivering endotoxins to the maternal organism.

The autopsy lesions of preeclamptic toxemia are pathognomonic of that condition alone. In the liver, hemorrhagic necrosis, and in the kidney narrowing of the lumina of the glomerular capillaries, due principally to a massive thickening of the capillary basement membrane and to an increase in endothelial cells. Bell says that the glomeruli of glomerulo nephritis and eclampsia can be distinguished without difficulty. Thus the fact remains that in spite of complicating phenomena brought about by previous kidney impairment, associated or not with infection, the lesions of late pregnancy toxemia cannot be duplicated by nephritic or infective postmortum findings, and thus it seems that the toxin must come from the products of conception.

Here, as in early pregnancy, clinical data lead one to the conclusion that the cells of one developing fertilized ovum may be relatively non-toxic and the cells of another toxic. We know that the products of conception in some instances can die and be absorbed with little or no reaction manifest in the mother. In twin pregnancies we may find at delivery one placenta and fetus almost entirely absorbed without there having been a sign or symptom of its existence. On the other hand the death of one twin and placenta may initiate a profound toxemia. When toxic, clinical data would lead one to postulate that all cells of the ovum are toxic: embryo, trophoblast and later placenta. Preeclamptic toxemia in hydatidiform mole shows that the toxin can reside in cells apart from the embryo; whereas it is a common clinical observation that the death of the fetus in a preeclamptic toxemia often marks a recession in the symptoms, explained reasonably by the fact that the fetal circulation has stopped bringing toxins from the fetal cells to the placenta. After this temporary remission, absorp-

tion of the dead placenta and fetus brings a return of severe symptoms.

To my mind the outstanding clinical finding associated with preeclamptic toxemia is the presence of placental infarction or necrosis, call it what you will. I have never seen a case in which marked placental necrosis was not present, or in which focal changes in placental coloration did not obtain to suggest a recent death of placental cells, which cells would later be consolidated into the entity known as a placental infarct or necrosis. It has been in some of the fulmination cases that this color change has been the most evident, leading me to believe that the toxemia was precipitated by the sudden accession of large amounts of endotoxin from the cells of the dead villi. A minor degree of placental necrosis we know can be found in every placenta, we also know that villi break off and enter the maternal blood stream. If the cells in these villi are toxic and the process of death is very gradual the maternal organism may be able to handle the liberated toxin, but if the death of placental cells is massive, the liberated toxins may precipitate a preeclamptic toxemia.

It is in relation to placental necrosis that I believe infection plays its most important role in the production of preeclamptic toxemia, and not primarily from the effects of bacteria and their toxins on the liver and kidney, except in so far as the blood metabolites from a nephritis of infective origin may in themselves be a cause of placental necrosis. I am convinced that infection is one of the most likely causes of placental necrosis. Following any type of focal or general infection you will generally find the placenta laden with areas of focal necrosis. The most usual precursor of preeclamptic toxemia is some form of infection, the common "cold," tonsillitis or sinusitis. Whenever such infection exists one can visualize the placenta as being filled with infarcts. This result does not always occur, any more than rheumatism is sure to follow every infection. Every infection in a pregnant woman should lead one to watch her with increased care for the accession of toxemia. Again and again I have taken women through apparently normal pregnancies, in which at delivery infarction of the placenta was relatively absent, only to have them develop a severe toxemia in a later pregnancy following an infection, and at delivery show a placenta grossly infarcted. These placentae, I believe, were toxic, and I further believe that the placental cells of their previous pregnancies with the same husband may have been toxic, but lack of gross placental necrosis prevented the

liberation of large doses of endotoxin before these placentae were delivered and thus toxemia was avoided. Any measure that will tend to prevent gross placental infarction acts as a prophylactic against preeclamptic toxemia. To this end, all focal infection should be eradicated and the pregnant woman should be cautioned to avoid infection of any nature. If the history or signs lead one to suspect a chronic nephritis, we should work with the internist to keep the blood metabolites as nearly normal as possible.

In examining autopsy reports in conjunction with the history and clinical findings, it seems to me that the late toxemias of pregnancy are of two distinct types or combinations of these types: the pure nephritic type giving a marked rise in total nonprotein nitrogen with increased relative percentage of urea nitrogen and which shows the kidney lesion of chronic glomerular nephritis; and the true preeclamptic type that gives little or no rise in total nonprotein nitrogen with a lowered percentage of urea nitrogen and shows the kidney lesion of the true preeclamptic toxemia.

The pathognomonic lesions of true preeclamptic toxemia in the kidney are such that one could reasonably assume that a total return to normal would not be likely, and thus it is not surprising that toxemic symptoms may follow in subsequent pregnancies if the ovular cells are again toxic, especially if massive placental necrosis occurs.

All obstetricians agree that conscientious prenatal care has markedly reduced the incidence of preeclamptic toxemia, especially the number of serious cases. I have attributed this largely to the elimination of focal infections particularly of the teeth, and to the prevention of general infection, together with a more scientific handling of the diet and the eliminative channels. The frequent examination of the urine, blood-pressure and hemoglobin, to the end that the accession of toxic signs may be noted at the earliest possible moment so that intensive treatment may be instituted immediately, has further accounted for these results. Death from toxemia, however, may not be an evidence of neglect or poor treatment. Apparently some products of conception are so toxic that nothing short of the termination of pregnancy will avail and then it must be added that the termination must be consummated before the vital organs of the mother have suffered irreparable damage. Postpartum eclampsia I believe to be due either to placental elements left in the uterus, or to the breaking

down of villous thrombi in the maternal blood stream which delivery cannot affect.

Toxemic patients from the start should have a non-irritating diet, comparatively low in sodium chloride but sustaining calcium balance and iron content to combat anemia. It should be relatively low in fat and protein and relatively high in carbohydrates. Citrous fruit, vegetables and milk are basic items in this diet with additions as the conditions and the compositions of foods direct. Elimination by bowel, skin and urine should be kept to its highest point of efficiency. Intestinal elimination can be assured by doses of magnesium sulphate, when needed, just sufficient to assure normal evacuation. I do not believe in drastic purgation because it may upset mineral balance and result in much more harm just as in the nonpregnant. The skin should be kept well cleansed and active with warm baths. Plenty of citrous fruit and water will further kidney elimination. In severe forms of toxemia, fluid should be limited, as the fluid status of the maternal cells may enter as a factor in the irritability of the nervous system as McQuarrie has shown in epilepsy in children. Fresh air and rest are as important in the treatment of late toxemia as in the treatment of early toxemia.

If, in spite of treatment, the bloodpressure and amount of albumen rise, our problem is then whether we should allow pregnancy to continue or interrupt it in accordance with certain indications. I am convinced that interference at the proper time saves more babies and more mothers and should limit the amount of damage to the maternal organs, which is a matter of great consideration for the future wellbeing of the mother especially in possible future pregnancies. Experience has directed me to induce labor when in spite of treatment, the albumen in the urine reaches fifty per cent by volume, or when the bloodpressure has remained above 180 mm for two weeks or immediately upon reaching 200 mm, or upon the appearance of eyeground changes or eclampsia. In the large majority of such cases the bag is the best method of inducing labor and delivery can be consummated before eclampsia supervenes and without injury to the soft parts of the mother.

Usually, delivery is followed by a rapid subsidence of symptoms and signs of toxemia. In borderline cases, where the eventual necessity for Cesarean sections has been considered, I believe preeclamptic toxemia should add weight on the side of Cesarean section. Again where the toxemia is developing very rapidly and a long hard cervix makes the likelihood of a long labor

very evident, Cesarean becomes a matter for careful consideration. This operation quickly removes the source of the toxin from the mother, and rapidly removes the baby, thus the latter is not subjected to the deleterious effects of the toxins in the mother during a long labor and it does not run as much chance of asphyxia due to further infarction of the placenta. Cesarean section often results in success in women who have gone in to labor with a live child in several previous pregnancies and lost the child each time during the labor. Again I favor Cesarean section in the late childbearing period, if the cervix and other soft parts are resistant and the likelihood of another pregnancy is small. I should estimate that preeclamptic toxemia should furnish a valid indication in about five per cent of all Cesarean sections properly selected.

At the accession of convulsions, if labor is not in progress, I believe in inducing labor by a bag and using a modified Syrogonoff treatment as an adjuvant, and after the cervix is completely dilated, aiding the delivery, if necessary, by a version or forceps. The patient is given a quarter of a grain of morphine hypodermatically and as soon as it has taken effect the largest Voohees bag that can be introduced is inserted extraovularly. If ether is required for this intervention, it is given. The patient is then put in a dark, well ventilated room and cotton is put in her ears to exclude sound irritation. In one hour from the time of the morphine administration, twenty grains of chloral hydrate is given by bowel, with forty grains of sodium bromid. From then on chloralhydrate and bromid is given every two hours in quantity sufficient to keep the patient quiet. Chloral does not interfere with labor to the extent that morphine does, the child is less frequently difficult to resuscitate, and to my mind chloral and bromids reduce nervous irritability better than morphine. Labor is expedited by attaching a two pound weight to the bag. Nothing further need be done until the bag passes through the cervix. At this time, with a large bag, the cervix is completely dilated and labor may be terminated or not according to indications. If the placenta does not come away or cannot be expressed in one half hour it should be removed manually, if aseptic conditions are perfect, and the inside of the uterus well scraped with the fingers to assure as far as possible that no remains of the placenta are left in the uterus. I believe that getting that placenta out of the uterus is like getting poison out of a stomach. This is apparently not the opinion of those who believe that labor should not be induced.

Except for cardiac indications I never bleed a toxic woman before delivery and seldom find it necessary or expedient after delivery. Bleeding seems to render the convalescence more prolonged probably because of anemia. When bled before delivery, I have seen women die shortly after delivery apparently from loss of blood and shock before a transfusion could be given.

When nature does not, without aid, terminate the toxemia by delivery, it seems to some of us that the main question for us to decide is when and how we should best assist her. Others say that pregnancy should not be interfered with because whatever the toxins, the maternal organism will probably handle them successfully with the aid of drugs. I believe that the conditions should be visualized as a continuous pouring out of toxins by the embryo and the placenta. At the same time portions of the placenta are being killed and the endotoxins of these cells are increasing the toxemia and interfering with the foetal oxygenation, assimilation and excretion through the placenta. In addition, the toxemia of the mother is likely further to affect the child. I believe these pregnancies should be terminated at a time fixed by indications approved by experience, the child freed from the complicated situation and placed in the fresh air where it has a better chance, and the source of the toxin or toxins removed from the mother before irreparable damage has been sustained by her organs.

In the past twenty years we have seen marked improvement in the reduction of incidence of preeclamptic toxemia in the practice of those men and clinics that insist upon meticulous prenatal care. However until we develop an antitoxin or learn how to desensitize, I feel quite certain that we will have preeclamptic toxemia with us, and at times in spite of all precautions and every known refinement of treatment will meet with cases where the toxins are so potent and liberated in such massive quantities that no form of treatment will avail. In their zeal for the development of proper prenatal care and treatment, too many men have given the public the impression, with infinite harm to our profession, that death from toxemia invariably means neglect, poor prenatal care or poor treatment.

## SUMMARY

When the spermatozoon fuses with the ovum, an organism is evolved whose cells may or may not be toxic to the maternal organism. When toxic, it is the exotoxins and endotoxins of these cells that cause the toxemias or pregnancy.

The treatment of light cases of early toxemia (nausea and vomiting) consists of clearing up all areas of focal infection, a high carbohydrate diet, fresh air, attention to elimination, psychotherapy, rest, and bromids to reduce the irritability of the nervous system. More severe cases (hyperemesis) should be confined to bed, food and fluid by mouth interdicted and glucose and water given by retention enemas, proctoclysis or intravenously. When the toxin shows evidence of being very potent, treatment fails and the mother shows little immunity, nothing short of a therapeutic abortion will avail. Indications for therapeutic abortion are found in the pulse, the mental condition, and signs of myelitis.

In regard to late or preeclamptic toxemia, all agencies that will tend to limit infarction or necrosis of the placenta will act as prophylactics against this toxemia. Such agencies are: elimination of focal infection and the protection of the mother from general infection of any type, and if a chronic nephritis exists, a diet that is likely to keep down blood metabolites.

In the treatment of late toxemia, attention to the eliminative channels, high carbohydrate diet, fresh air and rest are as important as they are in early toxemia.

In severe cases, in the interest of both mother and child, the crucial point in treatment is the decision as to when and how the pregnancy should be terminated. If the fetus and placenta are allowed to remain in the uterus too long, overwhelming and irreparable damage may be sustained by the vital organs of the mother; and the fetus may die because of asphyxia and interference with assimilation and elimination due to further infarction of the placenta, or may die from the products of maternal toxemia.

Indications for the termination of pregnancy are found in urine, bloodpressure, eyegrounds, and convulsions.



## Treatment of Secondary Anemia During Pregnancy\*

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THE estimation of hemoglobin during pregnancy reveals a surprising number of patients with anemia. Lyon stated that among a third of 200 patients examined in the third trimester, the concentration of hemoglobin was 70 per cent or less. Similarly, Galloway asserted that the majority of pregnant women are anemic. In approximately a third of the prenatal cases observed at The Mayo Clinic the concentration of hemoglobin is below 71 per cent. In 11 per cent of the cases in which anemia was observed in the last two years, the anemia was apparent in the first trimester, in 42 per cent in the second trimester and in 46 per cent in the third trimester. The degree of anemia prior to treatment averaged 60 per cent in the first trimester, 59 per cent in the second, and 56 per cent in the third. In agreement with Galloway's findings, the highest percentage of cases of anemia occurred in the third trimester and the average hemoglobin content was lowest then. Few patients had severe anemia; in only 14 per cent of those affected was the concentration of hemoglobin 50 per cent or less.

Severe anemia complicating pregnancy is comparatively rare and in practically all cases is of the secondary type. In three cases the concentration of hemoglobin was below 35 per cent. In one of these cases hemolytic or splenic anemia was present, in the other two the anemia was of the secondary type. Pohl quoted Wolff as stating that geographic situation sometimes plays a part in severe cases of anemia. Wolff reported twenty-two cases in 14,400 births in Zurich, only eight cases in 90,000 births in Vienna in thirty years and twenty-seven cases in Parma in three years.

Formerly, many of the severe cases of anemia of pregnancy were classified as true pernicious anemia. However, much of the literature concerning anemia of pregnancy antedates modern hematology, leading to much confusion between "pernicious-like anemia of pregnancy" and "true primary pernicious anemia." Most recent writers employ the term "pernicious-like anemia of pregnancy." Pepper stated that in none of forty undoubted cases of pernicious anemia among women at the University of Pennsylvania Hospital was

there any relationship between pregnancy and the anemia. Osler's report of Cabot's cases of true pernicious anemia in pregnancy is quoted as proof of the concurrence of the two conditions. If the present-day knowledge of morphology of the blood cell had been available, it is a question whether either Cabot or Osler would have classified these cases as examples of true pernicious anemia.

Anemia occurring during pregnancy may be the result of loss of blood, frequent childbearing and complicating conditions, such as pyelonephritis, toxemia, chronic nephritis, puerperal infection, syphilis and tuberculosis. Rarely other types of anemia may complicate pregnancy, such as hemolytic icterus, leukemia, purpura hemorrhagica, aplastic anemia and hemophilia.

However, more or less severe grades of secondary anemia may complicate pregnancy without apparent cause. In other words, there seems to be, in many instances, a direct relationship between the state of pregnancy and the anemia. This has been recognized many years. Many hypotheses of etiology have been advanced; these will not be considered here.† It may be assumed that some toxic factor the result of pregnancy, or some disturbance of physiologic adjustment resulting in inadequate production of erythrocytes is the cause of the anemia.

In a recent article, Mussey, Watkins and Kilroe reviewed the results of a study of the morphologic changes in the blood of eighty-two pregnant women with secondary anemia. They agreed with Kühnel that there seems to be a true anemia of pregnancy. Usually secondary anemia of pregnancy may be classified in two general types: Type I, the semi-aplastic, or bone marrow deficiency type, and type II, the hemoglobin dysfunction or deficiency type. The authors just referred to stated: "Type I anemia in which bone marrow is apparently deficient in activity, is most commonly seen. It is characterized by a moderate reduction in erythrocytes with approximately an equal decrease in hemoglobin. Morphologically, the erythrocytes usually show slight hypochromasia (practically normal,) moderate anisocytosis, and varying degrees of polychromatophilia, depending on the degree of anemia present.

†The reader is referred to Larrabee's excellent classification of various etiologic hypotheses concerning anemia of pregnancy.

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\*\*Section on Obstetrics, The Mayo Clinic.

"In early pregnancy there seems to be suppression in activity of bone marrow, as evidenced by the proportion of reticulated erythrocytes in the blood. In the later months of pregnancy the bone marrow apparently becomes hyperactive. The reticulated erythrocytes increase, yet fail to bring the blood count back to normal. This continued anemia in the later months of pregnancy, in spite of increasing numbers of reticulated erythrocytes, is probably due to some hemolytic agent. That a toxic agent is present is evidenced by the neutrophilic leukocytes, which present varying degrees of toxicity, as shown by the moderate shift to left, swelling of the nucleus, cloudiness of the chromatin, and irregularity in distinction of the specific granulation and intensification of the staining reaction of the individual granules."

There is a tendency for patients with this type of anemia to recover spontaneously after delivery. It is the most common type, and it seems probable that severe cases of this type of secondary anemia make up a large part of the cases which have formerly been termed "pernicious anemia" or "pernicious-like anemia."

"Type II anemia differs from type I in one respect only; the hemoglobin is much more reduced in proportion to the reduction of erythrocytes, resulting in a marked hypochromasia, that is, the hemoglobin deficiency type from the morphologic standpoint. The other features are approximately the same as in type I. Evidence indicates that type II anemia is usually present prior to pregnancy and grows worse during pregnancy. It frequently persists following delivery and usually requires treatment." Occasionally, evidence characteristic of both types is found in the blood cells of a patient.

In a preliminary report, Mussey, Watkins and Kilroe recorded the progress of anemia during pregnancy, first, without treatment, second, following treatment with extract of bone marrow in cases of type I, third, with powdered fetal liver in cases of type II, and fourth, with ferric citrate or ferric ammonium citrate in either type. "The use of organotherapy such as extracts of bone marrow and powdered fetal liver was not followed by appreciable improvement in this group of cases. However, this may have been due to insufficient dosage or inability of the patient to take the product. The use of ferric citrate or ferric ammonium citrate was followed by distinct elevation of hemoglobin in 75 per cent of a small group of cases."

While preparation of the report referred to was in progress, and since its publication, ferric citrate has been used in about seventy additional cases of secondary anemia of pregnancy. An effort

was made to have each patient on a balanced diet, high in vitamin, and certain patients received, also, cod liver oil or a concentrate of cod liver oil. There were three cases of severe anemia; that is, with a concentration of hemoglobin below 35 per cent. One of these cases of splenic anemia gave evidence of progressive anemia; at one time the value for hemoglobin was as low as 30 per cent, and one transfusion of blood was given in the thirty-ninth week of gestation, two transfusions were given during labor, and one was given during the puerperium. The patient's convalescence was uneventful. One patient with secondary anemia had a transfusion at the thirtieth week of gestation. This was followed by ferric citrate, and the concentration of hemoglobin rose to 65 per cent at the time of delivery. The other patient registered in the thirty-seventh week of gestation. Because of pregnancy in a myomatous, partly aneuplastic uterus, abdominal cesarean section was done in the thirty-ninth week, and because of the pre-existing anemia a transfusion of 500 cc. of blood was given immediately following the operation. One patient whose spleen had been removed three years previously for splenic anemia consulted me in the thirty-ninth week of gestation. The concentration of hemoglobin was 56 per cent; an abdominal cesarean section was performed because of pelvic disproportion. Recovery was uneventful.

#### COMMENT

In the cases in which ferric citrate was given, the average concentration of hemoglobin was 52 per cent before medication and 68 per cent afterward. It was found that doses of 10 grains given three times a day were not nearly so effective as 20 to 30 grains three times a day. Doses of 60 or more grains daily may cause diarrhea, or more rarely anorexia. Such symptoms usually disappeared when the dosage was lowered, but in a few instances administration of the drug had to be discontinued because of them. In a group of fourteen selected cases in which at least 20 grains of ferric citrate was given three times a day, with a diet high in vitamin, and usually with cod liver oil concentrate, the average value for hemoglobin after treatment was 80 per cent.

Galloway has called attention to the importance of at least one reading of hemoglobin in each trimester. This is of value, for the percentage of hemoglobin may distinctly drop in the third trimester.

I am convinced that the use of ferric citrate, or ferric ammonium citrate, together with a balanced diet high in vitamins, and addition of Vitamin D in the form of concentrate or viosterol, is of dis-

tinct value in treating secondary anemia of pregnancy. When the value for hemoglobin is less than 40 per cent it may be necessary to resort to transfusion before the concentration of hemoglobin begins to rise.

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## The Diagnosis and Conduct of Labor in Abnormal Presentations of the Head\*

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*St. Paul*

**I**N difficult labor the mother can usually be safely delivered despite the most unfavorable complications, if abnormal conditions are recognized sufficiently early. To do this one should be thoroughly familiar with the more common types of contracted pelvis, especially the flat and generally contracted. Fairly accurate measurements of the distance of the promontory of the sacrum from the symphysis pubis can be made with the fingers; also the transverse diameter can be estimated, and any abnormalities of the ischial spines, the coccyx or narrowing of the pubic arch. At the same time the pelvis should be palpated for possible obstructing uterine or ovarian tumors.

It is advisable to be thoroughly familiar with the landmarks and diameter of the fetal head. This knowledge can be acquired only by examination of many newborn heads. Ability is thus obtained to readily distinguish the quadrangular large from the triangular small fontanelle and the sagittal from the coronal suture.

Early recognition of the ossified (or preossified) head which is hard, unyielding, lacks elasticity is very important. This type of head, although entering the normal pelvis in a favorable position, may, due to its lack of malleability, offer a serious obstacle to the successful termination of labor.

Despite improvement in the technique of measuring the female pelvis (by X-ray and internal pelvimetry), in many instances grave doubts may exist as to whether or not a woman should be given the test of labor. These doubts can be to a great degree removed if one understands Mueller's maneuver. Under deep anaesthesia, if by firm pressure on the fundus, the largest diameter of the fetal head passes through the pelvic inlet, the case can be safely left to nature.

Clinically abnormal presentations of the head may be classified as follows:

1. Deflexion attitudes.
  - (a) Bregmatic presentations or military attitude.
  - (b) brow presentaton.
  - (c) face presentation.
2. Lateral deviation of the head
  - (a) anterior asynclitism (Naegle's obliquity, anterior parietal presentation)
  - (b) Posterior asynclitism (Litzmann's obliquity, posterior parietal presentation.
3. The occipito posterior presentation
  - (a) The bregmato-cotyloid or eccentric occipito posterior
  - (b) The fronto-cotyloid or concentric occipito posterior.

*The median vertex presentation* is recognized by very few American authors. DeLee, however, discusses it quite fully in his text book. This position is frequently confused with the occipito-posterior presentation. Since the head enters the pelvis by its longest diameter, the occipito-frontal, labor is usually slow and markedly prolonged. The important diagnostic point is that the anterior and posterior fontanelles occupy the same level.

Lehle, in 30,914 births, found this position occurring in 1.04 per cent of the cases. He found the duration of labor prolonged five hours beyond the normal in primiparae and two hours in multiparae. The moulding of the head is quite characteristically cone-shaped. The head is greatly lengthened from the forehead upward and backward. This shape offers great resistance to the perineum at birth with resulting prolongation of the second stage of labor. Third degree tears occur frequently. Lehle found severe asphyxia in

\*This paper prepared by invitation for this Special Obstetric Number of The Journal-Lancet.

18 per cent of the infants. Deep episiotomy and low forceps extraction are recommended at the earliest signs of fetal distress.

#### BROW PRESENTATIONS

In brow presentations the head assumes an attitude midway between flexion and extension. Since many of them undergo spontaneous correction, either by flexion into an occiput or conversion into a face by extension, they are probably more common than is generally supposed. The incidence is reported as varying from one in 1000 to one in 2,000.

As in face presentations, any factor which favors extension of the head may give rise to a brow presentation.

If the fetal heart sounds are heard loudest on the same side as the small parts, and the cephalic prominence is on the same side of the mother as the fetal back, one must strongly suspect the presence of a brow or face presentation.

Treatment before labor depends upon the size of the pelvis and of the child's head. Conversion into a vertex or face presentation should be the first consideration.

When labor is well advanced with the membranes intact, the cervix fully dilated, the presenting part directed posteriorly, and the brow above the ischial spines, a version may offer the easiest means of delivery, provided there is no marked disproportion. If the head is transverse, with a normal sized head and normal pelvis, one can wait with perfect equanimity, and leave the course of labor to nature. If the waters have drained away and the head has descended deeply into the pelvis with the brow directed posteriorly, attempts at assisting rotation may be made by pressure of the fingers against brow. If the brow refuses to rotate to the front, perforation may be necessary to save the life of the mother.

In a generally contracted pelvis, with its diameters decreased one and a half to two centimeters, one should seriously consider an elective caesarean section, unless the child is very small.

#### FACE PRESENTATIONS

Face presentations occur about once in every 250 labors. The head is completely extended, the long mento-occipito diameter occupying the superior strait. Face presentations are caused by the same factors as are present in brow presentations.

*Prognosis:* The prognosis in both face and brow presentations is quite favorable, *provided* there is no marked disproportion between the pelvis and fetal head.

With expectant treatment, Thies gives a ma-

ternal mortality of one-half of one per cent, and a fetal mortality of thirteen to seventeen per cent.

Early in labor, if the cervix is dilated 2 centimeters, attempts may be made to change the face to a vertex by pressing upward on the chin through the cervix while the outside hand presses the occiput down; or correction of the face presentation may be attempted by Schatz's maneuver. This consists of placing both hands upon the abdomen. One hand pushes the chest and shoulders of the child towards the fetal back, while the other hand pushes the breach in the opposite direction and downward, thus causing a flexion of the head. Pressure should then be maintained on the fundus for some time until the vertex enters the brim of the pelvis. This maneuver is dangerous if the waters have drained away and the uterus is tightly contracted over the child, for a ruptured uterus may result. Most face presentations can be delivered normally even when the chin is posterior.

In the presence of a sufficiently roomy pelvis, with a dilated or dilatable cervix, the membranes intact, and the presenting part above the ischial spines and immediate delivery necessary, the simplest method of delivery is by a podalic version. However, if seen late in labor, with the head impacted deeply in the pelvis, attempts at reduction are usually futile. One then can only wait for the chin to rotate under the symphysis. Anterior rotation of the chin does not take place until the pelvic floor is markedly distended by the descending face. Labor may then be easily terminated by low forceps combined with an episiotomy.

In the presence of a markedly contracted pelvis, or large head, a caesarean is to be recommended, provided the membranes are intact and the mother has not become infected by too many vaginal examinations.

Much has been written concerning the persistent mento-posterior face presentations. It is readily understandable that the head and shoulders cannot pass through the pelvis simultaneously. Persistent chin posterior is a very rare occurrence. Schauta in 80,000 deliveries never encountered a persistent mento-posterior, and Eberle in 10,000 births saw but one case. In the presence of an irreducible mento-posterior, exhaustion of the mother, tetany of the uterus, or a dead fetus, a craniotomy must be done.

Lateral deviations of the head. The head may enter the pelvis with either the anterior or the posterior parietal bone presenting. The former is known as Naegle's and the latter as Litzmann's obliquity. The chief cause of Naegle's obliquity is a strongly projecting promontory which holds

back the posterior parietal bone. The head enters the pelvis, usually with the anterior fontanelle slightly lower than the posterior. At times the anterior ear can be easily palpated behind the symphysis. Expectancy is the treatment in this condition, as labor usually terminates spontaneously after rotation of the occiput to the front.

In Litzmann's obliquity the posterior parietal bone presents with the sagittal suture lying behind the symphysis. Under the influence of labor, the posterior shoulder is pressed strongly into the pelvis behind the head. This offers considerable obstruction to the progress of labor, and if uncorrected, labor may be markedly prolonged or come to a standstill with the mother in a state of complete exhaustion. Only about twenty-four per cent of these cases deliver spontaneously. If recognized early in labor, the condition may be corrected manually or a podalic version may be required. Twenty per cent of the babies are lost if left to nature. Forceps are practically useless. The application to the obliquely directed head is extremely difficult. Under traction the blades may slip off the head, causing serious injuries to the maternal soft parts as well as to the infant.

#### OCCIPITO POSTERIOR PRESENTATIONS

Occipito-posterior presentations occur with much greater frequency than generally suspected because of failure to make the diagnosis. In 5,488 cases of labor at the Johns Hopkins Hospital, Williams found the occiput presenting posteriorly in 11.3 per cent of the cases. He states that if the cases had been examined earlier in labor, the number would probably have been twice as great. The head enters the pelvis with the occiput directed posteriorly to the right or in the proportion of about five to two.

At the beginning of labor there are two types: (a) In the larger group (97 per cent, Varnier) the head is well flexed and the posterior fontanelle occupies a lower level than the anterior and meets the resistance of the pelvic floor first, which causes the occiput to rotate anteriorly under the symphysis through an arc of 135 degrees.

(b) In a smaller group, with the occiput directed posteriorly, the head enters the pelvis with the anterior fontanelle a lower level than the posterior, and meeting the resistance of the pelvic floor first causes the face to rotate anteriorly under the symphysis. Thus the occiput comes to occupy the hollow of the sacrum, sometimes designated as the occiput sacral posterior. Rotation may cease with the sagittal suture transverse to the pelvis, "deep transverse arrest." Moulding causes the head to assume the shape of a cone, which further

hinders rotation. The scalp as well as the maternal soft parts become markedly edematous, with resulting impaction of the head. Progress of labor often comes to a standstill and unless terminated, the mother may become exhausted, the uterus may go into a state of tetany and rupture or pains may cease and the baby may die.

*Diagnosis:* When the small parts are distinctly palpated in the region of the umbilicus, one should strongly suspect an occipito posterior position. There is a distinct hollow over the symphysis, the anterior shoulder can be felt far back of the midline and the forehead can usually be palpated over the opposite pubis ramus. Quite frequently the forehead can be felt to disappear down behind the pubis as labor progresses. The point of maximum intensity of the fetal heart tones is not to be trusted in determining the diagnosis.

The cause of the occipito-posterior position is not clearly understood. It occurs frequently in flat or generally contracted pelvis which adds greatly to the seriousness of the condition. Thoms thinks that a shortening of the transverse diameter of the inlet plays a major role.

*Treatment:* Naegele showed that the vast majority of occipito-posteriors rotated anteriorly followed by spontaneous birth. Varnier found that even in the supposedly very unfavorable sacral posterior positions thirty of thirty-five cases delivered unaided. If the head descends into the pelvis well flexed with the posterior fontanelle in advance, the case may be left to nature, provided there is no disproportion between the head and the pelvis. However, when the head remains above the brim of the pelvis, refuses to flex sufficiently to advance, the cervix is fully dilated or dilatable and membranes are intact, version should be seriously done. Exhaustion of the mother or approaching intra uterine asphyxia of the child may compel operative interference. Version is contra-indicated if the amniotic fluid has drained away and the uterus is tightly clamped over the body of the child. Cesarean section at this time is not to be considered.

In occipito-posterior positions, the head rarely fits well into the cervix, leading frequently to an early rupture of the membranes. The external os is usually eccentrically situated and dilates slowly and the pains are weak and accomplish little. The patient may become exhausted long before complete dilatation of the cervix is accomplished. It must be remembered that the delivery of an occipito-posterior position requires time as well as great uterine and abdominal effort even after complete dilatation of the cervix. Therefore, two of the prime requisites are rest and food. Rest is

best obtained by giving sodium amytal in three grain doses by mouth at five-minute intervals until nine or 12 grams are administered. In primiparae this may be supplemented by one-fourth grain of morphin sulphate hypodermically which can be repeated only once in five or six hours. In multiparae, due to the danger of asphyxia because the baby may be born too soon after giving morphine, three ounces of ether combined with olive oil can be administered rectally instead of morphine. Sodium amytal usually does not slow the uterine contractions and the cervix seems to soften and dilate more quickly after its administration (Dodek). Food is exceedingly important in long labors. It may be given in the form of sweetened orange or other fruit juice, which, if given cold, is greatly relished by the patient.

After complete dilatation of the cervix and rupture of the membranes, the patient may be urged to bear down. If the patient is exhausted, labor may be terminated easily with low forceps. In sacro-posteriors, the head is usually slow in reaching the pelvic floor, and an episiotomy may be necessary to prevent a third degree laceration. Very often the head becomes arrested with the sagittal suture running transversely across the pelvis, the so-called deep transverse arrest. Attempts at reduction manually occasionally succeed. Manual rotation usually fails because the head, due to its moulding, slips back to its original position as soon as the hand is removed. To obviate this, DeLee seizes the scalp with bullet forceps after manual rotation of the occiput to the front, thus holding the head in the desired position while the forceps blades are applied. By traction on the forceps the head is fixed in the pelvis with the occiput anterior. The blades may be removed and delivery left to nature if too much effort is necessary to secure descent of the head.

Williams recommends Tarnier's axis traction forceps in arrested or persistent occiput posteriors. He applies the blades with the pelvic curve toward the face of the child. In making traction, he sweeps the handles through a wide arc (Scanzoïn maneuver). When the occiput is brought to the front, the blades are removed and reapplied as in anterior presentations. Bill, of Cleveland, uses the solid bladed forceps with a somewhat similar procedure differing in that he pushes the head up and rotates before making traction.

Despite the enthusiasm of Bill and others for mid or high forceps in the so-called persistent occiput-posteriors, the writer has found that if left to nature, in 99 per cent of the cases the head will come down to the vulva. In 97 per cent, the

occiput will be found to have rotated anteriorly unassisted. In about two per cent of the cases the occiput rotates posteriorly. In barely one per cent of the cases is any interference such as manual rotation or high forceps application necessary. In 221 occipito-posterior presentations, the writer has found high forceps necessary in one case only.

#### CONCLUSIONS

1. The pregnant woman can be safely delivered if abnormal conditions are recognized sufficiently early in labor.

2. The hand is an excellent means for measuring the pelvis.

3. One should become familiar with the landmarks and diameters of the newborn head.

4. The preossified head is frequently a serious obstacle to the successful termination of labor.

5. Muller's maneuver is an excellent method of deciding whether or not the head will enter the pelvis.

6. Persistent mento-posterior, face and brow presentations are not common.

7. The rotation of the head to the front in face and brow presentations, occurs very late in labor, when the head is on the pelvic floor.

8. Lateral deviation of the head with the posterior parietal bone presenting (Litzmann's Obliquity) may cause a severe dystocia.

9. Occiput posterior presentations are more common than generally suspected, occurring in nearly twenty-five per cent of all labors. The ratio of the right occiput posterior to the left, is about five to two.

10. Clinically two types of the occiput posterior are recognized: Those which rotate anteriorly and those which rotate to the hollow of the sacrum.

11. An occiput posterior presentation is not an indication for Cesarean Section.

12. Labor is usually prolonged. The patient should be rested and fed.

13. A deep episiotomy usually renders the delivery of a persistent sacral posterior extremely easy.

14. The writer has found that if left to nature the head in 99 per cent of the cases will come down to the vulva. In 97 per cent the occiput will be found to have rotated anteriorly unassisted. In about two per cent of the cases the occiput rotates posteriorly. In barely one per cent of the cases is any interference necessary, for example, manual rotation or high forceps application. In 221 occipito-posterior presentations, the writer has found high forceps necessary in one case only.

## Version and Breach Extractions\*

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*Duluth*

THE methods of delivery of the breach presentation and the methods of performing versions have during the past ten years undergone such marked changes that they are deserving of particular consideration at the hands of those doing obstetrics, whether they be specialists in obstetrics or in general practice.

It is admitted that many breach presentations can by external manipulation be converted into a head presentation. This maneuver requires considerable skill and is not always successful, so that breach presentations come to delivery in about three per cent of all cases.

Statistics from large maternity services show an infant mortality varying between one and one-half to four per cent for breach labors, and in general practice may be conservatively estimated at at least 15 per cent—a rate all too high in the light of our more modern methods of delivering these cases.

The death of the foetus in a breach presentation may be due to asphyxia, compression of the cord, intracranial hemorrhages, hemorrhages into the spleen or suprarenals, but by far the greater number are due to tentorial tears. Other injuries that may occur from the careless handling of these cases are fractures of the thigh, hip, clavicle, arm (usually the humerus), jaw and injuries to the brachial plexus with its resulting Erb's paralysis, and many other, but those mentioned comprise the most common ones.

A review of the literature on the subject of breach extractions convinces me that the proper method of handling this type of case merits serious consideration. I believe that all frank breach, knee and foot presentations should be, when the cervix is sufficiently dilated or dilatable, converted into a footling, and after kneading out the perineum be delivered under deep anesthesia by the same procedure as advocated by Potter he has done a version.

The technique of version has undergone such a marked change because of the vast experience of Potter that any attempt at other procedures ranks one as not being skilled in this maneuver. Yet, in our observation, it is appalling to witness versions too often done or attempted by antiquated methods.

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The indications for version have run a wide range within the past ten years. Speaking for one who has run the gauntlet, these indications become less numerous as time goes on. I cannot subscribe to the theory that obstetrical practice is composed of two measures, namely, version or Caesarian section. However, there are certain definite indications for version with breach extraction, and the adoption of the principles of the maneuver as laid down by Potter cannot be praised too highly. The indications are positive in transverse, oblique or shoulder presentations sometimes when face or brow present and in certain occiput (especially persistent posterior occiput) presentation, prolapse of the cord and in some cases of placenta praevia. The head must be floating or capable of being elevated to that position. It is fully recognized that one's obstetrical judgment must tell him when cases are invariably to be treated by version if the above mentioned malpositions are to be delivered.

I wish to emphasize certain very essential things that Potter has taught me, and the wisdom of which my own experience has borne out:

1. A version should never be attempted unless the cervix is fully dilated or dilatable.

2. The use of deep anesthesia, best in the average hands obtained by the use of ether. If one is versed in the technique of spinal anesthesia it will be found a safe procedure, which allows perfect relaxation. Chloroform in the average hands is not safe or reliable, and nitrous oxide or ethylene do not allow ideal relaxation.

3. The use of elbow length rubber gloves is preferable but not essential, and you may use any hand you wish in doing the version. The old teaching of introducing the right or left hand, depending on the position of the foetal back, is not necessary.

4. The free use of sterile green soap and a careful and painstaking kneading of the perineum will be of great help not only in the ease with which the version may be done but also in the delivery of the aftercoming head.

5. It is preferable not to rupture the membranes until you have introduced your hand into the uterus. If the membranes have been ruptured for some hours and fluids have drained off, the difficulty of the version is increased in direct pro-

portion to the length of time membranes have been ruptured.

6. In order to prevent extension of an arm before version it is advisable to cross the foetal arms upon the chest.

7. Always grasp both feet and gently bring them down and version will be easily accomplished.

8. Always delivering the buttocks posteriorly; then by a gentle rotation maneuver the buttocks are rotated anteriorly and the delivery is accomplished in this position.

9. The shoulder should always deliver anterior, using care to deliver the shoulder and arm by a forward motion under the scapula—never by hooking the finger over the shoulder or clavicle, because of the danger of overstretching or injuring the brachial plexus. The posterior shoulder should then be rotated anteriorly and delivered in the same manner.

10. The aftercoming head should be delivered by a bi-manual maneuver; the index finger of the right hand in the foetal mouth and the foetus astride the right arm, the left hand on abdomen, then slowly and gently direct the pressure downward, guiding the extension and the delivery of the head. The fingers in the foetal mouth are to

be used as a guide and not for traction. It is exceedingly important that the delivery of the head should not be *rapid*.

11. If you have difficulty in delivering the head the use of forceps, preferably Piper's aftercoming head forceps is one of the greatest contributions we have to obstetrical paraphernalia.

12. Do not overextend the body on the head for fear of breaking the cervical vertebra.

13. Potter says a white baby needs attention, but a blue one can be laid aside and it will cry without effort at resuscitation.

14. Don't be in a hurry! This last lesson (the 14th lesson) is the hardest one to learn.

Observation of these cardinal principles, which are so far superior to any other methods, and are so applicable to the breach case, and if and when a version is indicated, that I recommend it for your consideration. Obstetrics owes a debt of gratitude to Potter for the development of a technique for the performing of versions. Whether or not you agree with his indications, I feel that the foetal mortality and the foetal morbidity, with attending injury, will be materially reduced by the observation of these simple rules, and will add a new chapter to obstetrical surgery.

## Obstetric Hemorrhage\*

A. L. McDONALD, M.D.

*Duluth*

**H**EMORRHAGE at any time during pregnancy is always abnormal and indicates some pathological condition. If the history or physical findings leave any doubt of the existence of pregnancy the question can now be settled within a few days by the Aschheim-Zondek test.

### EARLY HEMORRHAGES

As soon as pregnancy is established decidual formation begins. This is maintained by a delicate balance of the internal secretions, particularly the thyroid and anterior pituitary in which "Prolan B" dominates. This equilibrium inhibits uterine bleeding throughout gestation. In certain cases of glandular deficiency, thyroid or pituitary (Prolan B) we may find uterine bleeding. This will vary in amount and periodicity, but is most frequent at about the expected menstrual dates. This phenomenon may explain the claim

of some women that they menstruate throughout their pregnancy. This type of bleeding usually is not accompanied by severe pain, though it otherwise suggests and may predispose to a threatened abortion. It may be an indication of thyroid or pituitary deficiency. In the past I have often controlled this situation by the use of thyroid extract, but "Prolan B" may also be indicated.

Other forms of uterine bleeding during pregnancy are due to some disturbance in placental attachment. If of slight consequence, the condition may subside and the pregnancy continue to term. Often, however, the bleeding will continue till placental separation is complete and the placenta has been expelled.

### EXTRA-UTERINE PREGNANCY

Ectopic pregnancy is usually characterized by uterine bleeding. External bleeding begins with disturbance of the implantation of the ovum in

\*This paper prepared by invitation for this Special Obstetric Number of The Journal-Lancet.

the tube, early in ectopic pregnancy or before that condition is actually suspected, and continues as long as any attachment is maintained. It is less in amount than that associated with abortion, is usually unaccompanied by clots or formed debris. Exploration of the uterine cavity discloses only thickened endometrium or a decidual cast. Curetings contain decidual cells, but no placental villi. Pain is unilateral and does not suggest uterine colic. There is a history or evidence of some abdominal disturbance or crisis, possibly of internal hemorrhage or shoulder pain.

Examination demonstrates a closed cervix, uterus only slightly enlarged, a tender mass in the adnexa or tenderness in the cul-de-sac. Many of these cases are treated as uterine abortion until the correct diagnosis is forced by dramatic complication, simply because the possibility of ectopic pregnancy has not been considered. As soon as ectopic pregnancy is diagnosed its surgical removal is urgently indicated.

#### ABORTION

Some twenty per cent of all uterine pregnancies terminate in spontaneous abortion, being the most common cause of obstetric hemorrhage. When the bleeding is only slight in amount, is unaccompanied by severe or unusual pain, and without the passage of large clots or formed debris, expectant treatment (rest in bed, sedatives and hypnotics) is indicated. While no precise limits can be set, excessive bleeding is evidence that abortion is inevitable or imminent. All clots and material passed should be saved for inspection.

Demonstration of the complete sac with the placenta, or of these structures separately, is evidence that the process is complete. This occurs in the majority of early spontaneous abortions, and treatment may then be limited to adequate rest together with ergot or tonics to insure complete involution of the uterus. Vaginal or uterine packing as done in the home, without anesthesia is of little value unless the bleeding is dangerous, and adds material risk of contamination and sepsis. Local measures usually should be withheld until one is forced to complete the abortion, and is prepared to do so under proper surgical environment, with anesthesia. The procedure can usually be carried out at one sitting preferably with the finger or with instruments as may be indicated. Post-operative uterine packing is only used to control hemorrhage.

The sole indication for mechanical evacuation of the uterus is hemorrhage, either profuse or repeated, to an extent incompatible with spontaneous completion of the abortion. While the bleeding is alarming to the patient or her family,

rarely does it threaten life or justify the neglect of rigid surgical precautions, or of the serious contra-indications to operative treatment. Continued or repeated bleeding may, however, lead to serious anemia, predispose to sepsis and prevent proper involution of the uterus. It indicates an incomplete process and requires curettage followed by rest and tonic medication.

Positive contra-indication is actual or probable infection of the uterine cavity, as may be indicated by fever or chills. Also the history or even suspicion of previous intra-uterine manipulation, either criminal or therapeutic, adds materially to such risk. The unknown case should, if possible, have sufficient observation to exclude active sepsis or to place the operator on his guard.

In the known absence of contra-indications, emptying the uterus under anesthesia enables the physician to control the situation and insures a prompt and uncomplicated convalescence. Material obtained by curettage or that passed spontaneously must be preserved and examined: First, to prove that the process is complete. Second, that the condition was actually a uterine pregnancy, by the demonstration of placental villi in the debris, and Third, to recognize the presence of abnormal conditions, hydatid mole or chorionepithelioma. The latter conditions are rare, but may occur at any time in anyone's practice.

#### HYDATIDIFORM MOLE

Hydatid mole is suspected from somewhat characteristic findings; a uterus larger than can be accounted for by the known duration of the pregnancy, continued or repeated bleeding and is confirmed by passage of characteristic vesicles or by evacuation of the uterus and identification of the "mole." This usually controls the situation. Microscopic study of the curetings may demonstrate the presence of the more serious malignant chorio-epithelioma, or this will be suspected by continued or repeated bleeding or the presence of recurrent growths, either locally or in the lungs. Treatment will then consist of panhysterectomy followed by deep X-ray therapy which has a favorable influence on these embryonic structures.

#### LATE HEMORRHAGES

Bleeding later in pregnancy is due to disturbance in placental attachment, and is a threat of impending labor, either premature or full-term. Two types are recognized.

#### OBLATIO PLACENTAE

Concealed hemorrhage into the uterine or amniotic cavity may reach serious proportions before there is evidence of external bleeding. The condition is due to premature separation of a normally

situated placenta—so-called “Ablatio Placentae.” Causes include certain types of toxemia and possibly trauma. The condition often occurs suddenly and without warning. It is evidenced by severe pain, shock, signs of internal bleeding or increase in the size of the uterus which is rigid and board-like. Fetal heart tones cannot be heard, and one can not palpate the fetal small parts, or demonstrate ballotment. The wall of the uterus rapidly becomes infiltrated with blood and loses its “tone” because of this and also the extreme overdistension. Normal retraction and contraction are therefore no longer possible, and delivery is likely to be followed by severe post-partum hemorrhage which is difficult or impossible to control. For this reason any type of vaginal delivery is hazardous. The procedure of choice is abdominal section in the interests of the mother, since the fetus is often premature or already dead. In case of doubt as to the condition of the uterus, hysterectomy is advised.

#### PLACENTA PREVIA

Painless hemorrhage of any consequence usually is due to a low or vicious insertion of the placenta, some type of placenta previa. The bleeding will vary from repeated small amounts to a single profuse soaking hemorrhage. It usually occurs before there is evidence of impending labor, and always raises the question of that most serious complication, placenta previa. The patient should immediately be brought into a hospital or a suitable environment for surgical delivery, before any vaginal examination or manipulation is undertaken. What is begun as a simple diagnostic procedure, or possibly packing of the vagina, may easily lead to dangers out of all proportion to any good which could be accomplished. The cervix is highly vascular and friable. Manual or rapid dilation is likely to lead to laceration extending into the placental site and cause fatal hemorrhage. Even normal delivery or the expulsion of a bag may have the same effect. The patient has already lost a great deal of blood and a moderate post-partum hemorrhage may be fatal. One must be prepared to treat shock and hemorrhage by blood transfusion or acacia solution intravenously. Such preparations must be made before any operative delivery is undertaken. Glucose or saline solutions have no lasting effect in maintaining blood pressure if the bleeding continues.

In the simpler cases where the placental insertion is only marginal, with bulging membrane, and labor is already progressing, rupture of the membranes will allow the presenting fetal pole to descend and control bleeding until spontaneous

delivery occurs. In such cases a really “watchful waiting” will allow one to meet any emergency.

In other instances the insertion of the placenta is such that a suitable bag of the Voorhees type will control the situation safely. Under such conditions labor will progress, but must be closely watched by the physician. When the bag is expelled one must be prepared for a rapid termination and be prepared to meet any emergency which may arise.

The cause of the most disastrous hemorrhage lies in the condition of the cervix at the placental site and in the effect of trauma incident to dilatation and delivery. Postpartum hemorrhage is often rapidly fatal and is difficult or impossible to control. In order to avoid this complication, abdominal cesarean section offers a most happy solution of the problem. It is chosen in the interests of the mother in cases of central placenta previa, in primiparas, and other selected cases. The selection of the proper method of delivery calls for the keenest obstetric judgment and must be made before any vaginal manipulation is undertaken which will introduce additional hazards of infection or increased bleeding.

#### POSTPARTUM HEMORRHAGE

Post-partum hemorrhage of serious proportions may occur during or very soon after the third stage of labor. It is best avoided by allowing a physiologic third stage. If continuous, and occurring during uterine contraction, aseptic examination of the cervix and genital tract must be made at once and all lacerations repaired. If, in the face of serious hemorrhage, there is atony of the uterus, or a definite delay in expulsion of the placenta, or there is reason to suspect a retention of part of the secundines, aseptic manual exploration of the uterus is necessary. While this procedure is a serious one and not to be undertaken lightly, it is probably safer at this time than at any later period. In some instances the situation can only be controlled by a thorough packing of the uterus and vagina. In the vast majority of cases, however, expulsion of the placenta is spontaneous, and even severe bleeding is satisfactorily controlled by proper uterine massage, and the use of pituitrin or ergot preparations hypodermically. In all cases of prolonged labor or of serious surgical delivery the operator must be prepared to combat shock and collapse. If suitable donors are immediately available, transfusion is definitely indicated. As is often the case matched donors are not at hand, and intravenous injection of acacia or glucose solutions are really life-saving and will maintain adequate blood pressure.

## HEMORRHAGE DUE TO INFECTION

Severe or repeated hemorrhage later in the puerperium are most often associated with uterine sepsis. Any intra-uterine manipulation is extremely dangerous since it is likely to cause extension of the septic process. Moreover, this type of postpartum bleeding is rarely due to retention of sec-

undines. In these cases dependence must be placed in measures to combat the infection, raise the patient's resistance, and overcome the anemia which is due rather to sepsis than bleeding. Repeated blood transfusions, if possible using blood from immunized individuals, have great value. Local measures are positively contra-indicated.

## Postpartum Care and Complications\*

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*Duluth*

FOR THE last twenty years there has been a great deal of agitation both in and out of the Medical Profession in favor of more and better pre-natal care. There are pre-natal clinics in every city, county nurses in rural districts and every effort is being made to bring the pregnant woman to her confinement in as good a condition as is possible. Pre-natal care has had a very striking effect in reducing the number of cases of toxemia, the number of stillbirths, and certain accidents of labor.

The same may be said of baby clinics where free advice is given to mothers of young babies and the child is supervised in regard to its food, clothing, fresh air, etc. These clinics are found in every community, usually directed by a lay organization with the medical profession doing the actual work without remuneration.

It seems to me that there is a time in between pre-natal care and the baby clinic actively, namely, the postpartum condition, which has not received the attention it deserves. Perhaps it would be wise for the medical profession to give more care to this phase of the matter lest the lay organizations take this in hand also.

Post partum care is just as important as pre-natal care. Proper attention at this time will have a tremendous influence on the future health and comfort of both mother and child. Disturbance of the bladder with annoying frequency of urination, displacement of the uterus with its attendant pelvic congestion, anal fissure, erosion and infection of the cervix resulting in tenderness of the sacro-uterine ligaments are conditions of great importance and if not corrected may last a lifetime.

It is conceded that the delivery room is the ideal place to prevent post-partum complications. A great deal can be done but not all deliveries

are ideal; even in the best equipped maternities lacerations will occur, forceps must be used, stretching of the supports of the uterus do take place and mild infections are encountered in spite of every effort to prevent them. Painstaking and often prolonged treatment will do much to avert the unsatisfactory results so often seen as a result of parturition.

After the delivery of a difficult case the tendency is to do nothing further. The woman is relieved of a nine-months' burden, she does not usually complain much and if she does the doctor reassures her with the statement that the trouble will soon pass away. When she returns for her six-weeks examination, if she returns at all, the doctor is often loath to tell her that she has a retroversion or a laceration of her cervix for fear that he will be held to blame for the condition. Conditions drift along until the retroversion becomes permanent and the slight laceration results in a chronic infection, erosion and cystic degeneration of the uterine cervix.

This is a mistake. The patient will welcome a discussion of her condition, and the statement that one or two conditions need attention before she is discharged will not be taken amiss.

The patient's first complaint is usually "after pains." These are simply contractions of the uterus which is trying to expel blood clots. The best preventative in my opinion is gentleness in expressing her placenta and small doses of ergot during the first thirty hours. The best treatment is a small dose of morphine or dram doses of paregoric by mouth with ergot.

The next complaint is often urinary retention caused by a neurotic condition or temporary paralysis of the bladder. I believe that this should be treated by early catheterization. The danger of infection is much greater if a bladder becomes distended and the blood supply has become im-

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paired and the mucosa injured than it is when a bladder is catheterized early and not permitted to become distended. If cystitis does occur, it should be treated with hexamethyleamin, large quantities of water and irrigation of the bladder in the severer cases. A cystitis causes much local discomfort but slight fever. A pyelitis causes a high fever but usually not so much local discomfort.

Next comes the question of fever. We regard a temperature of over 100 degrees as an indication of an infection. I do not believe that the establishment of lactation is normally accompanied by a rise in temperature to over 100 degrees. An effort should be made to rule out any intercurrent infection such as of the respiratory or urinary tracts. A catheterized specimen of urine should be examined for pus which would indicate a urinary infection. A patient may have a severe pyelitis and make very little complaint of bladder symptoms. If pyelitis is diagnosed, the treatment should consist of forced fluids, hexamethyleamin and acid sodium phosphate or pyridium. They generally clear up rather promptly but an occasional case may need to have the kidney pelvis lavaged.

In case the extra-pelvic causes of fever can be ruled out and the temperature goes higher the case is probably one of puerperal sepsis. The following procedure may be carried out: Small doses of ergot are given to keep the uterus contracted, an ice bag is placed over the lower abdomen, a leucocyte count and hemoglobin estimates are made and a watchful waiting policy pursued. No local treatment, such as vaginal douches, intra-uterine irrigations or curettage should be attempted; they are distinctly harmful and should be avoided. They may convert a mild infection into a severe one and favor the dissemination of the infection into the blood stream. The one exception to this rule is when there is considerable and persistent bleeding, in which case the interior of the uterus may be explored with the finger or large dull curette and any retained placenta removed.

The sutures should be inspected, if there appears to be infection around them they should be removed. If the infection assumes a threatening character, accompanied by chills and high fever, further measures are in order. My procedure is somewhat as follows: Give 50 to 100 cc. of polyvalent antistreptococcic serum intravenously every six or eight hours for three or four doses and continue it if improvement occurs. Intravenous glucose is very valuable as a supportive measure and may be given 1000 cc of 10 per cent solution slowly twice daily.

The most valuable treatment of all in my experience, if facilities are available, is blood transfusions of 300 to 400 cubic centimeters at two or three-day intervals by the citrate method or better still by the direct method. Cases with a positive blood culture do not give as good a prognosis as do those with a negative culture, but recoveries do occur in spite of a positive culture.

The formation of a large induration in the parametrium is rather a favorable omen and indicates the localization of the process. These cases usually recover and in my experiences rarely go on to abscess formation. The only surgical procedure indicated in puerperal sepsis is the drainage of a well defined localized abscess.

Fevers manifesting themselves during the second week are usually pyelitis, phlebitis or breast abscess. Phlebitis should be treated by elevating the leg on pillows, hot applications and general supportive measures. They usually recover after some weeks and do not usually form an abscess or throw off emboli into the blood stream. The circulation may be impaired for some months but complete recovery usually ensues.

Engorgement of the breast is treated by the breast support and ice bags and by a breast pump if necessary. Cracked nipples is a most annoying condition and its prophylaxis not entirely satisfactory. The best prophylaxis is simply to have the patient massage and pull out the nipples with the fingers every night during the last months of pregnancy. This toughens the skin better than any lotion and gets the nipple used to being manipulated.

If the crack is once established, scrupulous asepsis must be carried out to prevent breast abscess. As a local application we have had as good results with the old-fashioned bismuth, balsam of Peru and castor oil as with any other treatment. Application of five per cent silver nitrate solution once daily serves to hasten healing as does also violet-ray treatment. However, it is often necessary to take the baby off the breast for three or four days to allow the cracks to heal, meanwhile expressing the breasts or using the breast pump.

On discharge of the patient from the hospital, instructions are given to continue the knee-chest position, which has been started on the seventh day, for five minutes morning and night until her return for post-partum examination at six or seven weeks. She is warned not to take douches; she may take a tub bath three or four weeks after the birth of the baby. She is warned to go to bed on the occurrence of an increase of

bloody discharge or the development of a heavy bearing down feeling in the pelvis. She is warned about constipation which is often acquired in the hospital and told of the necessity of cultivating a regular time for the bowel movement.

At the six weeks' examination inquiry is made as to bloody discharge which has usually stopped, backache, bearing down feeling, bladder irritability and constipation. A considerable number of patients will have one or more of these complaints. Many women assume their regular duties too soon. If it is the first child they worry a lot about the baby, lose a great deal of sleep and so complain of being tired even if there is no definite pathology present.

A careful complete examination should be made, including lungs and heart, the condition of the blood, the urine and blood pressure. The condition of the abdominal walls should be examined. Vaginal examination should note the healing of lacerations, relaxation of the perineum, character of discharge, cystocele or rectocele if present, the size and position of the uterus, the condition of the cervix and also the condition of the anus and rectum. The breasts should be examined, most abscesses of the breast develop after the patient leaves the hospital.

The treatment of these complications may include the following: Exercises should be prescribed for the relaxation of the abdominal walls, such as raising the legs to a perpendicular with the knees stiff, while lying on the back with the hands clasped behind the head. Contracting the levator ani at the same time raising the hips off the bed will aid in correcting relaxation of the perineum. Granulating tender areas around the healing lacerations may be treated with the silver nitrate stick. Episiotomy scars sometimes remain tender longer than do ordinary tears. Slight erosions of the cervix which are often present

should be treated with the cautery. Small lacerations of the cervix should be striped with the cautery to draw the lips in as the scar contracts.

If subinvolution and posterior displacement be present the patient must continue the knee-chest and monkey walk and small doses of ergot given. If the uterus can be replaced easily a pessary should be fitted but if involution is greatly retarded and the uterus is large and flabby, a pessary will probably not hold it in position at this time and another attempt should be made two or three weeks later.

Fissure in ano is very annoying, small cracks may be treated with ten per cent silver nitrate preceded by cocain, repeated at intervals. The more intractable ones may be incised in the office under local anesthesia and some cases require a complete dilatation of the anus under general or caudal anesthesia with deep incision of the fissure.

Some patients gain in weight after childbearing due to the fact that they are under the impression that they must drink milk, cocoa and eat rich foods in order to keep up the milk supply. This is not necessary. A properly balanced diet is much better, including plenty of green vegetables and a moderate amount of protein food together with some outdoor exercise will do more for the milk supply than overeating with rich carbohydrate foods.

All this may seem like a lot of trouble for the doctor to take in an ordinary confinement case and the objection may be offered that the attendant cannot afford to do all this work for the usual obstetrical fee. This is very true but until this sort of work and attention to detail is put into effect the fee for obstetrical work will never be raised to its proper level. We must educate the public to the appreciation of the fact that proper obstetrical work is entitled to adequate pay.

## The Heart in Pregnancy\*

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**H**EART disease has long been looked upon, in many of its manifestations, as a contraindication to pregnancy, and when pregnancy occurred, as an indication often for its interruption.

The problem of the estimation of heart function, and the conservation of heart capacity, has

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interested the writer for many years. Service in the University Hospital since its establishment, as well as close association with the Professor of Obstetrics at the University of Minnesota, has afforded an opportunity for the observation of a very considerable number of cases of functional and organic disturbances in the circulatory apparatus in pregnant women.

The first comprehensive study of the heart in pregnancy was by Larcher, an interne in the Paris Maternity Hospital, in 1825. He thought that the heart, particularly the left ventricle, normally enlarged during gestation and was reduced again in the lactation period. Angus MacDonald, in 1878, maintained that Larcher exaggerated this cardiac hypertrophy in pregnancy.

In recent years the more modern methods of study of the heart and circulation, show that in pregnancy the work of the heart is definitely increased.

Gammeltoft<sup>1</sup> states that there is an increase in the volume of blood propelled by the heart per minute due either to enlargement of the vascular system of the uterus, or to an increase of the total volume of the maternal blood; whichever explanation is correct, this increase of minute volume involves an increase of heart action. He studied 118 cases of pregnancy without any cardiac disturbance. Using the X-ray silhouette he found definite increase in the longitudinal and transverse diameters of the heart in 23 of his 118 cases as early as the fourth or fifth month. In the sixth and seventh months the diameter increase became more pronounced, the longitudinal diameter was found increased in 39 cases and the transverse diameter in 33. In the eighth or ninth month the longitudinal diameter appeared to increase in 67 of the cases; i. e. in 56 per cent, but no significance could be attached to these later determinations because the diaphragm by then was pushed upward and modified the position of the heart, thus vitiating the measurements. In the earlier months, however, this could not be the explanation. Examined two to four weeks postpartum, all of these patients showed the diameters again normal. He thinks, then, that the heart diameters can be shown to be increased in a stage of pregnancy when the upward pressure of the diaphragm is as yet of no consequence.

Studying the electrocardiographic tracings of these patients, Gammeltoft thinks that the changes indicate that the left ventricle undergoes hypertrophy in the first six months of pregnancy and in the last months of pregnancy there is a proportionate hypertrophy of the right ventricle. These electrocardiographic changes can often be demonstrated for a whole month after labor, indicating that they are not due solely to a change in axis of the heart, and that the heart muscle really does undergo some change.

Jensen and Norgaard,<sup>2</sup> reporting more in detail from Gammeltoft's clinic, state that there is an essential cardiac hypertrophy during preg-

nancy and in 60 per cent there is also a dilatation. It would seem, then, that there is today strong evidence that there are changes in circulation which involve an increase in stroke volume and in minute volume of the heart output and that in many instances hypertrophy, and even dilatation of one or both ventricles, can be demonstrated in normal individuals.

The demonstration of slight edema and latent edema, at a time when it is not believed that the growing uterus can cause it, by Kaufmann,<sup>3</sup> and by Holtermann,<sup>4</sup> add strong confirmation to the evidences of definite circulatory change, whatever its character.

Klaften and Palugyay<sup>5</sup> in the University Frauenklinik in Vienna, by comparative studies on the position and distension of the heart and lungs in pregnancy, demonstrated the wide variations which different individuals show. These depend in part upon the size and position of the products of conception, but in still greater degree on the constitution and habitus of the woman and thus also on the space relations in the thorax, and in primiparae also on the resistance of the abdominal musculature. They show, along with the almost constant raising of the diaphragm shadow, an elevation of the heart in toto. The heart shadow may be dislocated to the left, particularly by elevation of the right half of the diaphragm more than the left, or, with elevation of the right half alone when, as seems to be the rule, the central tendon of the diaphragm is incapable of corresponding elevation, the apex of the heart may even become dislocated downward instead of upward.

Stress has been laid in this discussion on the changes occurring in women with normal hearts because it plays so important a part in the determination of the question as to whether pregnancy itself adds a definite strain on the heart. The added weight of the breasts, the increased weight of the uterus, fetus and amniotic fluid, together with the mechanical disturbances accompanying elevation of the diaphragm, all use up a certain amount of cardiac reserve and when the reserve has already been depleted by valvular and myocardial damage, the decompensations seen in women with diseased hearts during pregnancy may more readily occur.

Frank has shown with frogs that the vigor of ventricular contraction is determined by the diastolic volume previous to the contraction. As every increase in the diastolic volume is accompanied by an increase of tension just previous to systole, this investigator concluded that the height of the initial tension, as the pressure at

the beginning of systole is termed, governs the vigor of contraction.

Blix and A. V. Hill shows that in skeletal muscle it is not the initial tension of muscle fibres, but the initial length of muscle fibres which determines the magnitude of energy production and after citing and discussing such work as this, Wiggers says, "It may with certainty be said, however, that the increased tension or greater stretching to which the muscle fibres are subjected during augmented filling is the mechanism through which the ventricle is able to eject larger systolic volumes and elevate systolic pressure to a higher level when the venous pressure increases."

While there has been much quoted to show that there is in many normal women a very definite increase in the amount of heart work, combined, at least in certain individuals with some hypertrophy and dilatation of the chambers, for the most part the serious disorders of circulation with decompensation occur during the late months of pregnancy and in parturition. This seems to make it probable that the greater disturbances occur when to the other sources of increased strain, certain mechanical disabilities are added. A possible cause of serious interference with heart work seems to lie in the position of the right ventricle. The right ventricle as compared with the left has relatively thin walls, its cavity on cross-section is roughly crescentic with its convex wall lying against the diaphragm. The tricuspid valve is much thinner, much more irregular in outline and more readily subject to relative insufficiency than are the other valves in the heart. Increased intra-abdominal pressure pushing up the liver and the diaphragm, causing them to push in turn against the right ventricle, conditions which develop during the later months of pregnancy, would surely interfere with that moderate dilatation which seems to be a definite part of the compensatory physiologic response to readily occurring under other circumstances.

When thought of in this way, the work of Frank and other physiologists throws much light upon the reasons for cardiac failure in the presence of heart disease during the later months of pregnancy, particularly since it has long been known that these conditions in which the right heart is most involved, prominent among which we find mitral stenosis, are the very ones in which the greatest likelihood of cardiac decompensation in pregnancy is found.

Classifications of the heart in pregnancy, on the basis of symptoms, of etiology, or of path-

ologic changes become so complex that confusion is inevitable and no one of these classes can be used alone. Classification on the basis of clinical significance has been proposed by Hamilton and Kellogg.<sup>6</sup> Following their suggestions three classes may be described:

Class I presents cardiac symptoms but is free from organic disease.

Class II, Doubtful cases without clear signs of previous heart damage.

Class III, Patients with definitely injured or disordered heart.

The recognition and management of these three classes will be outlined briefly, and in general terms.

*Class I, cardiac symptoms but no organic disease.* The women come to our attention because of breathlessness on exertion, more commonly on excitement; because of faintness or actual syncope; because of pain in the region of the heart; palpitation due to simple tachycardia, or to the fact that they are sensible of premature beats. The symptoms develop, as a rule, during the latter half of pregnancy. They are more common in primiparae, but may occur in a multipara and she may or may not have had the same symptoms in former pregnancies. If premature beats occur during pregnancy they are almost certain to occur in the intervals, although it may be with much lessened frequency. In the majority of cases given above the symptoms are accompaniments of conditions forming a neuro-circulatory group and variously named psychoneurosis, cardiac neurosis, effort syndrome and neuro-circulatory asthenia. In the pregnant woman the difficulty of recognition of the neurotic factors is increased by the simulation of cardiac hypertrophy and dilatation, by their occurrence on occasion in mild degree in the absence of cardiac damage, and by the frequent occurrence of a systolic murmur and accentuated pulmonic second tone. The non-organic murmurs of a pregnancy are not produced and not heard best at the apex. A systolic murmur may be heard near the pulmonic orifice, is usually much softer in quality and disappears or lessens greatly on change of posture, such as to sitting or standing. This is the "unimportant murmur." There is another systolic murmur, heard in some pregnant women, most common in the last two or three months, and usually accompanied by an accentuated pulmonic second tone. This is the murmur of a relative insufficiency at the tricuspid orifice, probably brought about by pressure distortion of this orifice, or of the wall of the right

ventricle as it lies on the diaphragm pushed up by the distended abdomen. This murmur is heard best not at the apex, but more toward the lower end of the sternum, or even a little to the right, and is soft and of a lower pitch. The increased pulmonary second tone may be thought of as due not to heightened intrapulmonary pressure, but to lessened pressure in the right ventricle, the effect of which should be, if the intrapulmonary pressure remains the same, to cause the pulmonary semilunar valves to close with a snap louder than normal.

The premature beats already referred to may occur only rarely and under certain circumstances, such as after a full meal, on quieting down after excitement, or on lying down to sleep. When they occur, organic disease must be excluded, but they are more common, in my experience, in pregnant women in the absence of demonstrable heart damage. In a few instances, they have been so frequent as to alarm both the patient and the physician, and to require drastic sedative measures covering up the excitement and fears they provoked. The women in Group I require no treatment, so far as the heart or circulation is concerned. It is the woman and not the heart that needs treatment. Each should exercise, work, play and rest as should a woman under the same circumstances with a normal heart, for hers is not damaged. To dismiss her as a "neurotic" is to confess our inadequacy as physicians. We should discover her unsolved problems, guide in their solution, or at least bring them to light, and explain their effects on her emotional life. We should explain away her fears. Above all, we should not treat such a woman as a "heart case." I have seen years of semi-incapacity result from such an unwise and wrong diagnosis.

*Class II, Doubtful cases without clear sign of heart damage.* Hamilton and Kellogg call them "possible cardiacs," believed to have rheumatic heart disease, congenital heart disease, or other cardiac disorder, but who do not show clear signs of injury. In all the cases in Class II, however, the important fact is that the signs of damage to the heart are not clear and unequivocal. If there is hypertrophy or dilatation, they are not more than seen in Class I, and a history of congestive failure in the past is lacking. If a lesion is present it is slight, the compensation is adequate for all ordinary conditions of life and has never been broken. Class II, like Class I, deserves painstaking prenatal care, but should be treated from the obstetric standpoint like the

normal. Instruction in the hygiene of effort and rest should be given, and the women should be told specifically how to avoid over-exertion and situations which may suddenly and of necessity call for it. During the period of expulsion these cases are deserving of careful study by a physician who understands the circulation, in addition to the physician who performs the actual delivery.

*Class III, Patients with definitely injured or disordered hearts.* With very few exceptions, there is clear evidence of hypertrophy and dilatation, or a diastolic murmur, or both. The rheumatic state is the most common causative factor in this class. The failure to get a clear history of rheumatic fever in about twenty per cent of cases with definitely rheumatic hearts is not peculiar to pregnancy, since acute joint disturbances may have been absent and the individual may nevertheless have had the typical carditis and accompanying valvulitis of rheumatic fever. Hamilton and Kellogg state that they include a few in this class because of very loud or harsh systolic murmur with thrill, usually with minor signs of injured heart, or because of serious disorder of the heart beat.

Certain situations in patients of this class are prone to result in disaster if the pregnancy goes through to term: (1) Congestive failure before the beginning of pregnancy, or in the first two or three months of gestation renders successful termination very unlikely. (2) Acute rheumatic fever during the first months of pregnancy, or within two years, and more definitely within one year previously, is almost certain to leave damage to the myocardium incompatible with success. (3) Auricular fibrillation is usually the accompaniment of severe lesions and in itself restricts the capacity of the heart to respond to strain; hence its presence should cause grave concern. Fortunately, it is not common in pregnancy. In my experience, if it is paroxysmal, it is seldom possible, in pregnancy, to modify the frequency and length of paroxysms. If it has become established, the severity of the direct and indirect effects may be lessened by digitalis therapy, but its connotations are still there. Auricular fibrillation is compatible with successful termination of pregnancy if the capacity of the myocardium is not unduly impaired. If there is fibrillation with congestive failure, the risk is very great. Prompt and effective control of the rates with digitalis is essential to successful treatment. Auricular fibrillation does not of itself justify abortion, or the induction of labor, but does demand skill-

ful treatment and prompt control. (4) Women who have arterial hypertension and become pregnant, fortunately a rare combination, are subject to serious danger. If it is the "essential" form; that is, hyperpiesia with none of the known toxic or renal causative factors, and is mild, early, and without clear evidence of cardiac hypertrophy or failure, careful management may lead to successful termination. If, however, the hypertension is secondary to a chronic glomerulonephritis, accompanied as it is by an anemia, the omens are distinctly unfavorable. The conditions, congestive failure, recent rheumatic fever, auricular fibrillation with marked lessening of cardiac reserve, and hypertension accompanying glomerulonephritis may constitute definite indications for termination during the first three or four months of pregnancy. Pregnancy should be interdicted under these same conditions and contraceptive methods are justifiable.

When, however, the above situations have been set apart, we will have in Class III a large group of patients with severely damaged hearts in whom the question as to procedure arises. Should the pregnancy be continued to viability? Should it be continued to term? Should it be interrupted at the earliest moment at which clinical judgment gives approval? There seems to be no formulation of a law which gives satisfactory guidance. It is my belief that the better one understands the crippled heart, the more one has treated both functional and organic disorders of the circulation, and the more keenly one feels his responsibility for the welfare of the mother as well as for the child, the less often is serious consideration given to interruption before full term. Looking back over an active interest and participation in these problems, I am surprised to find the number of times in which a watchful and expectant attitude has been maintained and to recall the ultimate satisfactory results.

It is not necessary to say that obstetric indications are to be followed with the same care that is used in women with normal hearts. When it has been decided that hands are to be kept off, so far as the pregnancy is concerned, the opposite policy must be outlined, understood and rigidly adhered to, so far as concerns the heart and circulation. All that application of our knowledge included under the term "prenatal care" is implied and in addition, a strict control, supervision and training directed toward conservation of heart power. This control must not be arduous nor should the attitude of the physician permit a gloomy interpretation on the part of the patient.

A woman with a damaged heart, of all people, needs a hopeful, confident, bracing mentor. The examinations of the circulation, to be made at least monthly, and after the sixth month more often, can be made the occasion for the instruction needed. The need for, and the ways of securing, proper rest, need emphasis and repetition. Certain periods of rest, based on general principles, need to be laid down and insisted upon. It is unnecessary to say that these cannot be the same in every instance, but three periods of rest can be established in nearly every case, the observance of which will shorten the hours of effort:

1. Early to bed with exceptions so few as to be considered as treats.

2. Breakfast in bed, with a rest of a half-hour, often much more, afterward. The prospective mother need not be ashamed to play the lady. As a matter of fact, if anyone deserves that opportunity today it is she.

3. Rest of an hour, at least, immediately after the midday luncheon. Many women will hold up their hands in horror at this injunction. I have but one answer, and that is to insist the more and to say that they must so arrange the household that they do not answer the telephone or doorbell, are not to be interrupted by the children, nor by the always curious and solicitous neighbors.

It is often necessary to outline how she can plan her day so as to minimize the number of times she climbs stairs and it is often to her advantage to lay down as a law the number of times not to be exceeded. The woman needs to be taught how she herself can tell when at a given moment she has exceeded the optimum amount of effort. To explain to her the significance of dyspnoea on exertion helps her to watch for and avoid it. Sometimes dyspnoea does not occur to act as a warning. In a few cases, particularly with aortic insufficiency, mild precordial pain substitutes as a warning signal. Pain must not be aroused and this injunction must be strictly observed. In some instances the warning signals are inadequate and the amount and character of exercise demands specific prescription. These latter cases require more frequent observation and study than do those where more general rules can be laid down, for their evidences of narrowing reserve are in the form of signs more than symptoms. Of the signals to be observed, the most important is the appearance, or increase in area, of persistent rales in the lung bases. No examination should omit careful search for them. Dyspnoea increasing out of proportion to that accompanying in normal fashion the ascent of the dia-

phragm, and the development of cough are warnings of similar significance. Likewise, the more frequent and ready development of precordial pain is important.

With the development of signs of narrowing reserve, including those just enumerated, the woman must be put to bed, preferably in the hospital, but certainly under hospital conditions. By the latter is meant conditions of service and care equal to those there provided. It is surprising how prompt the favorable response often is. Not only is this prompt response reassuring when it occurs, but it is of incalculable educational value to the patient and to her family, provided always, of course, that they are capable of being educated. When incapable, the need of this kind of care is the more acute.

The woman needs to be guarded against upper respiratory infections. Sharp colds in the family require early recognition and prompt isolation from her. As a rule, of course, even this is done too late to protect her. On the earliest development of signs on her part, she should go to bed, as outlined for narrowed cardiac reserve. Every effort should be made to protect against acute bronchitis, a development of serious import because of the effects of cough itself and because of accompanying and frequent damage to the myocardium by the infective processes.

When strict supervision is exercised, bed rest enjoined on indications, and a relatively successful campaign against infections maintained, few women in Class III, with the exceptions noted, fail to be carried to full term.

When, in the later months of pregnancy, signs of lessened compensation occur, it requires courage to persist in a waiting attitude. It is, however, only so far as the pregnancy is concerned that waiting is advocated here. As for the condition of the patient, her circulatory deficit and the symptoms accompanying it, prompt, positive and effective measures are demanded. Bed rest, in the form of "hospital conditions," has already been stressed. Continuance of these conditions through pregnancy, labor and a protracted puerperium is usually called for. With a response at all favorable, after a month to six weeks of complete rest, modification of the rest conditions is often possible, and certain liberties may be allowed. It is better to err on the side of too little liberty rather than too much. Examination with the attendant encouragement and instruction should be frequent enough to establish effective control and discover breaches in discipline. These women and their families are as likely to break control as are diabetic children to break diet. The physician

in his pride often thinks his dictum is enough. When he does so, he is likely to deceive only himself. Human frailty being what it is, the physician to succeed in his program is usually required to furnish not only the directions, but the stamina necessary to see them carried out.

All that has been said about management up to and through the puerperium applies to the period of lactation and care of the infant. The child is an added physical burden and the mother deserves and needs protection and management throughout the period of its nurture.

Medicinal measures to be adopted are the same as in decompensation under other circumstances and do not need to be detailed here. The only exception to be noted is in the case of quinidine, used in certain situations in an attempt to restore normal rhythm in aricular fibrillation. I have preferred not to use this drug in pregnancy, but to rely upon the safer and more certain effects of digitalis to slow the rate, rather than to attempt to abolish the irregularity. The only justification for a policy of interrupting pregnancy in the later months would be demonstration of its superiority when considering the life of the mother and child. Such demonstration has not to my knowledge been made.

Many women, however decompensated, have been allowed to go to term or have terminated the gestation spontaneously. The tissues of the birth canal in moderate decompensation appear to be somewhat softened and more readily distensible. As a result, the labor seems often surprisingly short and easy. Especially is this true when a certain prematurity is added.

Good practice, in my belief, requires in the later months of pregnancy that the physician and the obstetrician co-operate to carry a woman through to delivery. If in the period of expulsion, haste is required, the obstetrician is there to secure it, and the physician is there to afford such measures as may be needed to support the circulation. The results will be vastly better than when artificial termination is indulged in. Such co-operation should not be looked upon as entailing too much expense. If there is reason to expect difficult or prolonged labor, or if the range of compensation is so narrow as to suggest a break during labor even though shortened by the aid of forceps, Caesarean section is advised. Sterilization may be accomplished at the same time if indicated.

The woman with a damaged heart, when the risk is not prohibitive, deserves her chance to have more than one child. Intervals sufficient for complete restoration of compensation must be given and the mother watched and taught during

lactation and rearing of the child. A period of definite decompensation at any point along the way justifies later sterilization by proper means, demands contraceptive measures under proper indications and may even require the termination of active sexual relations.

No attempt has been made here to discuss the obstetrical or surgical indications or procedures. The subject has been viewed from the standpoint of the physician interested in the circulation and in the conservation of motherhood. The attitude here outlined has played a part in conserving

many worthwhile families and on many an occasion a surprising number of children to one mother.

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## Care of the New Born Infant\*

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THE physician who gives as much care to the small details of management of the new born as he should give to the management of the baby's mother will be responsible for both a lower immediate mortality and a future higher level of mental and physical health amongst the children whom he has brought into this world.

### HEAT LOSS

The new-born infant should not be chilled. To prevent heat loss a basket lined with warm blankets should be ready for the baby's reception and he should be kept covered until the cord is cut.

### CARE OF THE SKIN

The vernix caseosa may be removed by an oil bath on the first day; but in most instances oil baths after the first day are not necessary. A non-irritating soap and water bath followed by a liberal application of talcum powder, especially in the regions where two body surfaces rub together, is in the writer's experience more apt to result in a healthy skin.

In any event an excess of oil should not be left in the groin or axillae as it will so soften the outer layers of skin as to result in their being rubbed too thin. This is a common cause of so-called intertrigo and intertriginous eczema.

For many years the writer has had successful results in the prevention of pustular skin affections in newly born infants by using a routine which involved an oil bath on the first day, soap and water baths on subsequent days, and the use of no oil or ointment thereafter; but the thorough application after the soap and water baths of a

powder composed of calomel three parts, talc two parts and zinc oxide one part. Closing of the pores by powder is a phrase only, not an actual condition. The great argument for a powdered dry skin is that it is usually a healthy one. The reasons for this appear to be that desquamation is less than from an oiled or moist skin; consequently the skin itself is thicker, and second that conditions for bacterial growth are less favorable if the skin is kept dry.

### NOURISHMENT

In a state of nature the new-born baby would probably be given no water and no food other than breast milk. It is probable that the incidence of breast feeding would be greater if the baby were in the same room with the mother and if she were to feed it whenever it cried. This way of doing is not now practicable nor usually wise.

Most mothers are tired and weak after the strain of pregnancy and the trial of labor, and a four-hour nursing schedule beginning on the second day or even as late as the third day if the baby does not act hungry until then, will as a rule give the new-born sufficient milk and at the same time give the mother sufficient rest so that she will accumulate reserves to help her in caring for the baby later. During the first ten days it is as a rule better to allow the mother eight hours' sleep with freedom from nursing at night. Later, of course, during the period of rapid growth which extends into the second or third month, most babies will demand a night nursing. The usual figure for the baby's total liquid requirement is given as one-seventh of his body weight per day; but less than this can be given if the baby is

\*This paper prepared by invitation for this Special Obstetric Number of The Journal-Lancet.

watched to see that he does not become feverish or dehydrated.

There will always be an argument as to whether or not the average new-born baby should be given feeding in addition to the breast nursing. The following three statements are not in controversy: First, most babies who are given additional feedings will be plumper and probably cry less at the age of two weeks than those who are breast fed exclusively. Second, babies who are not given the bottle during the new born period are apt to be breast fed for a considerably longer time than those who are. Third, bottle feedings given regularly as an adjunct during the new-born period are liable to be followed by exclusive bottle feeding later.

At times the mother's milk is slow in coming, the baby is half starved, dehydrated and feverish. Then he should be fed. Many types of milk mixture are available. Every physician does best with the one he knows best. A good one is one-third or one-half boiled cow's milk with five to ten per cent milk sugar solution. It is usually best to have the baby take the breast first and then follow with the bottle rather than to give the bottle feedings only.

If the mother's breasts are inflamed or her nipples cracked and painful, it often helps to apply an ice bag to them and to give the baby the bottle only for from twelve to twenty-four hours. One will often observe that if there are deep cracks in the nipples and apparently much cause for maternal pain that the baby will be successfully nursed at the breast, whereas if the mother's complaints are loud and the pathology is of low visibility the offspring will almost certainly be raised by bottle.

A certain proportion of babies are lazy nursers. This laziness is made worse by bottle feeding. Such babies should be kept both hungry and thirsty. Thirst is as great or a greater stimulus to nursing than hunger itself. It is well to give such babies their water within a short time after the nursing rather than shortly before it. Some of these lazy nursers are physically weak and easily fatigued. Such babies will often do better when nursed on a three-hour interval, provided that the mother is in condition to endure such frequent nursing. As a matter of fact and experience, and despite theoretical opinions to the contrary, most new borns do better when they are given both breasts ten to fifteen minutes on each side at each nursing than when they are nursed for a longer time on one breast only.

At times when the baby is a very poor nurser it is advisable temporarily to use either hand expression of the breasts or a mechanical pump,

either the water pump or the electrical one, to obtain milk for the baby and at the same time stimulate the mother's breasts. The nipple shield made of glass and rubber is often used on the theory that the baby can get milk through it with less exertion on his own part and with less pain to the mother if she has fissured nipples. Occasionally it works; but more frequently it is useless. Metal shields and metal basket-like contrivances known as nipple aerators are sometimes of use in promoting the healing of cracked nipples and may be worn as dressings between nursings. The metal shields, usually made of lead, serve to prevent adhesion of gauze dressings to the raw surface of the breast, and the nipple aerators not only prevent contact with gauze dressings, but also allow ventilation and facilitate keeping the nipple dry. Some mothers object to them because they feel that they make their breasts appear too prominent.

#### CLOTHING

The physician is often consulted as to what clothing the mother should have for her new baby. In the ordinary overheated city home there is often a tendency to overdress the baby. A light weight knitted woolen sleeveless shirt to which the diaper is pinned is a serviceable garment. When wet it does not chill the baby as it would if made of cotton. Besides this woolen vest and the diaper, a cotton undershirt with sleeves to wear under cooler than average temperatures, and an outer garment which may be made of outing flannel, are sufficient. The latter should be long. The baby needs no stockings. The mother may buy the knitted sleeping garments sold in the stores if she wishes and of course she is at liberty to "doll" the baby up to her heart's desire if she does not overclothe him.

#### REST

New born babies need quiet, therefore outsiders who also are always possible disease carriers should be kept away.

#### SKIN DISEASES

The most common diseases of the new born are those of the skin. A method for prevention of pustular dermatitis has already been mentioned. If it occurs the baby should be isolated, the individual pustules should be emptied so far as possible without contaminating the surrounding skin, the calomel skin powder mentioned earlier should be liberally and frequently applied to the entire body, the ulcer bases left after evacuation of pus should be painted with twenty per cent silver nitrate and each morning before the calomel powder is applied to the baby he should be given a

general exposure to the rays of the mercury vapor lamp. The calomel powder does not adhere well to the fingers and it is well to anoint them with a two per cent ammoniated mercury ointment. The calomel powder has two disadvantages. When it is used for a long period the baby's underclothing becomes discolored, and if it is used along with alcohol or other antiseptics, as for example when the baby is circumcised, it is apt to produce a localized dermatitis.

#### HEMORRHAGIC DISEASE

Hemorrhagic disease, either external and manifest, or internal and occult, occurs with considerable frequency in new born infants. If the hemorrhage is external the diagnosis is obvious and whole adult blood, preferably from one of the parents, should be given subcutaneously as soon as possible. Usually thirty to fifty cubic centimeters given once or twice is sufficient. At other times the hemorrhage is internal, the most frequent site being intracranial although intrapleural and abdominal hemorrhages also occur. The baby may become stuporous and localized or general convulsions may occur and point towards the brain. Respiratory embarrassment with physical signs of intrapleural fluid may point toward the thorax, or abdominal distention and rigidity may hint at free blood in the peritoneal cavity or hemorrhage into various viscera, chiefly the adrenals.

Jaundice is present in nearly all new-borns. When the blood is examined for bile pigment it is found that this jaundice frequently persists for several weeks or months. In certain families the

jaundice is more severe and associated with hemorrhagic features. The prognosis in these cases is always grave. A proportion of these babies can be saved by transfusions and by subcutaneous injections of blood. If the administration of adult blood is not followed by good results it is well to select another donor whose blood may contain a larger amount of the anti-hemorrhagic principle. Repeated determinations of the infants' coagulation time, preferably by Rodda's method, are of the greatest value in measuring the results of treatment.

Hemorrhage into the sterno cleido mastoid muscle often occurs during the first few days of life, but as a rule is not recognized until it has produced a spindle shaped swelling during the second or third week. As a rule it requires no treatment.

Hemorrhages under the periosteum of the cranial bones produce the well-known cephalhematomata. These should not be opened as incising them may induce a large loss of blood or an infected haematoma.

The premature infant requires even greater attention to the small details of his care than does the full-term new born. Most medical men know in a general way at least how to care for the new-born infant whether premature or full term, but there is a tendency to leave the detail to some one else, maybe a nurse, maybe a wise old lady. Some of these women do very well, but some do not. The doctor if he assumes the care of the baby should himself see that the proper details of management are carried out.

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### WHAT PRICE MOTHERHOOD?

The penalties of motherhood are great.

According to the last report of the Bureau of the Census, 15,000 mothers in 1929 sacrificed their lives, seven maternal deaths for every 1,000 live births.

Most of these lives could have been saved by good obstetrics.

Thirty-seven per cent of these deaths were due to puerperal infection, an avoidable complication in a vast majority of cases by careful aseptic conduct of labor.

The toxemias of pregnancy took the next largest toll. Although toxic conditions cannot be prevented their dire results can be largely eliminated by their early detection through prenatal care and their prompt treatment. Unnecessary operations and avoidable hemorrhages account for altogether too many fatalities.

We have read much in medical literature about the high maternal mortality in the United States as compared to other civilized countries. Whether or not these statistics are entirely fair to this country because of the differing methods of calculation we must still admit that there are too many preventable maternal deaths.

That good obstetrics is the key to the situation is proved by the fact that when the deaths among the negroes of the South, among whom notoriously bad obstetrics is practiced, the maternal mortality compares more favorably with that of European countries.

It is generally recognized that wherever the

care of the pregnant woman is improved, there the maternal mortality decreased. By this token the medical profession of Minnesota may be pardoned for some degree of satisfaction.

In this state in 1920 the maternal mortality was 7.9 for every 1,000 live births. In 1929 it had become the lowest in the United States, 4.3, a reduction of more than 45 per cent.

The deaths from puerperal infection in Minnesota in 1920 were 2.9 per 1,000 live births; in 1929 the rate had fallen to 1.8, or over 37 per cent reduction.

Maternal deaths in the state from all other causes in 1920 were 5.0 and in 1929 2.5, a drop of 50 per cent. The average decrease of maternal deaths from all causes for the whole country was a little over 17 per cent.

Minnesota also does not suffer by comparison with the European countries.

The Bureau of the Census compares the American rates with Austria-Hungary, Canada, Denmark, Norway and Sweden, England, Scotland and Wales, Ireland, Germany, Italy, Poland and Russia. Of all these only Russia has a lower rate than Minnesota. Perhaps the papers published in this issue may give some inkling, representing as they do the specialists, the country practitioners and the teachers, of the reason for the lowered maternal mortality in Minnesota. They display a tone of sound judgment and conservatism attuned to the one theme of conserving maternal and infant life, a conservatism that has no fear of employing the so-called radical procedures when they are indicated, fearing only to do the wrong thing. Conservatism is not doing nothing, but doing the right thing.

If the physicians of Minnesota continue for another ten years the improvements in obstetric practice of the last decade the maternal mortality of the state will approach the minimum.

J. C. L.

## OBSTETRICAL TRAUMA

Gynecological practice is much concerned with the aftermath of obstetrical trauma. Injuries follow the natural trauma of childbirth and not infrequently in spite of timely aid skillfully rendered.

Modern obstetrical teaching has undoubtedly resulted in a tremendous reduction of genitourinary and rectovaginal fistulae. The immediate repair of perineal lacerations by the accepted methods of gynecological surgery saves many women from semi-invalidism. The immediate repair of all cervical lacerations, however, although apparently logical, has not yet proven the best practice. Severe hemorrhage from a lacerated cervix demands immediate action as a life saving procedure. However, in those cases in which there is no alarming hemorrhage we must consider the possibility of introducing infection during surgical invasion of the upper vagina and cervix. The possibility of infection becomes an increasing menace when such operative procedure is not done in a well appointed hospital with competent assistance. The cervical tissues immediately after delivery are not in an ideal state for surgical repair. Following suture if a temporary oedema occurs the sutures tend to cut, and the great decrease in the size of the cervix through involution soon leaves the sutures too loose to serve the purpose. Many severely lacerated cervixes heal spontaneously in a fairly satisfactory manner. Advocates of immediate cervical repair in all cases base their argument on saving the patient a second hospitalization and a second anaesthetic. However, the great majority of lacerated cervixes examined six or eight weeks after delivery will not require trachelorrhaphy or tracheloplasty. (I here refer only to the primipara or multipara who has a normal cervix before delivery). The neglected cervix, lacerated, everted and infected is not a proper subject for elective major operative procedure at the delivery table. The obstetrician should examine his pa-

tient six or eight weeks after delivery and advise necessary operative repair when indicated. At this time smaller lesions of the cervix can be treated with the cautery without hospitalization or general anaesthesia.

Cancers develop most frequently in chronically irritated cervixes. Lacerations of the cervix are frequently followed by low-grade chronic infections. Treatment with the cautery or tracheloplasty in suitable cases reduces the possibility of cancer developing at a later date.

H. M. N. W.

## THE ANNUAL BENEVOLENCE DRIVES

The humanism of our age is beautifully exemplified by many well organized societies that make it their business to look after unfortunates.

In order to suppress evil now-a-days, it seems that some "movement" must be started, and, in order that this movement shall be a success, funds must be raised, and this in turn calls for a "drive."

The "open season" is now on. Most drives are scheduled for the last two months of the year, ending with the sale of Christmas seals by which to fight tuberculosis, which of course we commend.

We realize that there is an especial need at this time, and those who can should be induced to show their generosity. Deficient diseases make greatest headway in times of economic stress.

In this connection, we would like to suggest a slogan used by enthusiastic road building promoters—"you pay for good roads whether you have them or not." Health measures for the community are like that. They cost money but sickness costs more.

The doctor knows and needs no urging. But, frankly, isn't it a good deal like passing the contribution plate to the poor and often unpaid preacher when the doctor is solicited?

A. E. H.



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 DR. R. E. WOODWORTH

Dr. R. E. Woodworth, for the past twenty-one years superintendent of the South Dakota State Tuberculosis Sanatorium at Sanator, S. D., died on Monday night, October 10, 1932. Dr. Woodworth was 66 years old.

Rollin Embury Woodworth was born on March 30, 1866, at Leon, N. Y., where his father, Charles E. Woodworth, was the pastor of the local Methodist church. One of his ancestors was Samuel Woodworth, author of the immortal poem, "The Old Oaken Bucket." When Rollin was 3 years old his father died and Mrs. Woodworth moved with her young son to Randolph, N. Y., where she taught and where Rollin attended the public schools and the Chamberlain Institute, a preparatory institution.

When Rollin was 16 years of age his mother was married to William P. Carr, who served as postmaster at Sioux Falls, S. D., under President Cleveland, the family having moved to Dakota Territory and settled in Sioux Falls several years before, Dr. Woodworth attended high school in Sioux Falls, graduating with the class of 1884, which was the second high school class of that institution. He then went to New York University medical school, graduating in 1889.

Dr. Woodworth then returned to South Dakota and started the practice of medicine at Valley Springs where he remained for two and one-half years. Then he was appointed physician for a large mining concern and for a time lived in Bisbee, Arizona. This work was not especially to Dr. Woodworth's liking and at the end of a year he moved back to Sioux Falls where he practiced for 18 years as a specialist in eye, ear, nose and throat. During a portion of this time he was physician at the state penitentiary.

Twenty-one years ago Dr. Woodworth was appointed superintendent of the State Tuberculosis Sanatorium at Custer in the Black Hills, a position he has occupied ever since and where he made a name for himself as administrator, builder and specialist.

The work of Dr. Woodworth in the building of the sanatorium at Sanator, South Dakota, in Custer county in the Black Hills, established him as one of the outstanding citizens of South Dakota and he has left in that institution a monument of which his friends are justly proud. He went to the superintendency of the institution under

pioneer discouragements which would have crushed a less patient or less optimistic man.

There was one small frame building with a few beds for patients. One nurse was in charge. There was a small office building on the premises. One man was employed as man-of-all-work. His mail and supplies were sent from Custer, five miles away, over roads that were frequently almost impassable; there was no light plant and illumination was by kerosene lamps; there was no central heating plant and the buildings were warmed with stoves heated with fire from pine wood. Called on emergency cases at night, Dr. Woodworth would find his way with the light of a lantern over rocks and fallen timbers to bring aid and comfort to the sick and dying. These hardships Dr. Woodworth met with smiling uncomplaint and he started to build.

Today the institution, under his management, has grown into one of the big institutions of the state. There are five large units with facilities for caring for 250 patients, a large and finely appointed administration building and dining room, a recreation hall, complete heating, water and sewage plants, a big herd of Holstein cattle to supply fresh milk for the patients, and a paved road from Custer to the sanatorium.

It is given to few men to rub the Aladdin's lamp of patience and industry and ceaseless devotion and to see spring up around them, in 20 years, such a succession of miracles as has been wrought at Sanator. The people of the state are proud of this institution and feel themselves under a deep debt to Dr. Woodworth, under whose guidance the institution has been built into one of the finest in the country.

Dr. Woodworth has been for years the idol of his patients and the trusted and respected leader of his organization. He has also made himself an outstanding figure in the affairs of Custer county and the southern Black Hills and in his passing, the whole western part of the state has sustained a real and irreparable loss.

During his long service at Sanator, Mrs. Woodworth has been a wonderful help to her husband and together they have worked unceasingly for 21 years with few vacations from the scene of their labors for the upbuilding of this institution and for its efficiency in the relief of human suffering.

J. F. D. C.

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## Social Insurance Impossible to Abolish When Once Established

EDWARD H. OCHSNER, M.D.

*Chicago, Ill.*

**T**HE worst feature of Social Insurance is the fact that when this parasite once gets its suckers well fastened into the vitals of a nation nothing short of either national bankruptcy, a dictatorship, or a revolution will be able to loosen its hold.

Germany which has had Social Insurance on its statute books the longest has for a considerable time been on the verge of bankruptcy. While other facts are operative, we believe that the billion dollars which Social Insurance costs the nation every year is one of the chief reasons why Germany is unable to make a satisfactory "come-back" to normalcy.

England is not much better off. The chief reason for England's present difficulties is the terrific burden of taxation which she has to carry. One writer says: "A complete understanding of the problems confronting England at the present time involves going back to 1909 when we had just adopted old age pensions and destroyed the foundations of thrift." In 1911 England introduced National Insurance when three percent of its workers were unemployed. After twenty years of operation of the act, seventeen percent of her workers are out of work. As a partial explanation for this condition let us cite just one example from among scores and hundreds that could be given. A manufacturer found that his orders were only sufficient to give work to all his employees four days a week so he called his workers together and told them the facts. The workers, however, insisted that they would work only three days a week in order that they could draw the dole for the other three days. An English writer commenting on this says: "It is a great mistake to worry about the much discussed abuses of the system. It is the system which is fundamentally wrong and abuse is inseparable from it."

To get an idea of the tax burden which England is carrying, we need but cite facts. In that country all incomes of seven hundred and fifty dollars per annum are taxed twenty-five percent. Higher incomes carry an additional surtax. Increased taxes have increased the production-cost of practically all articles of manufacture and, as a consequence, have actually increased unemployment because English Industry carrying this extra

burden has not been able to compete with other countries in the world markets. In spite of these burdensome taxes and in spite of the fact that living expenses had gone down eleven and one-half percent, the recent labor government refused to cut the sick benefits ten percent and put the nation to the expense and turmoil of a national election practically on this issue alone.

The countries just cited are not the only ones encountering similar difficulties. A recent newspaper article contained the statement that there are more than one hundred and fifty Federal boards and commissions in Washington each with three or more members drawing salaries and each with a bevy of clerks most of them just drawing salaries. Many of these were created during the World War. When a few far-sighted individuals remonstrated against the appointment of so many boards and commissions they were assured that they would all be abolished at the end of hostilities. It is now more than fourteen years since the signing of the Armistice but not one board has as yet been abolished.

Another illustration is the franking privilege to country newspapers. This privilege was extended to them when it was deemed desirable to disseminate news and information to rural inhabitants particularly to detached settlements. It was a wise and legitimate enactment at the time but now it is just a plain nuisance and yet no congressman would dare to suggest its abolition. It is costing the taxpayer and consumer a great deal of money and serves no useful purpose. A town of ten thousand and even fewer inhabitants usually has two and sometimes three local papers all enjoying this privilege. The local merchants are compelled to advertise in all of them, the expense of which must of necessity be passed on to the consumers. Incidentally this favors the mail order houses to the detriment of the local merchant.

There are many reasons why it is almost impossible to repeal the laws governing such practices. One reason is that executives and legislators do not want them repealed because it reduces the power which they derive through political patronage. The more patronage the individual in office has at his disposal, the more difficult it is to dislodge him. Even today it is very

difficult to defeat a public office holder with large political patronage, no matter how inefficient he may be, except by another who either already has large political patronage or who promises jobs to his supporters irrespective of their qualifications. Thus in many elections the voter is simply left to choose between two undesirable candidates. Already the number of payrollers has become so large and so politically active and influential that they yield great power in both political parties. If we then add compulsory health insurance we will add further thousands to the lists of our civil employees. Those who are not in government employ will be powerless to control government and their only function will be to pay the taxes which others impose upon them. Instead of increasing the number of government officials and employees, the ideal to be constantly kept in mind and striven for in this country is to permit the private citizen to perform all those functions that he can best perform and that make for independence, self-reliance, and strength of character and to have the government do only those things which the individual cannot do satisfactorily. We maintain that centralization in government and paternalism here already has gone much too far and that Social Insurance would simply be another step in the wrong direction.

Another reason why it will be difficult to repeal such laws is the fact that men in the different services of the government do not dare to expose its faults for fear of being accused of disloyalty. Reports must be couched in the most mild and ineffective language possible and then they must not be released to the public but allowed to die as still-births in the departments. We all know what happened to General Mitchell who dared to disregard these rules. Major-General Robert Alexander also tells in the introduction to his *Memoirs of the World War* just how this worked in at least one other instance.

In most countries which have Social Insurance such laws were first suggested and urged by well-farers, uplifters, and visionaries who unwittingly played into the hands of practical politicians. Even now few seem to realize that bureaucracy in a republic may become just as unreasonable, oppressive, and ruthless as a despotism.

It will be interesting to see whether we shall be able to profit by the experience of others or whether as a nation we belong to that class of human beings who can learn only by dire personal experience or from national disaster.

(The next article will offer a number of counter-suggestions in place of Social Insurance.)



## NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Dr. Wm. Duncan, a member of the Watertown S. D. Clinic has accepted a position on the Webster Clinic.

Dr. J. R. Ostfield, who has been located at Jamestown, for several years, has moved to Fargo and resumes general practice.

Dr. Iver S. Benson, formerly in practice at Montevideo, Minn., has moved to Wilmar, and opened offices for general practice.

Dr. H. L. Saylor, Huron, S. D. was accepted as a fellow of the American College of Surgeons at the meeting held at St. Louis last month.

Dr. M. L. Samma, formerly in charge of the veterans hospital at Fargo, has been transferred to the U. S. Veteran Hospital at New Orleans.

Dr. O. J. Smith, who has been located for several years at Orient, S. D., has moved to Denver, Colo., and will open offices for general practice.

Dr. F. J. VonBohland, who has been in active practice at Belle Plaine, Minn., for the past forty years, died at his home residence at the age of 65 years.

The meeting will combine official deliberation with an important scientific program. Besides the council, other officers of the state society will be present.

Announcement has been made that the American College of Physicians will hold its Seventeenth Annual Clinical Session at Montreal, February 6-10, 1933.

Dr. B. C. Murdy, Aberdeen, S. D. was in attendance at the annual meeting of the Clinical Congress of the American College of Surgeons recently held at St. Louis, Mo.

An error in the issue of October 15th stated that Dr. W. C. Dieterich had returned to Huron, S. D., for practice. Dr. Dieterich has never been, or is at present, located in that city.

Dr. W. A. Coventry, Duluth, was one of the speakers at a medical meeting held under the joint auspices of the Stearns-Benton county and the Upper Mississippi Medical societies at Little Falls last month.

Verndale, Minn., has had two new physicians locate there recently. Dr. H. G. Bosland, a University of Minnesota graduate, and Dr. G. J. Hanley, graduate of the Bellevue Medical College, New York City.

Dr. A. T. Laird, superintendent of Nopeming, Minn., sanatorium, was elected president of the Minnesota Trudeau Medical society at the annual meeting held in Minneapolis. He succeeds Dr. F. E. Harrington, Minneapolis.

The council of the Minnesota State Medical association held its first meeting outside of its St. Paul headquarters, as guests of the Stearns-Benton and Upper Mississippi Medical societies at Little Falls, October 22.

Dufort has two previous convictions for practicing in violation of the Basic Science Law, both of which resulted in one year county jail sentences which were also suspended on the promises of the defendant to refrain from practicing.

Announcement has been made that Dr. Floyd Coslett, who has been assistant superintendent at the South Dakota tuberculosis hospital at Sanator, S. D., for the past five years, will succeed the late Dr. R. E. Woodworth as superintendent of the institution.

After serving the people of Warren, Minn., and surrounding community as a practicing physician since 1884, Dr. G. S. Wattam, Warren's pioneer physician, retired from active practice, when he announced the sale of his office equipment and practice to Dr. O. J. Engstrand.

Dr. C. A. Scherer, Duluth, was elected president of the St. Louis County Medical association at the annual meeting last month and Dr. W. J. Ryan, Duluth, was elected first vice president; Dr. R. L. Burns, Two Harbors, second vice president; Dr. M. McC. Fischer, Duluth, secretary-treasurer.

The State Board of Medical Examiners conducted the investigation of the three cases against Dufort and they intend to fulfill their duty under the law in the future. Complaints will be filed against those who practice without the necessary credentials whether it be Dufort or some other person.

Dr. Ragnar T. Westman, Minneapolis graduate of the University of Minnesota Medical School, Chief of the Quarantine Division of the Minneapolis Department of Health, Minneapolis, was recently married to Miss Gladys Enilie Magiera R. N., a graduate of the St. Andrew's and the University of Minnesota Schools of Nursing.

Dr. S. A. Slater, superintendent of Minnesota sanatorium, addressed the Plymouth County Medical society at LeMars, Iowa. His subject was: "The Diagnosis of Pulmonary Tuberculosis." The meeting was held in the fine Sacred Heart hospital, and Dr. Slater returned very much impressed with the ideal hospital situation created by that institution.

J. E. Dufort, 57 years of age, residing at Mizpah, Minn., entered a plea of guilty to an information charging him with practicing healing without a Basic Science Certificate on Oct. 4, 1932 before the District Court at International Falls. The Judge sentenced Dufort to one year in the county jail and suspended the sentence until the May, 1933 term of Court in that county.

Dr. J. A. Myers, Minneapolis, president of the Minnesota Public Health Association, will be one of the speakers at a one-day short course for physicians of Wadena county to be conducted at Fair Oaks Sanatorium, Wadena, Minn., November 10. Practical laboratory work and examination of patients will be included on the day's program. The course will be financed by Christmas Seals.

The regular meeting of the Huron District Medical Society was held, October 13. After dinner was served papers were presented by W. L. Matlock, M. D., Huron, and H. D. Sewell, M. D. Huron. Dr. J. R. Westaby, of Madison, President of the South Dakota State Medical Association, made an official visit and presented, "Morphology of the Cancer Cell" (Motion picture).

In view of the importance of the case and the fact that it is the first time in the five years the Basic Science Law has been in effect, that three suspended sentences have been given the same script of the proceedings at the time Dufort was sentenced. Following Dufort's second conviction a licensed physician located at Northome to serve the people in that vicinity. This doctor still resides there.

Dr. Herbert Boysen, of Welcome, Minn. was elected president of the Blue Earth Valley Medical Association at its annual meeting in Blue Earth. Dr. A. W. Sommer, of Elmore, was named vice president. Dr. R. C. Hunt, Fairmont, secretary. Dr. J. L. Mills, of Winnebago, was named trustee. The doctors listened to an address on the "Heart" given by Dr. F. A. Willius of Rochester.

The Aberdeen District Medical Society presented the following program: "The Progressive

Adaptations of the Circulatory system," by A. G. Pohlman, M. D., Dean, University of South Dakota Medical School, Vermillion. "Morphology of the Cancer Cell," (motion picture), by J. R. Westaby, M. D., President of the S. D. State Medical Association (official visit). "The Viennese Physician," by J. D. Alway, M. D., Aberdeen.

Dr. Francis M. Pottenger of Monrovia, Calif., as President of the College, has charge of the program of General Sessions. Dr. Jonathan C. Meakins, Professor of Medicine and Director of the Department, McGill University Faculty of Medicine, is General Chairman of local arrangements and in charge of the program of Clinics. Mr. E. R. Loveland, Executive Secretary, 133-135 S. 36th Street, Philadelphia, Pa., is in charge of general business arrangements, and may be addressed concerning any feature of the forthcoming Session, including copies of the program.

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday Morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters). Speaker, William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The programs for the month of November will be as follows: November 2nd—Aids in the Diagnosis of Heart Disease, November 9th—Psittacosis, November 16th—The Child's Education in Health Matters, November 23rd—Disease carriers, November 30th—Tumors of the Salivary Glands.

The Sioux Falls District Medical Society met on Tuesday, October 11, for a 6:30 dinner program as follows: "Osteomyelitis of the Tip of the Petrous Portion of the Temporal Bone. Report of a case with post mortem findings," by R. K. Miller, M. D., Madison. "A new method of post operative treatment in suprapubic prostatectomy," by R. S. Westaby, M. D., Madison. "Congenital Atresia of the jejunum with Report of a case," by D. S. Baughman, M. D., Madison. "Morphology of the Cancer Cell" (motion picture), by J. R. Westaby, M. D., Madison, President S. D. State Medical Association (official visit). J. F. D. Cook, M. D., Secretary of the South Dakota State Medical Association, presented the statue of the Basic Science Bill, urging members to co-operate in returning the Questionnaire with constructive criticism. This was a joint meeting of the Sioux Falls District Society with the Madison District as guests, who presented the scientific program.

# THE JOURNAL-~~L~~ LANCET

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## The Diseases of the Blood\*

(A Grouping with Reference to the Changes Occurring in the Blood  
Formative Tissues)

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**I**N presenting the subject of the diseases of the blood I shall endeavor to group the different blood dyscrasias according to the part that the bone marrow plays in producing the recognizable changes from the normal in the peripheral blood. The more unusual blood conditions such as von Jaksch anemia, sickle cell anemia, the splenic anemias and sprue, the latter a rare condition in this geographical section, will not be discussed.

In Group I will be discussed the aplastic or aregeneatory diseases of the bone marrow. In this group the essential feature is the failure of the formative tissue or regenerative function.

### GROUP I

#### *The Aplastic (or Aregeneatory) Diseases of the Bone Marrow*

- A. Aplastic Anemia (Erythropenia).
  1. Primary or idiopathic.
  2. Secondary, due to (1) chemical poisons (2) radioactive substances (3) severe infections (4) system diseases.
- B. Aganulosis, Granulopenia or Neutropenia.
- C. Thrombocytopenic purpura (Thrombocytopenia).
- A. In aplastic anemia the formative tissue pro-

ducing the red blood cells, white blood cells of the myelocytic series (granulocytes) and platelets does not function.

Aplastic anemia from the etiological standpoint may be divided into two types (1) the primary or idiopathic, which affects young adults chiefly, but which may be found extending into both extremes of the life span. The cause of this condition is unknown, but a congenital defect in the hemopoietic tissue may be assumed. (2) The secondary type is due to known causes of which the important are:

(a) The chemical poisons—benzol, particularly among workers in the tire industry, dry cleaners, printers, tanners, painters and gilders; trinitrotoluol poisoning among munition workers, and arsenic, especially in individuals receiving intensive arsphenamine therapy. The fact that arsenic can produce aplasia of the bone marrow is a point of great importance and every patient receiving intensive arsphenamine treatment should have a complete blood count before a new series of arsphenamine injections is instituted. For the same reason the use of arsenic in the treatment of anemia is no longer tenable.

(b) Likewise workers with Roentgen ray, radium and other radioactive substances should have frequent blood examinations.

\*Read in part at the meeting of the North Dakota State Medical Association, June 1-3, 1932, at Grand Forks, N. D.

(c) Severe infections may also produce marked bone marrow injury and aplastic anemia.

(d) Severe systemic diseases, especially pernicious anemia and the leukemias and erythremia (polycythemia vera) may have a terminal aplastic phase.

In secondary aplastic anemia, due to chemical poisons and radiation, it is of great importance that the condition be recognized when it is in an early stage so that the patient can be removed from destructive influence of these agents on the hemopoietic tissues before a complete destructive effect on these tissues is produced.

**CLINICAL FEATURES:** The clinical picture of aplastic anemia is a severe anemia with hemorrhagic features, alveolar necrosis with bleeding, with attendant sepsis and marked exhaustion. The blood index is usually normal, .9-1, but exceptionally a remarkably low or high index may be recorded. There is a progressive reduction of the red blood count. The red blood cells are often strikingly normal in appearance considering the severity of the anemia. Evidence of regeneration; namely, reticulocytosis, polychromatophilia and the presence of nucleated red blood cells is absent. The white blood count is low (usually 2000-4000), the granulocytes are much reduced (20-40 per cent), the percentage of lymphocytes is high and the platelets are much diminished. A low white blood count in a severe anemia should suggest the possibility of aplastic anemia, especially if anisocytosis and poikilocytosis are not outstanding. The anemia is non-hemolytic in contrast to pernicious anemia. Free hydrochloric acid would be expected to be present in the stomach contents. The critical examinations of the data at hand in patients under 30 years of age previously diagnosed as pernicious anemia often changes the diagnosis to aplastic anemia. This is especially true if the anemia does not promptly respond to adequate dosage of liver extract or ventriculin.

**PROGNOSIS:** The primary type is uniformly fatal. The usual duration of life is two to four months after onset of the first clinical symptoms. An occasional case of the secondary type recovers.

**TREATMENT:** The primary type does not appear to be benefitted even temporarily by transfusions and the patient usually does not bear transfusion well. In cases personally seen the conclusion arrived at is that reactions after transfusion are both rather frequent and severe. Repeated transfusions in the secondary type, for the purpose of lessening hemorrhage and stimulating any remaining active bone marrow is indicated.

*B. Agranulosis and Granulopenia*—The condi-

tion now known as agranulosis was originally described by Schulz<sup>1</sup> as a disease of middle aged women, producing gangrenous stomatitis, angina, high fever, agranulosis and early death. Until the last two to three years it was designated by the term agranulocytic angina. Since then the diagnostic requisites have become less rigid and cases in the male sex and cases without angina have been included. Cases with milder manifestations and less rapid progression are also being reported. Jackson<sup>2</sup> considers that agranulosis is of two types (1) the agranulocytic angina, as originally described by Schulz, and (2) the type which accompanies overwhelming infection. Roberts and Kracke<sup>3</sup> describe the clinical picture and the sequence of events in a case observed by them as follows:

1. Four days of sluggish and tired feeling (coincidental with stage of bone marrow onset).
2. Fifth day chills and fever (disappearance of granulocytes from the blood stream).
3. Seventh day, redness of the throat and rest-less stupor.
4. Eighth day, coma and death.

In this condition the granulocyte formative portion of the bone marrow is affected exclusively and the neutrophiles, eosinophiles and basophiles disappear from the circulation. The lymphocytes are often reduced in absolute number. In 79 cases collected and in three cases personally seen by Ordway and Gorham<sup>4</sup> the average white blood count was 1200 with 4 per cent granulocytes. The onset is that of a severe acute infection, ulceration and necrosis of the buccal and pharyngeal tissues and adenopathy. The latter is not a constant feature and occurs in about half of the cases. Jaundice, presumably a toxic jaundice, occurs in 50 per cent of the cases. The hemorrhagic tendencies are not at all prominent. The mortality experience to date is about from 50-90 per cent, according to various authors. Roberts and Kracke<sup>5</sup> also call attention to the condition of a relative agranulosis or granulopenia. In 1881 cases out of 8,000 blood counts, with a total granulocyte count below 4,000, weakness, exhaustion and easy fatigue were twice as common as in patients with a normal granulocyte count (above 4,000).

**DIAGNOSIS:** 1. From acute leukemia in the aleukemic stage, by the presence of anemia, hemorrhagic tendencies and by the higher white blood count in leukemia. Excessively low white blood counts are not common in acute leukemia.

2. Acute infectious mononucleosis or acute benign lymphadenosis is less severe in its mani-

festations and a higher white blood count is almost invariably present.

3. The onset of aplastic anemia is more gradual, pallor and anemia are striking and hemorrhagic tendencies are present.

4. To confuse the condition with diphtheria is the real danger, and this is the diagnosis most often made.

TREATMENT: Eliminating and draining an existing focus of infection has accounted for a recovery in the majority of cases having a favorable outcome. Frequent transfusion may be helpful. Friedman<sup>6</sup> reports four cases that recovered following Roentgen ray exposure of the long bones. For treatment with Nucleotoid K96, see the discussion by Hetherington.

C. *Thrombocytopenic Purpura*—Ordway and Gorham<sup>7</sup> divide the purpuras into three groups:

1. Primary (always thrombocytopenic).

2. Secondary or symptomatic (usually thrombocytopenic) occurring in the severe anemias, leukemias, severe infections, toxic conditions and poisons.

3. Non-thrombocytopenic purpura occurring in (1) Anaphylactoid purpura (Schoenlein-Henoch syndrome), (2) Purpura simplex (3) Purpura from avitaminosis (scurvy), (4) Cachectic purpura, (5) Purpura of renal insufficiency.

We will concern ourselves only with the primary or non-thrombocytopenic purpura. The condition is probably not due to the failure of the production of the blood platelets by the megakaryocytes in the bone marrow entirely. Increased destruction of blood platelets must be taken into account, in view of the improvement following splenectomy.

CLINICAL FEATURES: 1. A history of former hemorrhagic tendencies can usually be elicited.

2. The presence of an infection prior to the attack occurs too often to be coincidental.

3. Uterine hemorrhage, hematuria and gastrointestinal bleeding may mark the onset and may command so much attention that the underlying condition may be overlooked. It is not uncommon to have the patient consult or be referred to a urologist when hematuria marks the onset.

4. Marked secondary anemia and fever may develop.

The criteria requisite for diagnosis are:

1. Marked reduction of blood platelets. The platelet count may be as low as 10,000.

2. Prolonged bleeding time from a normal of 3 minutes to 15 minutes to several hours.

3. Relatively normal clotting time but failure of the clot to retract.

4. A positive capillary resistance test manifested by numerous petechial hemorrhages in the

skin after the application of the blood pressure cuff to an extremity with air pressure maintained at a slightly higher level than the diastolic blood pressure for a period of 10-15 minutes. The skin presents an appearance remarkably like that of a turkey egg in a positive test.

5. The low platelet count, the non-retractile clot and the positive capillary resistance test are more significant and more constant than the prolonged bleeding time and normal coagulation time in diagnosis.

DIFFERENTIAL DIAGNOSIS: 1. From leukemia in the subleukemic stage by a carefully done differential count and the presence of immature cells and from aleukemic lymphatic leukemia by a relatively high lymphocyte count in the latter.

2. From agranulosis by the lack of hemorrhagic features, low white blood and granulocyte count and buccal and pharyngeal necrosis in agranulosis. The platelet count would also be expected to be normal.

3. From aplastic anemia by the low white blood count, decreased granulocytes and reduction of red blood cells in aplastic anemia. Cases of aplastic anemia, however, may present the essential diagnostic features of thrombocytopenic purpura; namely, (1) low platelet count, (2) non-retractile clot, (3) positive capillary resistance test.

If aplastic anemia is complicated by infection so as to increase the white blood count, or if thrombocytopenic purpura has developed a marked anemia from hemorrhage the differentiation of the two conditions may be almost impossible. Duke<sup>8</sup> states that transition forms of the two diseases exist.

TREATMENT: 1. Intramuscular injection daily of 20 cc. of uncitrated, unmatched blood has been used with considerable success by Ordway and Gorham<sup>9</sup>.

2. Repeated large transfusions every 2-5 days, preferably by the direct method. A platelet increase of 10,000 often brings about marked diminution in the tendency to bleed, and with a rise of 30,000-40,000 bleeding stops altogether, according to Duke<sup>10</sup>. Larabee<sup>11</sup> found that a large transfusion increased the platelet count by about 20,000. A transfusion also may occasionally increase bleeding. Transfusion is important in connection with operative procedures, both before and after, especially in patients with a red blood count under two million.

3. Ultraviolet light and irradiation of the spleen with Roentgen ray have been used. The former is probably of less value than the latter, and irradiation of the spleen appears to be a more logical procedure.

4. *Splenectomy*—Selection of cases<sup>12</sup> should be on the basis of (1) accurate diagnosis as to primary type, (2) cases must not be the acute fulminating type, (3) chronic type with acute exacerbations and with large spleen the favorable type for surgery. If protected both before and after operation with transfusion the mortality should be about 10 per cent. In acute fulminating type the surgical mortality is about 90 per cent. The first effect of splenectomy on the platelet count is a sharp rise but it does not return to normal. Later it drops but the tendency to bleed disappears. The result is good in 90 per cent of splenectomized patients, in others the bleeding recurs. Morrison<sup>13</sup> et al. suggest relapse is due to the failure to remove accessory spleens.

Since the three diseases above considered all present oral lesions, and since their clinical aspects may be strikingly similar, this group constitutes an important one from the standpoint of diagnosis, prognosis and correct treatment.

#### GROUP II

##### *The Hyperplastic Diseases of the Bone Marrow*

- A. Erythremia or Polycythemia Vera.
- B. The Leukemias.
  - 1. Lymphatic (acute and chronic).
  - 2. Myelogenous (acute and chronic).
- C. (Infectious Mononucleosis or Acute Benign Lymphadenosis.)

In this group there is a pathologic activity of the formative tissues of the bone marrow. Minot and Buckman<sup>14</sup> have suggested that erythremia and myelogenous leukemia are of the nature of neoplastic diseases of the bone marrow. Late cases of erythremia often develop hemorrhagic tendencies. Others die with an anemia, and with a leukemic blood picture, which again emphasizes the similarity in the two conditions. In lymphatic leukemia the lymphoid tissue in the bone marrow is affected along with the lymphatic tissues in other parts of the body so it may be considered as belonging to this group. Infectious mononucleosis or acute benign lymphadenosis is tentatively placed in this group because of the rather close cytological resemblance to acute leukemia.

A. *Erythremia or Polycythemia Vera*—The hemoglobin, red blood cells, specific gravity, viscosity and blood volume are all increased. The red color may not always be apparent and the symptoms may be strikingly like pernicious anemia, as Christian<sup>15</sup> has pointed out. Muscular weakness, especially leg weakness on walking, is a striking symptom. The head symptoms suggest cerebral arteriosclerosis; namely, headache, vertigo, tinnitus, thickness of speech, loss of memory

and transient unconsciousness. Levine<sup>16</sup> has aptly stated that both erythremia and brain tumor can often be picked out of the "waste basket" of cerebral arteriosclerosis. The spleen is usually enlarged. The red blood cells number from 6-15M, the index is low and the hemoglobin may be below 100, although 110-115 is the usual figure. There is a tendency to red blood cell immaturity, reticulocytosis and increased blood viscosity, which may be 5 to 8 times normal. The disease pursues a slow course, 4-20 years, and is ultimately fatal. It may be latent for years. Increased blood volume and viscosity may suggest the diagnosis in the latent or very early stage.

DIAGNOSIS: (1) From erythrocytosis due to high altitude. (2) From chronic pulmonary disease, especially Ayerza's disease. (3) Erythrocytosis in slowed circulation of heart disease, and hypertension. (4) Erythrocytosis due to toxic or chemical action of the blood, of which O<sub>2</sub> carrying capacity of the blood, of which the best example is CO poisoning.

TREATMENT: (1) Splenectomy, though occasionally successful, is contra-indicated because it is too often a failure. (2) Roentgen ray gives considerable promise when small doses are repeated over the long bones over a long period. Hofheinz<sup>17</sup> reports 12 out of 14 cases in which the red blood count was definitely lowered. It should be used in patients having difficulty with the administration of phenylhydrazine. (3) Phenylhydrazine acts by producing hemolysis of red blood cells. It produces a marked bilirubinemia. 1.5-3.0 G. given over a week or ten days is the usual dosage. 3 G. is considered the usual maximum total dose, although an occasional refractory case is seen in which as much as 4.5 G. must be given. The usual procedure is to begin with .1 G. three times a day. The dose should be reduced to .2 G. a day as soon as the first evidence of hemolysis is apparent in the serum, and still further reduced, depending on the intensity of hemolysis, so as to avoid too great destruction of red blood cells. The effect of the drug is cumulative. Daily hemoglobin, red and white blood cell and serum bilirubin determinations are necessary in gauging the effect of the drug. A maintenance dose of .1-.3 G. weekly should be continued to keep the blood count at a level in which the patient is free from disagreeable symptoms and the patient's physical strength at a maximum. (4) Benzol is not favored because of the danger of producing aplasia of the bone marrow.

#### B. *The Leukemias:*

1. *Chronic Myelogenous Leukemia*—The hyperplasia of the bone marrow is the final requisite on

which the diagnosis rests and not the appearance of the blood. The blood picture may be sub-leukemic or even normal, and yet the diagnosis be positive in the marrow. Immaturity of the cells is more important than the number.

**CLINICAL FEATURES:** The usual age of onset is from the twentieth year to the fortieth year. The duration is 3 to 4 years. The first symptom is often a dragging sensation or discomfort in the left side of the abdomen. This is followed by loss of weight, anemia and vertigo. The tolerance for cold is rather remarkable. Priapism mentioned in the older text books occurs in a small minority. The history of the onset in some cases may suggest tuberculosis. The eye grounds are rather characteristic, the fundi are pale and there are multiple white flecks with hemorrhagic borders in the retinae, especially in the periphery.

**DIFFERENTIAL DIAGNOSIS:** (1) From leukemoid reactions in infection, especially in children in which a myelocyte count of 5-10 per cent may be present. The age and the absence of eosinophiles and basophiles should be helpful in differentiation. In an intense myeloid reaction with anemia in the adult the same blood criteria should eliminate leukemia. In one of my cases with a chronic portal phlebitis, with a rather large hard spleen, anemia, a white blood count of 30,000, with over 95 per cent granulocytes and 2-3 per cent myelocytes the postmortem examination was required to finally definitely eliminate leukemia. (2) With Hodgkin's disease with enlarged spleen and high granulocyte count, and myelogenous leukemia with enlarged cervical lymph glands the absence of myelocytes, eosinophiles and basophiles is against leukemia.

2. *Chronic Lymphatic Leukemia*—This occurs most frequently between the ages of 40 and 60, but is found in both extremes of life. Proliferation of the lymphatic tissue throughout the body, including the bone marrow, occurs. The spleen is enlarged but not so outstanding as in myelogenous leukemia. The average duration of life is five years after the diagnosis is established, though the aleukemic types with enlarged liver and spleen may live 15 years or more. The favorable cases are those in which there is no anemia, in which the lymphocytes retain their normal appearance and azurophilic granulation and in which immature cells are absent. Reduction of platelets, a rather constant occurrence in myelogenous leukemia, constitutes an unfavorable prognostic sign in lymphatic leukemia.

**DIAGNOSIS:** One much enlarged tonsil or a dermatological reaction accompanied by much infiltration of the skin should always raise the ques-

tion of lymphatic leukemia. General adenopathy with a white blood count of 50,000, with 90 per cent lymphocytes is usually sufficient evidence for leukemia. The aleukemic forms are often difficult to diagnose. Cases with a typical blood picture and with clinical features lacking occur. More difficulty occurs in the proper interpretation of lymphocytosis than in any other hematological finding. Mistaken diagnosis must be particularly guarded against in confusing the condition with acute benign lymphadenosis or infectious mononucleosis with a high white blood cell count.

3. *The Acute Leukemias*—Acute leukemia is usually found under 25 years of age. There is a rapid onset, prostration, tendency to bleed, ulceration and gangrene of oral tissues and enlargement of the cervical lymph glands. It may occur following acute tonsillitis or dental extraction. There is early severe anemia. The acute myelogenous form occurs more often than was formerly supposed.

The clinical features of the acute myelogenous and lymphatic leukemias are much the same and the differentiation is a hematological one. In the myelogenous type the blood shows a marked anemia, immaturity of the red cells, and if the case is in the subleukemic or aleukemic stage the blood smear may resemble pernicious anemia. The platelets are also diminished. The first impression is usually that the white cells are large lymphocytes but closer observation discloses some neutrophilic granulation. The predominant cells are myeloblasts and premyelocytes. Eosinophiles and basophiles are absent. The oxidase reaction is helpful in differentiation only if positive. Naegeli<sup>18</sup> stresses the morphology of the myeloblast as compared to the lymphoblast. The myeloblast has a darker cytoplasm, more nucleoli (4-5) and a lighter staining nucleus. In many cases differentiation is well nigh impossible.

**DIAGNOSIS:** Early acute leukemia is often diagnosed scurvy, ulcerative stomatitis, quinsy, septic sore throat and diphtheria. The possibility of mistaking an acute exacerbation of the chronic form for the acute variety should be kept in mind. A severe infection with severe anemia with intense myeloid reaction is the one pitfall in the diagnosis of acute myelogenous leukemia. Acute infectious mononucleosis and agranulosis may confuse the diagnosis in acute lymphatic leukemia but the presence of hemorrhagic tendencies and severe anemia should suggest leukemia.

**TREATMENT OF THE LEUKEMIAS.** The Roentgen ray has a marked palliative effect in leukemia but it has been superseded by radium. Likewise radium treatment is not as effective in chronic

lymphatic leukemia as in chronic myelogenous leukemia. However, because of the greater availability of the Roentgen ray and because of the experience required and the more highly developed technique for successful radium therapy the majority of cases distant from the large medical centers will be treated with Roentgen ray.

The conclusions as to radium and Roentgen ray therapy based on present experiences, according to Ordway & Gorham<sup>19</sup> and McAlpin and Sanger<sup>20</sup> are:

(1) Radiation treatment does not cure leukemia but the palliative effect is great. The blood picture, spleen and lymph glands become almost normal. The patient is changed from an emaciated individual into one well nourished and strong.

(2) Remission is established of varying duration, may be years.

(3) Patients should be watched indefinitely though they appear to be normal. A slight rise in blood count or basal metabolic rate may indicate a relapse and the patient be unaware of its imminence.

(4) Frequent blood counts an absolutely necessary check as the patient may be over-treated.

(5) An elevated basal metabolic rate in spite of adequate responses in blood picture and reduction of spleen and lymph glands is a bad prognostic sign.

SPECIAL INDICATIONS AND CONTRA-INDICATIONS FOR TREATMENT: Indications—(1) Elevated basal rate even though blood count is low.

(2) White blood count above 100,000 even though basal rate is not elevated.

(3) Resumption of treatment indicated on rise in either white blood count or basal rate.

(4) If leukemic infiltrations produce disturbance of vital functions because of their size.

(5) Leucopenia not a contra-indication but should be treated cautiously if other indications for treatment are present.

Contra-indications:

(1) Treatment should not be given because patient has leukemia.

(2) If marked bone marrow involvement is present and marked anemia and thrombocytopenia are produced.

(3) When the circulatory blood contains a large number of immature cells.

(4) Treatment is contra-indicated in the acute leukemias.

While radiation treatment does not greatly prolong life the patient has a better morale and is much more comfortable while he is living. In a series of 71 cases reported by Hoffman and

Craver,<sup>21</sup> who received irradiation, the average duration of efficient life averaged 2.13 years. Radiation treatment added about ten months of efficient life compared with non-irradiated cases. Forkner and Scott<sup>22</sup> have recently attempted to revive interest in the use of solution of potassium arsenite in the treatment of chronic myelogenous leukemia. In 10 cases treated by them nine cases showed a rather striking reduction in the total white blood count and disappearance of immature cells from the peripheral circulation.

C. *Acute Infectious Mononucleosis or Benign Lymphadenosis*—This occurs in young adults. The male to female ration is 3-1. It is referred to in one medical clinic as the medical student's disease because of its frequent discovery as a result of the "flair" that medical students have for differential blood counts in diagnosing their own disorders.

CLINICAL FEATURES: Sore throat, at times with exudation and ulceration and ulcerations of tonsillar fossae, general adenopathy, fever and enlarged spleen. The average duration of the febrile period is two to three weeks. The incidence of several cases in boys' schools occurs too often to disregard the possibility of contact infection. The white blood count reported by Ordway and Gorham<sup>23</sup> as averaging 14,000, extremes 3,400—48,000 with lymphoid cells from 40 to 75 per cent. The predominant cell is larger than the lymphocyte, has a lobulated or kidney-shaped nucleus, finely reticulated and often eccentrically placed. It stains purplish with Wright's stain. The protoplasm is abundant, stains dark or light blue and has rather abundant azurophilic granulation. The cytoplasm often has a foamy, granular, mottled or frosted glass appearance and vacuolization is common. The cells are probably of lymphocytic origin.

DIFFERENTIAL DIAGNOSIS: (1) From acute leukemia by the absence of anemia, lack of hemorrhagic features and the generally good clinical condition of the patient. (2) From agranulosis by the higher white blood count and good clinical condition of the patient.

TREATMENT: Gargling with an oxidizing and local application of arsphenamine to the throat containing the Vincents organism is advocated. White<sup>24</sup> has suggested the use of the Roentgen ray on the cervical lymph nodes. In two cases, one treated by White and one by the author, there was rapid reduction in the size of the lymph glands and disappearance of the fever. It appeared as if the course of the disease was favorably modified. In the cases I have been able to follow there is usually a persistence of leucopenia and neutro-

penia after clinical recovery. It requires upwards of a six months' period before the blood again has a normal differential formula.

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(To Be Continued in Next Issue)

## Thrombophlebitis of the Lateral Sinus\*

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THIS subject includes two theoretically separate lesions; first, sinus phlebitis, or an infectious condition of the vein wall proper, involving and spreading beneath the inner coat; and secondly, thrombosis proper, or intra sinus erosion and clotting at the site of the lesion. Both of these entities serve as a focus from which periodic infection of the blood stream may take place. The signs and symptoms of these two conditions are identical. In fact, while they are theoretically separate entities, they usually occur together. In the scope of this paper they will be discussed together as "Thrombophlebitis of the Lateral Sinus."

Sinus thrombophlebitis was first described by Zaufal of Germany in 1880. His first operation for this condition was performed in 1884. While thrombophlebitis of the lateral sinus was recognized at least fifty years ago, it is only within the past 25 years that the rationality of the operative procedure has been universally accepted.

Most authors agree that involvement of the lateral sinus occurs in some 3 to 6 per cent of the operated cases of mastoiditis. Statistics from the Mayo Clinic show that during a period of 5 years there were found 19 cases in over 500 operated

mastoids (3.8%). Kopetzky's figures from Cornell Clinic show 25 cases of thrombosis in 126 cases of coalescent mastoiditis (20%). The Manhattan Eye, Ear and Throat Hospital gives a series of 566 mastoidectomies with only 11 cases of thrombosis (about 2%). The Massachusetts Eye and Ear Infirmary reports 19 cases out of 497 mastoidectomies (3.82%). Naftzger of Sioux City reports 6 cases in 192 mastoidectomies (3.12%). In our own small series we had 7 cases in 123 mastoidectomies (5.7%).

In almost all cases, sinus thrombophlebitis follows a suppurative process in the mastoid, though occasionally a severe otitis media may produce the condition directly without an intervening involvement of the mastoid. Probably the most common route of infection is direct extension from the temporal bone to the wall of the sinus. In most cases, demonstrable necrosis is evident in the caseous wall of the sinus. Occasionally the bony wall of the sinus is eroded, causing the dural covering to be bathed in pus and to be surrounded by granulations (perisinus abscess). Occasionally, infection may find its way directly through the system of small emissary veins of the mastoid portion of the temporal bone, or through those small veins which pierce the bone forming the floor of the middle ear. Also, there is the factor of

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trauma from operative work on the mastoid which accounts for a small proportion of the cases.

As to the pathology, the accepted view is that pus in the mastoid cells reaches the sinus wall in one of the ways described above. Spreading through the coats of the vein wall, the invading organism produces an infection of the intima, which may become eroded at one of several points, providing the means for periodic infection of the blood stream. Infection of the intima tends in time to produce an inflammatory reaction which is eventually surrounded by thrombotic deposit. In other words, thrombosis per se is to be regarded as a defense mechanism, nature's effort to circumscribe an infection entering the blood stream through a vein wall.

In septicemia of lateral sinus origin the bacteria are discharging intermittently and irregularly into the blood stream from the focus of infection. It is the reaction of the body to these invading organisms that gives rise to the characteristic symptoms, such as chills and fever. When the temperature in these cases has again reached normal, it is probable that the invading organisms have all been killed. The rapidity of death of the circulating micro-organisms may account for the fact that 40 to 60% of cases of thrombophlebitis with symptoms of systemic infection show a negative blood culture.

It is an accepted fact that the mortality is higher in cases of sinus phlebitis alone than when thrombosis is also present. An obliterating thrombophlebitis seems to indicate a less virulent organism or a strongly reacting individual which should naturally show a higher percentage of recoveries.

Most authorities agree that the hemolytic streptococcus is the invading organism in a very great majority of cases. Two writers interest me immensely.

According to an article by Dr. Mathew Ersner, Professor of Otology at Pennsylvania, published in the *Laryngoscope* in 1931, the organism invariably found in thrombophlebitis of the lateral sinus is the hemolytic streptococcus. In their entire large series of cases all positive cultures obtained were found to be due to the streptococcus hemolyticus. This statement is confirmed by personal communication from the author.

According to Dr. J. C. Keeler in his recent text-book on Otology, "other organisms than the hemolytic streptococcus have been isolated from time to time, but as far as I am aware no case where the infection proved to originate through

some other course or agent has ever been recorded."

This agrees with the observations in our small series, where in every case the organism was the hemolytic streptococcus.

The typical text-book picture of thrombosis of the lateral sinus is analagous to that of carcinoma of the stomach. The carcinoma patient with the classical symptoms of cachexia, vomiting of blood, epigastric tumor, anemia, and progressive loss of weight presents a familiar figure with a hopeless prognosis. The patient with the classical symptoms of repeated chills, sweats, high fever, cord-like jugular vein, papilloedema, metastatic abscesses, and white blood count of 50,000 or higher presents the picture of an advanced involvement of the lateral sinus with an operative mortality of over 50%. If diagnosed and treated early, before the classical symptoms have set in, nearly all cases of thrombophlebitis recover. Here is a field in which early diagnosis and early operation are the means of saving life. As Dr. Keeler aptly expressed it, "We all know that rigor mortis is a sure sign of death, but when attempting to resuscitate the drowned, we do not sit idly by, awaiting for it to occur."

In the scope of this paper I do not hope to present any new or startling facts about early sinus thrombophlebitis. I intend merely to give a brief resumé of seven cases of this condition that we have had within the past few years, with some of the lessons that we have learned from them. These conclusions are not given in any dogmatic sense, but with the hope that they will promote free discussion of the subject and that we may all benefit thereby. Unfortunately, cases made to order constitute by far the great minority and we are often called upon to diagnose this condition in the presence of several other possible sources for our symptoms. The seven cases which I shall report are presented because each presents a point or two in the early diagnosis of involvement of the lateral sinus.

The ensuing paper is divided into two sections, the first comprising the case reports, and the second a discussion based upon the clinical material recorded.

#### CASE 1—No. 11,387—R. S.

Patient is a boy of ten years who had an acute left otitis media seven years previously. He has had a chronic discharging ear since that time. He was brought in for examination because the parents noted that the aural discharge had developed a foul odor. He was found to have a normal

temperature, marginal perforation of the left drum, and a very slight discharge with a foul odor. Hearing was 10/20ths in the left ear. X-ray showed cloudiness and definite loss of cell structure in the left mastoid. The parents were told that the child had a chronic mastoid infection on the left side. Operation was advised, but the parents wished to postpone this for six weeks until school was out. In view of the long duration, and the child's excellent condition they were told that this might be done.

Four weeks later I was called to see this child at home. He was obviously acutely ill. Temperature was 104°. There was left mastoid tenderness, slight tenderness over the left jugular vein, slight stiffness of the neck. He was taken to the hospital and found to have a hemoglobin of 68%, w. b. c. 14,400. The next morning temperature was down to 100.4°, but at noon was up to 103°. A diagnosis of thrombosis of the left lateral sinus was made and immediate operation was decided upon. Under ether anesthesia the left internal jugular vein was exposed and ligated by Dr. Riggs just above the facial branch. The mastoid was opened and found to be filled with pus and granulation tissue. Bone was necrotic over the lateral sinus. The entire group of mastoid cells were cleaned out. The lateral sinus was exposed for one inch of its length and was found to be white, hard and definitely thrombosed. It was opened throughout one inch of its length and a tapering thrombus two and one-half inches in length was removed from the lower portion. There was free bleeding from both ends of the sinus. Hemorrhage was controlled with two No. 2 gauze sponges applied to separate ends of the sinus. Dressing applied. Culture of the lateral sinus showed a pure growth of streptococcus hemolyticus.

Convalescence was uneventful. After the second day the temperature remained below 101°, and was normal by the seventh day. Patient left the hospital on the twenty-first day. Wound healed slowly by granulation and was completely healed in six weeks. Ear drum healed completely. Patient gained twelve pounds during the summer and went back to school in the fall with hearing still 10/20th in the left ear. There has been no further discharge from this ear. This was very evidently a chronic mastoiditis due to some not especially virulent organism, which became re-infected with the current streptococcus hemolyticus with rapid thrombosis of the lateral sinus.

Special features of this case are the absence of chills, the low white blood count (14,400), the

low hemoglobin (68%), the relatively low temperature (out of proportion to the prostration of the patient), and the speedy recovery following prompt operation on the infected sinus. I call your attention to the fact that we ligated the jugular vein.

CASE 2—No. 11,300—*Miss L. T.*

Patient, a girl of seven yeears, who had left sided earache following influenza three weeks previously. She did not develop a discharging ear, but was treated by her local physician with diathermy to both ears. During the week before admission she had a "church steeple" temperature rising to 104 degrees after midnight and falling to normal the next morning. Examination showed a gray drum with the light reflex not present. There was no perforation, no aural discharge, no mastoid tenderness, no tenderness over the jugular. X-ray showed the left mastoid cloudy throughout with definite loss of cell structure. Patient was sent to the hospital for observation. For five days she continued to run a "church steeple" temperature up to 103 degrees daily. The peak came at irregular intervals but usually after midnight. Hemoglobin 60%, w. b. c. 10,800, urine negative. On the fifth day a diagnosis of thrombosis of the lateral sinus was definitely made on the temperature chart alone, no other symptoms developing.

At operation the left internal jugular vein was ligated by Dr. Riggs just above the facial branch. The mastoid was opened with mallet and chisel, and was found to be filled with pus and granulation tissue. The bone overlying the lateral sinus was definitely necrotic. The entire mastoid was cleaned out with curette and rongeur. The lateral sinus was exposed for about one and one-half inches of its length and was found to be definitely thrombosed. It was incised longitudinally for about one inch of its length, and a definitely organized clot was removed. This was followed by free bleeding from the ends of the sinus. Hemorrhage controlled with No. 2 gauze sponges at each end of the sinus showed colonies of streptococcus hemolyticus.

The convalescence was uneventful. The temperature gradually fell to normal by the seventh day post operative. Patient left hospital on the eighteenth day post operative, and was discharged to the care of her local physician. I saw her again two months later. The mastoid wound had healed completely. Hearing was 20/20ths, and the child was in excellent condition.

Special features of this case were the absence of discharging ear, absence of chills, low hemo-

globin (60%), low white count (10,000), relatively low temperature, lack of prostration of the patient, who felt remarkably well throughout, and the speedy recovery following operation. Perhaps we should have operated on this child sooner, but in view of the mildness of her symptoms we felt justified in waiting to establish a diagnosis.

CASE 3—No. 11,274—*J. W.*

Patient is a boy of seven years who had measles four weeks previously, followed by earache and a discharging left ear. Recently the parents noticed that the discharge had a foul odor. Examination showed a profuse, thin watery discharge from the left ear, central perforation of the drum and definite mastoid tenderness from antrum to tip. No tenderness on pressure over the jugular. Temperature 102.2°, hemoglobin 65%, w. b. c. 8,700. X-ray showed the left mastoid cloudy throughout, with obliteration of the cell structure. A diagnosis was made of mastoiditis, acute, suppurative, left.

At operation the left mastoid was found to be filled with pus and granulation tissue and to be definitely necrotic. The entire mastoid was cleaned out. Brain was not exposed. The lateral sinus was not exposed. Patient left the table in fair condition.

At four o'clock the next afternoon patient had a chill lasting fifteen minutes, followed by a temperature of 104.8. Hemoglobin was 62%, w. b. c. 9,500. At midnight patient had another chill, followed by temperature of 106, pulse 140. There was no tenderness over the jugular and no stiffness of the neck. A diagnosis of thrombosis of the left lateral sinus was made.

That morning patient was taken to the operating room and the left internal jugular vein was ligated by Dr. Riggs just above the facial branch. The mastoid wound was reopened. The lateral sinus was exposed backwards for about two and one-half inches and found to be hard, white, and definitely thrombosed. It was opened for about two inches of its length, and a tapering thrombus three inches in length was removed. Free bleeding was obtained from both ends of the sinus. The bleeding was controlled by No. 2 gauze sponge in each end of the wound. Patient left the table in fair condition.

Convalescence was uneventful. On the first day post operative temperature reached 102°. It gradually fell to normal in a week's time. Patient left the hospital on the nineteenth day post operative. Wound healed slowly by granulation, but was

entirely dry in two months. Patient went back to school that fall with drum entirely healed, and with hearing 20/20ths in each ear.

Special features in this case are that the thrombosis was not diagnosed pre-operatively; the lateral sinus was not uncovered at operation, but it should have been. Undoubtedly the thrombosis was present at that time, as there was no trauma to the sinus at operation. Other points to which I wish to call attention are the low hemoglobin (65%) and the low white count (8,700 and 9,500) in the presence of a definitely organized thrombus.

CASE 4—No. 12,296—*Mrs. G. H.*

Patient was a girl of 24 years, who came in complaining of pain in the left ear. She had had a left sided earache four days previously, and had had the left ear drum pierced with a needle by her local physician. It had drained slightly for four days, then ceased. On admission she had definite redness and bulging of the left ear drum with no mastoid tenderness. Under gas anaesthesia a wide incision was made in the posterior portion of the drum, and frank pus obtained. She was kept in bed for one week and the drainage cleared up. The ear drum healed completely. She was discharged from the hospital and allowed to return home. In six days she returned with the ear drum bulging again but no mastoid tenderness. The drum was again reopened and the patient put to bed in the hospital. At this time temperature was 99; hemoglobin 70%; w. b. c., 18,000. X-ray at this time showed a loss of detail in the cell outlines of the left mastoid. Patient was kept in bed for five days. On the fifth hospital day temperature was 101°; hemoglobin, 58%; w. b. c., 13,000. X-ray at this time showed definite loss of cell structure in the left mastoid. It was decided that mastoidectomy was advisable.

Under ether anaesthesia a routine simple mastoidectomy was done. The mastoid was found to be filled with granulation tissue but no frank pus. There was softening of the mastoid cells but no demonstrable frank necrosis. The brain was not exposed. The lateral sinus was not exposed, because it was covered with an apparently normal plate of bone. Culture from wound showed streptococcus hemolyticus.

Temperature remained high after operation—up to 103° daily. On the second day post operative there was a definite chill lasting twenty minutes, followed by a temperature up to 104.6°. Patient continued to have a high temperature up to 104° daily, coming at irregular intervals. Occasionally there were chills but usually there were

none. On the sixth day post operative hemoglobin was 49% (a drop of 20 degrees); w. b. c., 12,000. Blood culture was negative. A definite diagnosis of thrombosis of the left lateral sinus was made, and it was decided to operate.

Under ether anaesthesia the left internal jugular vein was ligated. The mastoid wound was re-opened, and the lateral sinus was uncovered for two and one-half inches of its length. It was found to be white, hard and completely thrombosed. The meninges in this region were covered by a deposit of fibrin and there was definitely an acute meningitis spreading from the region of the sinus. The sinus was opened with a clean knife and a thrombus three inches in length was removed by suction. Free bleeding was obtained from both ends of the sinus, and was controlled by a No. 2 gauze pack in each end of the wound.

The patient went on to develop the typical symptoms of a meningitis; stiff neck, dilated pupils, increased knee jerks, positive Kernig and Babinski signs. She continued to run a high pulse and a high, febrile temperature, and in spite of blood transfusions, died on the fifth day post operative.

This patient was poorly handled in three respects. First, she had three myringotomies at intervals of four and six days respectively. It is undoubtedly a fact that an ear which requires repeated myringotomies has a definite mastoiditis underlying the bulging ear drum. This should have been a point in favor of earlier mastoidectomy. Second, this patient was allowed to remain under observation in a hospital for a week. She was discharged and returned with the ear drum bulging again, and was allowed to remain under observation for five days more with an acute streptococcus mastoiditis before a mastoidectomy was done. Third, the lateral sinus should have been exposed at the time of the mastoidectomy, even though there was no real reason for suspecting it at the time. I call your attention here to the early low temperature with this infection, the low white blood count (13,000), the decreasing hemoglobin (70, 58, 49), the absence of chills and church steeple temperature, even while the thrombosis was well developed.

To me this case presents a good lesson of the value of early mastoidectomy in streptococcus mastoiditis, and the value of early exposure of the lateral sinus once thrombophlebitis is suspected.

CASE 5—No. 440—Miss J. A. M.

This patient was a child of four years, who had an acute sore throat, followed in twenty-four

hours by spontaneous rupture of the right ear drum. She was not seen by her physician until after rupture of the drum. The right ear discharged for two days, and then ceased. Five days later she developed an acute earache in the left ear. Examination at that time showed redness and bulging of the left drum with the right ear apparently normal. Myringotomy was done on the left side and frank pus was obtained. At nine o'clock the next morning the patient had a temperature of 106°, which subsided to normal that afternoon. There was no mastoid tenderness, and no tenderness over either jugular. She was taken to the hospital and found to have a hemoglobin of 70; w. b. c., 15,400; urine negative. For the next two days she had a temperature rising to 106° at different times each day, and falling to normal at intervals. Hemoglobin dropped to 64%; w. b. c. rose to 18,200. Besides our own group, she was seen in consultation by Dr. Ulrich, of Minneapolis, and Dr. Gregg, of Sioux Falls. The consultants agreed on a diagnosis of involvement of the lateral sinus. We did not have a spinal manometer but suspected the right sinus.

Under ether anaesthesia a routine simple mastoidectomy was performed on the right side. The right mastoid was found filled with pus and granulation tissue, and was cleaned out completely with curette. The lateral sinus was exposed. The lateral sinus was uncovered for one and one-half inches. It was found to have several small white patches, and had lost its shiny appearance, but did not have the definite appearance of thrombosis. A small hypodermic needle was inserted through the sinus wall and free venous blood obtained. It was decided that exposure of the sinus would probably clear up the periphlebitis, and that the conservative procedure was to close the wound. Accordingly the wound was closed over a rubber tissue drain. A simple mastoidectomy was then performed on the left side. It was found to contain pus and granulation tissue, but was not involved as markedly as the right side. The left lateral sinus was uncovered for about one inch, but appeared perfectly normal. This wound was closed over a rubber tissue drain with catgut sutures. Patient left the table in excellent condition.

Convalescence was uneventful. Patient ran a septic temperature for five days post operative, with the peak temperature lower each day. She had no transfusions or other special treatment, except a nourishing diet. Drainage from ears ceased in six days and both wounds completely healed in four weeks.

This is a typical case of phlebitis of the lateral sinus without thrombosis.

I call your attention to the relatively low white count (18,000 and 15,400) and the falling hemoglobin 70 to 64. This is the type of case which reacts remarkably well to uncovering of the lateral sinus only. There was absolutely no indication for ligation here. Dr. Lillie, of the Mayo Clinic, is one of the leading advocates for simply uncovering the vein in periphlebitis. Dr. Potts, of Omaha, advocates obliteration of the sinus lumen in this type of case. He says: "We expose the sinus until the normal sinus wall is uncovered at both ends, then block the distal and proximal ends in the usual way, take a roll of iodoform gauze the size of a lead pencil and gently pack this firmly into the sinus groove, obliterating the lumen from plug to plug, thus leaving the sinus empty."

However, this case is a good illustration that recovery from phlebitis alone is liable to be prompt with removal of the overlying mastoid cells and through exposure of the vein wall.

CASE 6—No. 1,555—Mrs. W. A. B.

Patient is a woman of 70 years who had a spontaneous rupture of the left ear drum following an earache of several hours duration. This ear continued to drain thin yellow pus, but there was no fever and no mastoid tenderness. Two weeks later she had a chill and a temperature of 105°. At that time she was taken to the hospital and a wide incision made in the posterior portion of the left ear drum. Her hemoglobin at that time was 84%; w. b. c., 6,450. Her temperature fell to normal and stayed normal for three weeks, except upon two occasions, when it rose to 103° and 104° respectively. She was kept in the hospital under observation, because she was known to be a mild diabetic. Under the direction of Dr. A. A. McLaurin, her blood sugar was kept below .182 with small doses of insulin. At the end of five weeks from the rupture of the drum and after three weeks in the hospital, her hemoglobin was 77%; w. b. c., 15,800. At this time she had another chill and her temperature rose to 102. X-ray showed some loss of cell structure of the left mastoid. It was decided to operate, with a diagnosis of subacute mastoiditis, left. Sinus thrombosis was considered, but was not definitely diagnosed.

Under gas-oxygen-ether anaesthesia the left mastoid was opened and found to contain a number of cells filled with thick, yellow pus under pressure. The entire mastoid was cleaned out.

The lateral sinus was exposed and found to be white, hard and definitely thrombosed. It was uncovered for one and one-half inches and appeared pathological throughout that length. It was incised with a clean knife but no blood could be obtained. It was decided that it would be unnecessary to ligate the jugular in the neck. The lateral sinus was opened for the length of one and one-half inches with a clean knife and an infected thrombus about two and one-half inches long was removed by suction. Free bleeding was obtained from both ends of the incision. Hemorrhage controlled with No. 2 gauze pack. Patient left the table in excellent condition. Culture from wound showed streptococcus hemolyticus.

Convalescence was uneventful. Temperature fell to normal within a few days. The ear drum was closed in a week and the mastoid wound healed within four weeks. Patient recovered completely and is now alive and well at the age of seventy-one. Her hearing was restored to 15/20ths in the left ear.

This case is a good example of thrombosis developing with very little in the way of suggestive symptoms. True, she had three chills in the course of six weeks, with temperature elevations to 103, 104 and 102° respectively. However, the hemoglobin fell only slightly (84% to 77%) and the white count did not rise above 15,800. Pre-operative diagnosis was not definitely made in this case, but fortunately thrombosis was suspected, so there was no delay at operation. This case is a good illustration of the fact that ligation of the internal jugular vein is a superfluous procedure, which I firmly believe will be discarded in the years to come. This case also furnished a good illustration of the fact that while diabetes undoubtedly increases the gravity of the prognosis, if efficiently handled it does not effect the course of the infection in any way.

Statistics show that sinus thrombosis is uncommon below the age of seven or above the age of forty, but here is a woman of seventy who developed it with very few suggestive symptoms, and who recovered promptly following operation, in spite of being a diabetic.

CASE 7—No. 2,057—Miss L. K.

Patient was a pupil nurse who had an acute right earache of twelve hours' duration. Myringotomy was done and frank pus obtained. She was kept in bed in the hospital with routine dry treatment. The right ear was drained profusely, but by the tenth day there was definite mastoid tenderness. Temperature rose to 101°; hemoglo-

bin, 81%; w. b. c., 12,600. X-ray showed a diffuse, cloudy decalcification of the cells of the right mastoid. On the twelfth day a simple mastoidectomy was performed. Under gas-oxygen-ether anaesthesia the right mastoid was opened, and was found to be filled completely with pus and granulation tissue. The lateral sinus was not uncovered, as there was no reason to suspect involvement of the same. Brain was not uncovered. Wound was closed over rubber tissue drain with chromic catgut sutures. Patient left table in excellent condition. Culture from wound showed streptococcus hemolyticus.

Following operation the patient continued to run a septic temperature up to 105 daily, with the peak temperature coming at irregular intervals. Hemoglobin five days later was 70% (a drop from 81%); w. b. c., 18,500. A diagnosis of involvement of the lateral sinus was made, and it was decided to expose it.

On the fifth post operative day, under gas-oxygen-ether anaesthesia, the mastoid wound was reopened. The lateral sinus was uncovered for one and one-half inches. The sinus wall was found to be gray and showed a definite periphlebitis. There did not appear to be any obstruction to the lumen. The sinus wall was inadvertently opened by a rongeur at the lower part of the wound, with considerable free bleeding. Bleeding controlled by gauze packing. A needle was inserted into the upper part of the sinus wall and free blood obtained. The incision in the sinus wall was increased so as to be about one inch in length. Hemorrhage was controlled with two 3-inch gauze packs. Skin incision was not sutured. Patient left the table in excellent condition.

The first day post-operative there was a chill and a rise of temperature to 104 degrees. The temperature gradually fell within two days to below 100° and remained there for eight days. The packing of the wound was changed twice, at three day intervals, under gas anaesthesia. The only annoying symptom was profuse hemorrhage from the upper end of the sinus wound at each dressing.

After five days of practically normal temperature, and on the eighth day post operative, there was a chill with rise of temperature to 105 degrees. For nine days thereafter there was a daily chill with rise of temperature to 105 and 106 degrees. Patient appeared acutely toxic. Dressings were changed every third day, and each time with profuse hemorrhage from the upper end of the incision. Hemoglobin fell to 57%; w. b. c., fell to 8,700.

On the eleventh day post operative, at the time of the wound dressing, under gas anaesthesia, the right internal jugular vein was ligated by Dr. Riggs, but this procedure was without immediate effect, as the chills and high temperature continued for five days thereafter. Two blood transfusions of 500 cc. of citrated blood were given by Dr. Jewett. Since hemorrhage from the upper end of the sinus wound continued at dressings, there was a great temptation to uncover the lateral sinus back to the torcular Herophili, in order to be able to make pressure on uninfected tissue—normal vein wall to normal vein wall to secure clotting. However, this was not done. Finally, on the seventeenth day post operative—two days after the second blood transfusion—temperature fell to normal. There was no hemorrhage from the wound at dressing and patient began to recover. In another week hemoglobin was up to 70%; w. b. c., 8,500. Patient had a long, uneventful convalescence and now, after three months, is completely recovered. The wound has healed and hearing is practically 20/20ths in this ear.

This case is interesting in that it illustrates the point that sinus phlebitis without thrombosis is often more severe than when a definite clot is formed. Thrombus formation is a sign of good systematic reaction to the infection with attempting walling off of the same.

I believe that in this case we did not uncover the vein wall far enough back to place our packs on normal vein wall. Beck, of Vienna, has shown experimentally that no clot forms in a vein at the site of an endophlebitis, and that the endophlebitis can extend back beyond the area macroscopically discernible as diseased. It follows that when such a condition is present, immediate efforts should be made to work farther back along the wall of the vein and seek obliteration of the lumen at a spot more distant from the site of the infection. If the church steeple temperature had continued in this case, I believe we should have uncovered the sinus clear back to the torcular Herophilli to plug off the vein beyond the diseased area.

I doubt that ligation of the jugular in this case had a great deal to do with recovery. The blood transfusions were undoubtedly of very great benefit. While I do not believe they reacted directly on the infection, by raising the patient's general systematic condition they were of incalculable assistance in enabling her to fight off the invading organisms, and probably tipped the balance in favor of recovery.

To sum up briefly, local signs of lateral sinus

involvement are more often absent than not. In our series, the diagnosis of sinus thrombophlebitis was made mostly on a careful history of the case plus the temperature chart. A few other conditions give a similar temperature chart and these must be ruled out. In this locality, malaria may be disregarded. It is essential that septic endocarditis, pneumonia, and pyelitis be excluded, although in none of these does the temperature curve drop back to normal between elevations, and in none of these is the peak temperature liable to come at a different hour each day. Also, as shown by two of our cases, definite thrombosis can and does occur without chills, sweats, and church steeple temperature.

A routine blood culture is a worth while procedure, but in 60 per cent of cases it will be negative. We did not secure a positive blood culture in our series.

Headache is often mentioned in the textbooks as a cardinal symptom. We did not find it so. Several of our cases complained of occasional headache, but it was not a constant symptom, and when present it was impossible to distinguish it from the pain of the mastoid infection. Most of them had no headache at all. Dr. Richard Atkins, of the New York Eye and Ear Infirmary, in reporting a series of forty cases, says headache was present in 30 per cent.

Some observers wax enthusiastic over changes in the ocular fundi. However, Benedict, of the Mayo Clinic, says that it appears in less than 10 per cent of cases, and that it was present in cases of sinus thrombosis at the Mayo Clinic only when the patients were extremely ill and went on to death. In none of our seven cases, either pre-operatively or post-operatively, was there any evidence of choked disc to one not unduly anxious to find something of significance in the eye grounds.

A progressive diminution in hemoglobin after mastoid exenteration points to invasion of the lateral sinus. The presence of a hemolytic organism causes reduction of hemoglobin, as it is this constituent which furnishes food. The presence of this organism before mastoidectomy will, of course, cause a reduced hemoglobin. However, after mastoidectomy, hemoglobin should rise again, indicating that the infection has been controlled. In every case in our series there was a progressively increasing secondary anemia of from 7 to 30 points, which began to improve coincident with control of the lateral sinus infection.

It is the opinion of most text-book authors and

apparently of most writers in the current literature that, excepting septic endocarditis, sinus thrombophlebitis is accompanied by a higher leucocyte count than any acute inflammatory reaction to which the body is subject. We have not found this to be the case. In our series, the white blood count varied from 6,450 to 18,200, with an average of 15,200. Judging from cases seen previously, during internship, I believe that the high white counts are found in the cases that have been allowed to progress into the second and third stages, with disintegration of the thrombus and metastases to brain, lung, muscle, and synovial membranes.

Authorities differ as to the time element involved. Most observers state that sinus thrombosis occurs usually as a result of long continued chronic infection. Dr. Atkins, of the New York Eye and Ear Infirmary, states that 75 per cent followed acute suppuration in the middle ear. In our series, one case had had a discharging ear for seven years. The others followed acute suppurative conditions (all hemolytic streptococci). The shortest time from onset of earache to diagnosis of sinus involvement was seven days. The longest time was thirty-five days. The average was twenty-two days.

As for ligation of the internal jugular vein, there is no time here for a lengthy discussion of this phase of the subject. I realize that the weight of authority and tradition are in favor of ligation of the internal jugular vein. In our earlier cases, as you have heard, we practiced it ourselves. Recently more and more otologists have come to believe that this is a superfluous procedure. In a very excellent recent paper, Dr. O. M. Rott, of Spokane, reviews the literature on this subject, and quotes statistics on several hundred cases, in which it was noted that the results were just as good without ligation as with it. In other words, ligation of the jugular vein is not a factor in the outcome.

It is true that after ligation one has a feeling of security in knowing that all that has been advocated has been done, even though death supervene; whereas if ligation is not performed one has to face the criticism of colleagues who might think differently about the method adopted. However, I am willing to put on record my belief that ligation is a superfluous procedure, and present here two cases where it was not done, with speedy recovery, one of them a 70-year-old diabetic.

Speedy recovery following prompt operation is the rule. Ballenger, in his text book, says: "If diagnosed and operated upon in the first stage,

before metastatic extension to brain, lungs and liver have occurred, fully 50 per cent will recover. Whereas, if diagnosed in the third stage, after the classical symptoms have set in, the mortality rate is very much higher." In actual figures, Dr. Richard Atkins, of New York Eye and Ear Infirmary, gives 27½ per cent mortality in forty cases. Dr. Potts, of Omaha, gives 14 per cent in the Gifford group at Omaha in 63 cases. Dr. MacCuen Smith, of Philadelphia, says, "The usual case of sinus thrombosis is generally fatal unless relieved by surgical intervention." Dr. Edward Dench, of New York, gives 28 per cent in his series. In our series we had one death in seven cases, a mortality of 14.3 per cent.

If this paper has any appeal, it is for prompt operation on cases of acute mastoiditis where the hemolytic streptococcus is the invading organism, with early exposure of the lateral sinus, if exces-

sively high fever give cause to suspect involvement of same. We feel that awaiting the development of the classical symptoms of thrombophlebitis is gambling with the life of the patient, is subjecting him to a steadily increasing mortality risk, and is the radical instead of the conservative procedure. We cannot emphasize too strongly that "it is better judgment to diagnose thrombophlebitis on moderate symptoms and an exploratory procedure rather than to await the development of the classical symptoms, only to find the infection has spread beyond our control."

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## Incidence and Focal Infection in Acute Sinus Diseases and Treatment\*

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**R**HINOLOGISTS reluctantly admit that the fundamentals of sinus infection are still obscure. Likewise the proper methods of treatment is a subject constantly debated because the exact pathological condition is difficult to determine.

Proetz says, "We know little about sinuses, and only exert a feeble influence upon their welfare."

Progress is being made, however, and we can be assured that the rhinological studies now being conducted in the clinics and laboratories is going to make diagnosis easier and treatments more rational and effective.

Such new phases, as allergy, etc., while now confusing will, when better understood, be a step forward and guide us away from errors too frequently committed both as to diagnosis and treatment.

From my observations I believe these errors occur most frequently in the acute stages of sinus troubles. Perhaps we have improperly evaluated sinus defense such for instance as ciliary function, restoring necessary vitamins, hygiene, etc.,

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and too frequently we overlook the co-operation of the Internist.

Why and in what manner the sinus infection is carried to other organs is not yet made clear nor is the incidence of this occurrence determined. We are beginning to understand why such pathology as hyperplastic degeneration is conducive to neighboring tissue and blood stream pollution but very little is known of the acute congestion type or the ordinary subacute sinus empyema.

Focal infection has received its share of study and stress. In fact we became over enthusiastic, throwing overboard all caution in our surgical energy to eradicate suspected foci. However clinical analysis showed the error of our ways. The Mayo Clinic found little significance in the ordinary suppurative sinus as a foci for general infection. Such men as Mosher, Shambaugh, White and Lille showed that the posterior sinuses had little relation to retrobulbar neuritis. If the findings of these clinicians are true that the subacute or suppurative type of sinuses are only minor factors as foci of infection then our methods of treatment must be more conservative.

On the other hand acute congestive sinusitis

has had much less attention both in literature and clinically. The reason for this is that they are rarely hospitalized nor do they seek relief at clinics.

They are perhaps most frequently seen by the Pediatricist where they come for relief from general disturbances, the most frequent of these being nephrosis. Clausen and Marriott both speak of the frequency of the association of sinusitis and nephrosis. The etiologic factor is generally believed to be a toxin rather than bacteria in the blood stream. For good anatomic reasons bacteria rarely enter the blood stream from the sinuses unless the lining is ruptured or destroyed.

It is my conviction that it would profit us more to turn our attention to the study of acute sinus conditions instead of overemphasizing the chronic lesions.

We all are familiar with the extreme prostration following a severe head cold. Now the internist is calling attention to the frequency of kidney complications especially in the young.

Since we have adopted the routine of a urinalysis on all acute sinus congestions a greater percentage of albuminuric cases have been discovered than we had heretofore suspected, whether these were of bacteric origin or toxic we did not determine. In a series of thirty successive cases we found five nephritic. Of these, two were of the glomerular type. All cleared promptly as soon as the sinus inflammation subsided.

Marriott calls attention to the frequent manifestation of infection in the sinuses in children having tubular and glomerular nephritis. He further points out that the great majority of these are of the prechronic sinus type and easily yield to conservative treatment. Both Dean and Clausen have emphasized the importance of sinus infection as the frequent cause of nephritis in the young and the fact that only a small portion are ever seen by the laryngologist. McCullagh very tersely points out our oversight when only twenty-two cases of child sinusitis are admitted in one year at Manhattan Hospital when the total admission of adult cases to the nose and throat wards were over twenty-two thousand. Again I think the reason is that children are rarely sufferers of the chronic type of sinus lesions. They recover readily under ordinary care, the great majority with the ministrations of the family physician only. However a great number will go to chronicity and permanent damages.

It is difficult to differentiate between acute coryza and acute sinusitis. But both may be regarded as potential factors in causing general

disturbances and no doubt the chronic lesion was once a common coryza.

In my apprentice days a severe head cold had little significance, nor had the rhinologist much to offer in the way of relief for those with acute sinus indications. Nothing was known of focal infection.

Notwithstanding many of the pessimistic statements made I believe we have made considerable progress as regards treatment. We are beginning to understand the pathology and what is better we have a clearer conception of sinus histology and function.

We have gone a long way in the study of the chronic sinus and repair of same after mutilation.

In the treatment of the acute sinus we now regard every coryza or severe head cold as serious, and endeavor to convince the patient of this as well, and we are satisfied that we have made some progress. In contrast to olden days we feel that we have something satisfactory to offer our acute coryza cases; relief of their discomfort and a knowledge on our part that we have averted a possible serious complication. The proof of this is a great increase of our clientele of this particular type. Furthermore a number of our general practitioners and internists are now cooperating with us and thus advancing our cause—that of early treatment of acute sinus disease.

Our treatment is simple but we think satisfactory. It consists in the early stages of a daily nasal pack. While a number of different medications have been offered, we confine ourselves to the use of ichthylol for the office use. The nose is prepared with cocaine and adrenalin, and the ichthylol pack is 10 per cent in glycerin. As the different nasal packs are well known we choose not to go into detail, but we have noted that the "acute" nose is very sensitive, hence the cocaine and the careful placing of well saturated pack about the upper regions of the nostril in juxtaposition to the sinus openings. The hygroscopic action of the ichthol and glycerine aids the discharge of these cavities, and in our opinion promotes the function of the cilia and mucin. Children readily submit to this treatment and in course of it learn to tolerate intranasal manipulation, which accomplishment we consider of great value, if operative measures are necessary later. If complications arise we promptly enlist the cooperation of the internist.

Diathermy has been thoroughly tried out by us and found of no great benefit.

Other parts of the respiratory tract is kept un-

der surveillance and the part tonsils and adenoid tissue which might contribute to our complications is noted. So long as tonsils remain the focal infection guilt is, of course, in doubt.

Ephedrine we know is in great favor, but aside from bronchial invasion we use it only on occasion. Dean and his associates stress the use of 1 per cent ephedrine in their practice in the young. They also keep in mind the possibility of the allergic basis for the trouble. Dean mentions the frequent association of polyps in the allergic cases. No reason is advanced for this, however.

Due consideration must be given to the general

systemic condition, but will not be attempted in this brief paper.

As to operative measures we subscribe to the conservative issue of the question. We believe it is rarely necessary in acute cases. Empyemas are promptly drained when found, however, and they are most frequently found in the antra.

It is worth while to repeat what Eugene Lewis has said, that "When we attempt to relieve acute nasal distress, the relief is of no value unless coupled with preservation of highly specialized cells and structural arrangement necessary to meet subsequent functional demands."

## Traumatic Surgery of the Rectum\*

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**A**CCIDENTAL injuries to the rectum are not particularly uncommon, but no one physician sees a great many cases. For this reason there is no generally accepted treatment for these injuries. In severe injuries the life of the patient often depends upon promptly determining the extent of the injury and instituting proper treatment without delay. The expectant treatment as a routine method in severe rectal impurities will result in many needless deaths. Likewise in industrial cases, proper care may save unnecessary and expensive litigation. With these things in mind, a short survey of this subject is presented for your consideration.

The most common type of injury is perforation by foreign bodies. Perforation may occur from within the rectum outwards or visa versa. Perforations occurring from within outwards are due to objects which have been swallowed and passed through the intestinal tract into the rectum, or objects inserted into the rectum. Swallowed foreign bodies are usually ingested accidentally, though in the case of children or insane persons or "side show" performers, it may be done purposely. Spicules of bone are the most commonly ingested objects, but pins, nails, pieces of wood, bits of glass, silverware, and other objects are not uncommon. In the majority of these cases the swallowed object, even the quite large, passes through the intestinal tract and is expelled per anum without trouble. In most cases where this does not occur, the object becomes arrested

in the rectum the other portions of the bowel may be involved. This is particularly true where the object is elongated and has a sharp point. The crypts of Morgagni are the most common site to engage the point of these objects, especially if the foreign body is not a large one. Larger objects may be stopped by the valves of Houston. When the object is caught in the crypt of Morgagni and the wall pierced or deeply injured, a perirectal abscess results. This should be operated in the usual way, and uniformly good results may be expected. In the rarer cases where the object becomes engaged higher up, as behind a valve of Houston, the resulting abscess is of a more serious nature. In this case the internal opening of the resulting fistula lies above the sphincter muscles, and hence offers a more serious problem. Still more rarely, perforation may occur in the sigmoid and hence above the reflection of the abdominal peritoneum. In this event there is the added complication of peritonitis, which is a very serious matter. Legally, this type of case is of importance if the perforation is due to some object swallowed in the course of the patient's occupation, or as occasionally the case, ingested with food eaten in a public eating place.

Other cases of this type of injury are those due to foreign bodies which are inserted into the rectum. In adults it is usually done to produce sexual excitement, as a supposed cure for rectal disease, or by insane persons. Children, perhaps through curiosity, or natural inquisitiveness, sometimes insert objects into the rectum. Practical jokers also often resort to this practice. This

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most often occurs during a drinking party, so bottles and glasses are frequently used. In connection with injury caused by inserted articles, the use of glass and hard rubber enema tips should be mentioned. These have frequently resulted in severe injury. To me these injuries seem totally uncalled for, as there is no good reason for using inflexible enema tips. Soft rubber tips or soft rubber catheters should be insisted upon by all physicians.

While an almost inexhaustible list of objects have been inserted into the rectum, serious results occur only in a small percentage of cases. This is probably because the rectum is quite capacious and relatively mobile. Unless the article is sharp or undue force is used, or the object is allowed to remain in the rectum for some time, and so produce injury by pressure, no serious damage is done. There are enough cases, however, which result seriously, to keep the physician on his guard.

The second type of foreign body perforation is that of perforation from without. In these cases the object perforates the tissues outside the rectum, and then penetrates the rectal wall from without inwards. The point of the object may stop within the rectum, or it may pass on, transfixing the rectal wall again and penetrating the body for variable distances. This type of injury most frequently follows sitting or falling upon some elongated object. If the object is sharp-pointed, it will likely perforate the external tissues at the point first encountered, and then pass on through the rectal wall. If, however, the end of the object is somewhat rounded and the force not so great, it is likely to follow around the natural contour of the buttocks, and bony contour of pelvis, and enter the rectum through or near the anus. In this case the external injury is likely to be slight, but the internal damage may be severe. Pitchforks, mop handles, iron bars, legs of chairs, broom handles, nails, coupling pins, tree branches, and weed stumps are among the objects mentioned. I have seen two severe cases of this type. The first was the case of a boy fourteen years old who was playing football on a vacant lot. During play he was bowled over backward, sitting on a sharp stump of a large weed about six inches long. The weed entered the rectum through the anus, producing a slight abrasion in the anal wall. Some blood was passed from the rectum at the time of injury, but the patient was not seen until twenty-four hours later. At this time he had passed some blood tinged urine, and complained of some low ab-

dominal pain. His temperature was 102 degrees, pulse 110 and W.B.C. 21000. Protoscopic examination revealed a tear in the rectal mucosa on the anterior wall of the rectum about one inch above the prostate. We felt that the patient had a bladder injury; that the weed had probably penetrated lower most part of the peritoneal cavity, and a localized peritonitis was present. However, since twenty-four hours had elapsed and the patient's condition seemed good, we decided to wait, and nothing was done. The bloody urine continued five days, but his condition continued to improve, and he was discharged from the hospital on the ninth day without any operation having been done.

The second was a compensation case, some eighteen months after the injury. In this case the man was working in a box car. In getting out of the car he fell, alighting on a crowbar which was upright in the ground. The crowbar penetrated the rectum for six or eight inches, passing into the peritoneal cavity, carrying pieces of clothing with it, and injuring a loop of small bowel. The case was seen by Doctor B. J. Branton, of Willmar, who immediately opened the abdomen, removed the foreign material, closed the injured bowel and inserted two drains. After a stormy convalescence, the patient recovered, and was discharged from the hospital. He complained of pain on defecation and pelvic distress, and a feeling that he could not control his stool. The insurance company referred him to Doctor E. O. Voyer, who in turn had me examine him. Protoscopic examination showed his anus to dilate readily and that muscle tone was good. One and one-half inches from the anus in the anterior midline of the rectum, was a scar extending upward and to the left for one and one-half inches. This was well healed. There were some internal hemorrhoids. Otherwise the rectal findings were negative. I could not help but feel that an important factor in the patient's discomfort was the fact that he was receiving compensation. He continued to complain, so his abdomen was later opened by Doctor Voyer, who reported numerous adhesions about the sigmoid. The last report was that he was improved but not entirely relieved of his symptoms.

Another type of rectal injury is perforation by the pelvic bones in severe fractures of the pelvis. These cases are usually severe crushing injuries complicated by injury to the bladder and other viscera. Gun shot wounds are encountered now and then, but are quite uncommon in civil life, and relatively so, in war. When seen they are frequently accompanied by injury to the bladder

and other pelvic organs. Hirschman reports a case of a boy twelve years old who was accidentally shot with a shot gun. The buttocks were perforated, and a portion of the urethra shot away, and the rectum severed just below its junction with the sigmoid. The sphincters and levators were destroyed, and there were thirty odd bullet wounds from which urine, pus and feces were exuding. A permanent colostomy was done, some of the shot removed and the defect in the urethra filled in with a piece of viable rectal mucosa. Recovery followed with a functioning urethra. McKenney reports two cases of rectal injury resulting in sloughing of perirectal tissues, as results of kicks administered by loving husband in a moment of irritation. Recovery was recorded in both cases, but one woman lost a third of her sphincter muscle due to the sloughing.

Ruptures of the rectum are also a fairly frequent type of injury. These are divided into a spontaneous and traumatic group. The spontaneous cases are those following straining at defecation, or those which occasionally occur from no apparent cause. The rectal walls usually appear normal, though in one case, a diverticulum was found at the site of perforation. The walls were thin and showed an absence of muscle fibers. Naturally, any inflammatory process, or other weaknesses of the bowel wall would predispose to this type of injury. Occasionally, in these cases a loop of small bowel will prolapse through the rent and protrude through the anus.

Traumatic rupture usually follows crushing injuries to the abdomen or pelvis, the strain due to heavy lifting, or the use of compressed air hose. These injuries frequently come under the head of "occupational injuries." Rupture due to compressed air from an air hose, is usually due to some practical joker or its use by some careless worker. If the hose is placed even near the anus a ruptured bowel is likely to result. This rupture most often occurs in the pelvic colon, since this is the first mobile portion of the gut, and so is the first place to temporarily trap the incoming air. However, in a series of thirteen cases, three ruptures occurred in the rectum proper. In conclusion, we must mention the cases of rupture due to the proctoscope. These cases are rare, but still too common. They usually occur in cases where the bowel is friable from disease, though the rupture of normal rectums have been reported a number of times. It usually results from the proctoscope itself, though over-inflating the bowel may be the cause. It is well to remember that no

physician is skilled enough to pass a twenty-five centimeter proctoscope its full length on every patient. When it becomes evident, because of angulation or fixation of the bowel or disease of its wall, that the instrument cannot be passed without undue force, the physician should cease his efforts and rely upon other methods of examination.

When a person presents himself with a rectal injury there are several things to consider. First is the history of the case. This is important, though it may often be misleading, due to the excitement of the narrator. In case of perforation wounds, the object causing the injury has frequently been withdrawn. In this case, if the size of the object, depth of penetration and angle of entrance can be ascertained, it is of value. Unfortunately, the stories of the onlookers usually have to be discounted and the object itself is frequently left at the place where the injury occurred.

Second is the appearance of the wound. This again may be misleading. A very large ragged and seemingly serious wound may be quite superficial, at least entirely below the peritoneal reflection, and so be fraught with little danger. On the other hand, an elongated object may pass far into the body with only a small external injury. A striking illustration of this is the history of a Federal general during the Civil War. He was retreating from the enemy and leaning forward on the back of his horse as he rode. He was killed and no evidence of wound could be found so it was thought he had died from fright. As he was being prepared for burial, a small abrasion was noted at the anal margin. Examination revealed that a bullet had entered the anus, ranged upward and pierced his heart.

Third must be considered the general condition of the patient. In case of severe injuries, especially those involving adjacent organs, or the abdominal cavity, symptoms of shock are present—rapid thready pulse, cold clammy skin, etc. These symptoms are not present unless there is severe injury, but one must be sure that these symptoms are not produced by some concomitant injury, rather than the injury to the rectum.

With this knowledge as a basis, more detailed examination should be made. The most important fact to determine is whether or not the injury involves the peritoneal cavity and its contents or any organs adjacent to the rectum. External wounds may be laid open and retracted and their depths carefully sounded. This will usually tell us whether the peritoneal cavity is opened or the

bladder, etc., injured. Proctoscopic examination should always be done and any perforation in the bowel wall can usually be seen. Usually the proctoscope can be passed for 20 to 25 cm. Injuries occurring above this distance must be determined by other methods.

If it can be definitely determined that all injury lies below the peritoneal reflection the case is best dealt with by removing all foreign material and dead tissue and establishing adequate drainage. In case of severed sphincters, primary repair is always worth trying. It is not always successful but nature is surprisingly kind in this location.

In a second group, perforation of the rectum has occurred below the peritoneal reflection but the object has passed on, later entering the peritoneal cavity. If seen immediately after injury an exploratory abdominal operation is usually indicated. This allows definite knowledge of injury to the abdominal viscera, the removal of any foreign material, closure of the peritoneal rent and establishing of drainage. If not seen until twenty-four hours or more later, and the patient is not evidencing severe abdominal symptoms, an expectant treatment may be advisable. In this case the chances are that the intestine has not been injured and that only a small area of pelvic peritonitis is occurring around the site of perforation. This is likely to be walled off by the omentum and intestinal loops and we are justified in watchful waiting. If severe abdominal symptoms are present, exploration is not only justifiable but imperative.

In the third group of cases where perforation of the bowel has occurred above the peritoneal reflection, immediate laparotomy is indicated, whether the case is seen early or late. The majority of the air hose group come in this category. If these cases are operated immediately after in-

jury about fifty per cent recover. The bowel should be sutured and drainage established. If operated later the mortality rate is very high, probably over ninety per cent.

In conclusion then it may be said that in rectal injuries it is extremely important that an immediate diagnosis be made. To secure the best results, it must be determined at once whether or not there is an injury to the peritoneal cavity or adjacent organs, particularly the bladder. The extent of the external injury is no criterion on this point, nor does the absence of shock and hemorrhage definitely rule out a peritoneal injury. The things most helpful are the history of the case, careful examination of external wounds, careful proctoscopic examination, with examination of any wounds appearing in the walls of the rectum, and the general condition of the patient. With these things in mind, mistakes in diagnosis should be fewer. Removal of foreign material and dead tissues, and giving adequate drainage is the best method of treatment in those injuries occurring below the peritoneal reflection. Immediate abdominal operation with repair of the injured bowel, followed usually by drainage or colostomy, is the best treatment where the perforation occurs above the peritoneal reflection.

Anti-tetanic serum, blood transfusions and other general measures should be used as indicated.

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## A Review of Gall Bladder Surgery at St. Mary's Hospital, Minneapolis, from January 1, 1921, to January 1, 1931\*

MARVIN SUKOV, M.D.

*Iowa City, Iowa*

**D**URING the last ten years at St. Mary's Hospital, there were 656 surgical cases of diseases of the gall bladder and its ducts. These ranged in age from 5 years to 81 years, with the greatest incidence in the fifth decade and

\*Read before the annual alumni homecoming meeting at St. Mary's Hospital, Minneapolis.

a preponderance in the female sex in almost a four to one ratio. Of this group 292 presented cholelithiasis; here the age incidence shifted somewhat to the right, the greatest coming in the sixth decade between the ages of 50 and 60. There was only one case under 16 years of age and that

was hydrops of the gall bladder in a boy of five. The following table shows the age distribution for males, females in the general group as well as the distribution for cholelithiasis.

Age	Male	Female	Combined Male and Female	Lithiasis
5-20	1	6	7	1
21-30	19	76	95	28
31-40	22	126	148	61
41-50	36	130	166	80
51-60	28	122	150	82
61-70	32	50	82	36
71-80	1	4	5	3
81-90	1	2	3	1
Total	140	516	656	292
Per Cent	21.5	78.5	100	44.5

X-Ray studies were made at the hospital in 26 per cent of the cases previous to operation.

- 77 Cases showed definite pathology,
- 36 Were reported questionable,
- 28 Showed stones,
- 29 Came back with negative X-Ray findings,
- 1 Case, which later proved to be a sarcoma, was reported "gall bladder calcified."

This makes the total of X-Ray studies 171 or 26 per cent of the total.

The choice of an anaesthetic varied widely with the general trend toward local and the closed method of gas anaesthesia. Spinal anaesthesia has been used in 18 cases, in 6 of which it had to be supplemented with one of the gas anaesthetics.

In the following table are indicated the various anaesthetics and the number of cases in which each was employed.

½ Per Cent Novocaine	109
1 Per Cent Novocaine	99
Ethylene	95
Local and Gas	84
Nitrous Oxide and Ether	80
Ethylene and Ether	67
Ether	44
Nitrous Oxide	38
Spinal	12
Spinal and Gas	6
2 Per Cent Novocaine	2
Spinal and Local	2
Sodium Amytal and Gas	2
Ether and Chloroform	1
Salicaine	1
No Anaesthetic Reported	14

The accompanying table shows the clinical diagnosis established at operation and by a coincidence the cases of chronic cholecystitis exactly equal in number those of chronic cholelithiasis, while those of acute cholecystitis equal those of acute cholecystitis with lithiasis.

Chronic Cholecystitis	285
Chronic Cholecystitis with Lithiasis	285
Empyema	18
Common Duct Obstruction	18
Perforated Gall Bladder	13
Acute Cholecystitis	8
Acute Cholecystitis with Lithiasis	8
Hydrops	5
Gangrene	5
Cystic Duct Obstruction	4
Carcinoma of Gall Bladder	4
Carcinoma of Pancreas	4

Clinically, we did not classify the cases into

mild chronic or marked chronic, but divided them only as to chronic cholecystitis or chronic cholecystitis with lithiasis.

In view of the fact that the report from the pathologist was sometimes at variance with that of the surgeon, we include a summary of the pathological diagnosis.

Chronic Cholecystitis with Lithiasis	289
Chronic Cholecystitis without Lithiasis	161
Mild Chronic Cholecystitis	92
No Pathology Demonstrated	36
Marked Chronic Cholecystitis	9
Acute Cholecystitis with Lithiasis	8
Gangrene	5
Acute Cholecystitis	4
Ruptured Gall Bladder	3
Carcinoma of Gall Bladder	2
Sarcoma of Gall Bladder	1
No Report	38
Appendix Inactive	122
Pathological Appendix	20

Here we have 36 cases, or 5.4 per cent of the total, that present clinical symptoms of a diseased gall bladder but in which no pathology was demonstrated. Most of the specimens in this group were examined grossly, although on some, microscopic and bacteriologic studies were made. A finer classification is also made based on the degree of involvement.

The 38 unreported cases represent chiefly instances of cholecystotomy or exploratory operations in which no specimen was submitted to the laboratory.

During the operation a number of concomitant pathological conditions were encountered. Some required surgical intervention, while others had a marked influence on the prognosis but could not be treated surgically. The more common or important cases are here given:

Pathological Appendix	123
Chronic Pancreatitis	8
Hepatitis	7
Acute Appendicitis	4
Acute Pancreatitis	2
Partial Intestinal Obstruction	2
Duodenal Ulcer	2
Peritonitis	1
Liver Abscess	1
Cholangitis	1
Hypertrophied Pylorus	1
Ruptured Duodenal Ulcer	1

Of the 656 operations performed, by far the greatest number, about 83 per cent, were cholecystectomies, with cholecystotomies making 12 per cent of the total. Although we have not the percentage year distribution for cholecystotomy, it has nevertheless showed a marked decline as a procedure the last five years compared to the first five years in our series. We wish to add that 18 patients or 22.5 per cent on whom cholecystotomy was performed at this hospital during the past 10 years, have returned for further surgery nearly all within the first 2 years, to be treated with cholecystectomy.

Out of the eighteen cases

- 10 Returned within 1 Year
- 5 Returned within 2 Years
- 1 Returned within 3 Years
- 1 Returned within 4 Years
- 1 Returned within 5 Years

Here is a list of the operations performed in all cases.

Operation	Number	Per Cent
Cholecystectomy	357	54
Cholecystectomy and Appendectomy	188	28.5
Cholecystotomy	80	11
Cholecystectomy and Cholecocotomy	10	1.5
Exploratory	7	1
Other Operations	10	1.5

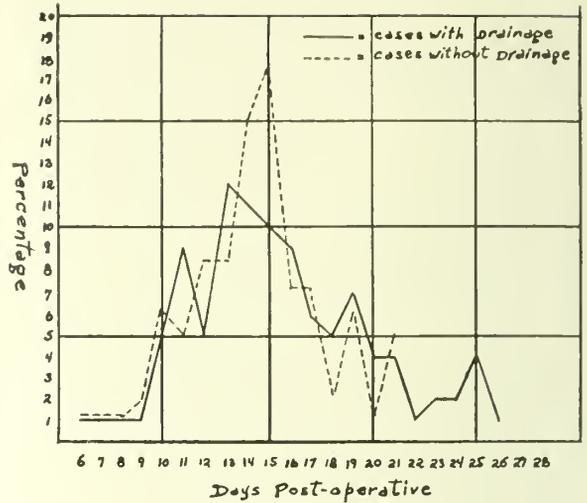
In uncomplicated cases, of those treated by cholecystectomy the average stay in the hospital following operation was 14 days. Where a drain was employed it was completely removed within 4 to 20 days; 7 days being the average length of time for it to remain.

We next wanted to determine whether a drain had any influence on the period of convalescence. In doing this we selected 180 uncomplicated cases in which a cholecystectomy was performed; in 100 of these drains were used and 80 were not drained. As the following graph will show those with drains remained in the hospital on the average 3½ days longer than those without drains.

The use of drainage shows a decline in the last five years, but because of the small series we did not deem it wise to tabulate the year incidence.

Days	Per Cent	
	With Drain	Less Drain
6	1	1.25
8	1	1.25
9	1	2.50
10	5	6.25
11	9	5
12	5	8.75
13	12	8.75
14	11	15
15	10	17.50
16	9	7.50
17	5	7.50
18	5	2.50
19	7	6.25
20	4	2.50
21	4	5
22	1	
23	2	
24	2	
25	4	
26	1	
Average Days	15.67	12.3

The accompanying graph shows vividly how those cases in which drainage was instituted lagged behind the others in convalescing. After twenty-one days post-operative stay in the hospital, when all the cases not drained had been discharged, ten with drainage remained. It should also be kept in mind that a number of the cases with drainage were discharged "wound still draining," whereas in all the others a dry wound had been obtained.



The following complications were encountered:

1. Wound Infection	(4.7 Per Cent)	37
2. Opening of Wound		7
3. Bronchitis		7
4. Pleurisy		4
5. Parotitis		4
6. Myocardial Disease		3
7. Pancreatitis		2
8. Influenza		2
9. Edema of Common Duct with Jaundice		1
10. Atelectic Pneumonia		1
11. Acute Bronchitis, Acute Pheblitis		1
12. Axillary Abscess from Hypodermoclysis		1
13. Cerebral Thrombosis		1
14. Neuritis		1
15. Biliary Fistula		1
16. Swelling of Left Leg		1
17. Perforation of Duodenum with Fecal Fistula		1
18. Persistent Nausea and Vomiting		1
19. Oschio-rectal Abscess		1
20. Pulmonary Embolism		1
21. Abscess of Right Shoulder		1
22. Hemorrhage from Wound		1
23. Post Operative Hemorrhage from Capsule in Gall B.		1
24. Pneumonia		1

There was no difference in the incidence of wound infection between drained and not drained cases.

Out of the entire series there were 47 fatalities; 16 had an autopsy examination. The fatalities can be grouped as follows:

Clinical Diagnosis	No. of Cases	Deaths	Mortality Rate
Chronic Cholecystitis and Chronic Cholelithiasis	570	24	4.21
Common Duct Obstruction	18	4	22.2
Acute Cholecystitis	16	4	25
Ruptured Gall Bladder	13	4	30.8
Gangrene of Gall Bladder	5	2	40
Carcinoma of the Gall Bladder	4	4	100
Carcinoma of the Pancreas	3	2	66.6
Chronic Cholecystitis and Acute Pancreatitis	2	2	100
Chronic Cholecystitis with Cholangitis	1	1	100

The causes of death determined clinically or at post mortem are as follows:

Pneumonia	8
No Anatomical Cause of Death	5
Pancreatitis	4
Carcinoma of Gall Bladder	4
Peritonitis	4
Myocardial Failure	3
Shock	3
Subdiaphragmatic Abscess	2
Carcinoma of Pancreas	2
Paralytic Ileus	1

(Continued on Page 695)

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### TAKE SPASM OUT OF PATRIOTISM

Well, here we are. The election is over and the results have been published—and are we glad it is over? But now that it *is*, what are we going to do about it?

Perhaps some will relax and forget. Others may recall a suggestion we made in an editorial entitled "Prophylactic Politics," September 15th, that "every person should methodically keep on hand a revised and up-to-date reference book of all public officials whose duty it may be to serve him in any capacity."

This is an idea we would not only reiterate but also emphasize, because any one who has not done so already should be reminded that this is the best time to begin.

The defeated parties and candidates, as such, are *passé* for the time being, and we should cultivate the acquaintance and learn more about the policies of those who have been elected to office. It is a patriotic duty to do this and to cooperate with them as much as possible, as only in this manner can the best functions of government be served.

The great trouble is that most of us think we have a duty to perform only on election day. That is spasmodic patriotism. If our boasted of-and-by-the-people government is to succeed to the fullest, every self-governing citizen of this land must take an interest in its daily affairs. The patriotism that manifests itself in denunciations and spends itself in shouting is more dangerous than the dangers it decries.

If every medical man would exert his rights of citizenship and perform his *daily* patriotic duty

many of our present problems could be quickly solved. This country has need of more constructive patriots; let's enlist now and help to set the world aright.

A. E. H.

### THE COMMON COLD

Were the economic losses from the common cold generally known, these infections would advance from trivial to the rank of serious diseases. A number of micro-organisms are thought to be responsible for upper respiratory infections, such as the pneumococci, streptococci, staphylococci and Pfeiffer's bacilli. A filterable virus has also been found to be present in the nasal secretions of common colds which reproduces the disease when applied to the nasal mucous membranes of healthy persons. Some evidence is accruing to lead one to believe that at least some of the common colds are due to allergy. Excellent evidence is available to show that atmospheric conditions have much to do with the development of epidemics of colds. During the summer months a heat wave, followed by a few chilly nights or days, will almost invariably result in an epidemic of common colds. During the winter months a cold wave lasting a few days is nearly always followed by an epidemic of colds. Changes in atmospheric conditions during the fall and spring months also results in large numbers of colds. Actual observations made on the nasal membranes of human beings under different atmospheric conditions have proved that cold air promotes the development of colds.

There can be little doubt that the fresh air faddists have had much to do with the high incidence of that very insidious disease, the common cold. Without having any fundamental training in disease prevention, they have broadcast to the public repeatedly their fresh air doctrines. To advocate the use of open windows

in all climates, at all seasons of the year, is to jeopardize the health of the public. The human body functions best, both in health and disease, when the temperature of the air is approximately 68 degrees, the relative humidity between 40 and 50 per cent, the air rendered free from contamination through filtration, and circulated slowly. There is no spot on the surface of the earth where these conditions obtain for more than brief periods of time each year.

The great hope of the future lies in the present movement for conditioned air, which is rapidly gaining momentum. To thinking people it is most logical; in actual practice it is most effective. It is being supported and promoted by the ventilating engineers of America and by observing physicians. It is just as essential as the conditioning of water and milk in the prevention of typhoid fever, septic sore throat, etc., in that it prevents large numbers of respiratory diseases. While it is true that air conditioning devices which bring about the ideal are still rather expensive and as yet can not be provided for every home and building where people live and work, yet this fact does not compel us to send forth untruthful statements concerning air. When the necessity for conditioned air is realized by the public and sufficient demand is made for air conditioning devices, the ventilating engineers and the manufacturers will have satisfactory devices which, produced in large volume, can be brought within the financial reach of most people. One may safely predict that when this time arrives, the common cold will no longer be a major health problem.

In the prevention of any disease, the important factor is removal of the cause. We are unable to remove the pathogenic micro-organisms which so commonly inhabit the nose and throat, but we can remove in large part the atmospheric conditions which promote their proliferation. Even the casual observer recognizes that the common cold is transmitted from person to person; therefore, an excellent preventive measure is to isolate the patient who is developing a cold until it has subsided. Even in our hospitals, great harm has been done by failure to practice isolation through medical asepsis. This procedure would be more than worth while if it were only for the prevention of common colds. Not infrequently debilitated patients occupying hospital beds have common colds carried to them by visitors. Such patients do not tolerate colds well and not infrequently the cold terminates in fatal pneumonia. The Ancker Hospital in the city of St. Paul

has taken a long step forward in the prevention of the acute upper respiratory infections, as well as other communicable diseases, through the practice of medical asepsis.

Once a cold has developed, how shall it be treated? Many drugs have been used locally and internally; a few have a palliative effect but not one has any specificity. A few years ago the inhalation of air with a very small chlorine content became popular, but observation of patients so treated proved quite definitely that it, like most other forms of treatment, belong in the discard. Autogenous and stock vaccines have been used quite extensively. While a few workers are somewhat enthusiastic about them, the concensus of opinion is that they are not of general value. Alpine light has been strongly advocated by a few but while it may have a slight tonic effect, it is in no way specific. The most ideal treatment of the common cold known today consists of isolating the patient as far as possible; rest, preferably in bed; palliative drugs as necessary; forced fluids; wholesome diet; good elimination, and, most important of all, the proper atmospheric conditions: namely, temperature 68 degrees; humidity 40 to 50 per cent; clean and slowly circulating air. Whether these conditions are found outdoors or in makes no difference. If they are brought about artificially inside, as is most often necessary, to open the windows for the sake of fresh air in which none of these conditions obtain, not only aggravates and prolongs the duration of illness but increases the chance of the development of pneumonia.

J. A. M.

#### PHYSICIANS AND PHARMACISTS

We wish to voice our most heartfelt commendation of the efforts made by the Interprofessional Relations Committee, the Minnesota State Pharmaceutical Association and the Northwest Pharmaceutical Bureau to bring the professions of medicine and pharmacy more closely together.

The members of the committee have acted in the capacity of *liaison* officers, whose functions have been to arrange joint meetings to promote a better understanding of the problems of each. Cards have been distributed at such meetings and through the mail to members of the medical profession, giving the formulae of many useful preparations from the U. S. Pharmacopoea and National Formulary; and some have cited the comparative costs under proprietary names and when manufactured by the local pharmacist, which is all very well and something we should have knowledge of.

The inference that we fear, however, is that we will consent to substitution when proprietaries are actually specified. It is but a logical next step, and one that we must resist. Meritorious recognition must be accorded pharmacists whether they put up four-ounce mixtures or manufacture on a larger scale.

A. E. H.

A REVIEW OF GALL BLADDER SURGERY

(Continued from Page 692)

Pulmonary Edema .....	1
Pulmonary Embolism .....	1
Cholemia .....	1
Abscess of Parotid .....	1
Died on Table Cardiac and Respiratory Failure.....	1
Capillary Hemorrhage .....	2
Acute Dilatation of Stomach .....	2
Intestinal Hemorrhage .....	2

No difference was observed in the mortality rate between those cases drained and those not drained.

SUMMARY

1. Over a period of 10 years at St. Mary's Hospital 656 cases of diseases of the gall bladder came to operation. Of these 78.5 percent were female and 21.5 percent were male.

2. 171 cases or 26 per cent had X-Ray studies before operation.

3. Local was the largest single form of anaesthetic used, the closed method of general anaesthetic coming second.

4. The average stay in the hospital for uncomplicated cases was 14 days. The records also show that there is a tendency for those cases in which drains were used to remain in the hospital longer than those not drained.

5. 83 per cent were treated by cholecystectomy and 12 per cent by cholecystotomy.

6. Of 80 cases treated by cholecystotomy, 18, or 22.5 per cent, returned to the hospital for repeated gall-bladder surgery.

ROBERT F. CAMPBELL, M.D.

Robert Franklin Campbell, M.D., died October 28, 1932, suddenly, of heart disease at his residence in Watertown, S. D.

Born at Aylmer, Ontario, Canada, March 23, 1857, son of Mr. and Mrs. William Campbell, three brothers, Francis, Charles and Alexander preceded him in death.

Medical training at McGill University Medical School, graduating from Bellevue College and Hospital of New York City, Class of 1882. Located at Watertown, Dakota Territory in May

1882 for the practice of his chosen profession, medicine and surgery.

In 1884, he married Miss Kate Williams, daughter of Mr. and Mrs. C. G. Williams of Watertown, who died in 1922. On August 6, 1925, Dr. Campbell married Miss Ethel Pritchard, daughter of Mr. and Mrs. Thomas Pritchard, who survives, no children.

Dr. Campbell as a pioneer made a wide acquaintance, and was actively engaged in practice until his sudden death. He was the first County Physician, of Codington County, in 1882. In 1904, Dr. Campbell associated with Dr. H. M. Finnerud and Dr. H. A. Tarbell in establishing and conducting the first hospital operated in Watertown. Dr. Campbell did post graduate work at London, Vienna, and Berlin.

Served as district physician for the Chicago & Northwestern R. R., also surgeon for Chicago, Northwestern, Minneapolis & St. Louis and Great Northern. He was the second president of the C. & N. W. railway surgeons association, which he attended annually.

Staff member of Luther Hospital, Watertown, American Medical Association, South Dakota State Medical Association, and his local District Medical Society. He was active in the progress of organized medicine for South Dakota. Member of Episcopal Church, Elks Lodge, Rotarian and active interest in charities. Funeral services from Trinity Episcopal Church were conducted by Rev. Valentine Jenkins. Interment at Mount Hope Cemetery.

J. F. D. C.

FRANK MILLER, M.D.

Frank Miller, M.D., of Aberdeen, S. D., died at his home, November 1, 1932 of a cerebral hemorrhage.

Born at Newark, Ohio, May 8, 1867. Widower, and no children. One sister, Mrs. R. H. Ralston of Newark, Ohio, survives.

Graduated from Starling Medical College, Columbia, Ohio, Class 1893. Began practice of medicine, at Verdon, S. D., in 1893. Did post-graduate work at Philadelphia and Chicago, then located in Aberdeen, in 1896 where he confined his practice to his chosen specialty, eye, ear, nose and throat.

Funeral services were held from Presbyterian Church, Friday, November 4, at 2:00 P. M. Masonic Lodge in charge. Interment, Aberdeen Cemetery.

J. F. D. C.

## NEWS ITEMS

We extend a most cordial invitation to the secretaries of the different District Societies to send us the reports of their monthly meetings as well as any news items that will be of interest to the profession.

Dr. Walter Kaufman has recently opened offices for general practice at Glencoe, Minn.

Dr. E. G. McKeown has been named as health officer at Pipestone, Minn., for the coming year.

Dr. R. S. Westaby, Madison, S. D., was a recent visitor at Chicago and St. Louis, making the trip by plane.

Dr. Carl Voss, Hettinger, N. D., is spending the winter months in Europe, where he will take a course in post graduate work.

Dr. John J. Ederer, who has been in practice at Bellingham, Minn., has moved to Morris and is now associated with D. C. E. Cain.

Dr. W. O. Tessier, who has been in active practice during the past ten years at Oklee, Minn., died last month, after a short illness.

Dr. J. J. Seibel, Harvey, N. D., has left for an extended trip to California, where he will take some post graduate work at San Francisco.

Dr. Wm. J. Mayo, Rochester, was elected president of the Post Graduate Medical Association, at the annual meeting held at Indianapolis last month.

Dr. F. C. Coslett has been appointed superintendent of the South Dakota State Sanatorium. Dr. Coslett takes the place of the late Dr. R. E. Woodworth.

Dr. Fannie Dunn Quain was elected president of the Burleigh County Pioneers association at the annual banquet and meeting held at Bismarck, N. D., last month.

At the annual meeting of the Park Region Medical Society held at Fergus Falls, Minn., Dr. W. S. Broker, Battle Lake, was elected president for the coming year.

Dr. W. G. Rogne, a graduate of the University of Minnesota, who has been located at McClusky, N. D., has moved to Wheaton, Minn., and will continue in general practice.

Dr. Frank Miller, one of the pioneer physicians of Aberdeen, died this month after a short illness. Dr. Miller was well known by the medical men all over the Northwest.

Dr. Morris Fishbein, editor of the American Medical Journal, was in the Twin Cities last month as a guest speaker at the annual meeting of the Minnesota Educational Association.

Dr. William D. Haggard, professor of clinical surgery at Vanderbilt University, Nashville, Tenn., was named president of the American College of Surgeons at the St. Louis congress.

Dr. R. C. Webb, Minneapolis addressed the members of the East Central Minnesota Medical Society on "Drainage in Appendicitis" at a meeting recently held at Cambridge, Minn.

A joint meeting of the Sioux Falls Medical Society and the Dental Association was held last month, with Dr. W. L. Shearer, Omaha, as the guest speaker, his topic being "Surgery of the Jaws."

Dr. M. C. Jorgenson has joined the staff of the Watertown, S. D., Clinic and will specialize in obstetrics and diseases of children. Dr. Jorgenson is a graduate of the Northwestern Medical School.

Mrs. Mildred Isakson, superintendent of nurses at the state sanatorium at San Haven, was re-elected president of the North Dakota Nurses Association at the state convention held recently at Grand Forks.

The eightieth annual meeting of the Minnesota State Medical Association will be held at Rochester, Minn., May 22, 23 and 24, 1933. Many distinguished world authorities on medicine and surgery will be on the program.

At the October meeting of the Lyons-Lincoln County Medical Society held at Marshall, Minn., four guest speakers were present from Minneapolis, which included Drs. J. A. Johnson, W. H. Condit, S. Marx White and G. J. Thomas.

The Lyons-Lincoln Medical Society, at a recent meeting at Marshall, Minn., elected the following officers: Dr. A. O. Olson, Hendricks, president; Dr. L. H. Happe, Marshall, vice-president, and Dr. H. M. Workman, Tracy, secretary.

Minneapolis is one of the five cities in the population range of 250,000 to 500,000 to receive honorable mention in the 1931 health conservation contest sponsored by the Chamber of Commerce of the United States and the American Public Health Association.

Dr. W. H. Valentine of Tracy was named president of the Minnesota State Sanitary Conference at its annual business session in St.

Paul. Other officers are Dr. L. M. Roberts, Little Falls, vice-president, and Dr. A. J. Chesley, of the state board of health, secretary and treasurer.

The body of Dr. Rudolph Horsky, aged 61 years, widely known Helena physician, was found recently in an artificial fish pond near his cabin 35 miles west of here. Marks on a bank indicated he slipped and fell into the water. Dr. Horsky was a past president of the Montana State Medical Society.

Nearly 100 U. S. medical reserve officers of the Mayo Clinic, Rochester, were guests at Fort Snelling recently, inspecting the military post and listening to discussions of medical problems. Col. J. R. McKnight, post surgeon, discussed "Mess Management, Funds and Supplies," in an address at the post hospital.

At the October meeting of the twelfth district medical society held at Milbank, S. D., Dr. H. L. Smith, Rochester, Minn., was the guest speaker, his topic being "Recent Methods of Treatment in Heart Failure." Drs. J. R. Westaby, Madison; A. G. Pohlman, Vermilion, and J. C. Ohlmacher, Vermilion, were present and added interesting talks.

Wadena County Medical Society held a one-day study of tuberculosis at Wadena, Minn., on November 10th. Among the prominent speakers were Dr. J. A. Myers, Minneapolis, president of the Minnesota Public Health Association; Dr. C. A. Stewart, Minneapolis; Dr. Walter H. Ude, Minneapolis, and Dr. E. A. Meyerding, St. Paul, executive secretary of the Association.

Mr. William Mills, who has been the active head of the Swedish Hospital, Minneapolis, for the past ten years, has resigned and will enter other lines of business. During the time that Mr. Mills has been superintendent, the hospital has grown from 200 bed capacity to 350 beds. The growth included construction of a new hospital building which was completed three years ago.

The return of the former trusted position of the family doctor is regarded by Minnesota State Medical Association representatives as one of the few bright aspects of the economic depression. If the current hard times yield nothing more on the credit side of the public ledger than the re-intrenchment in public trust and esteem of the family physician it will have had its good use.

A cancer control program for South Dakota was discussed by Dr. John M. Flude of Holly-

wood, Calif., at a meeting of the South Dakota state board of health and the State Medical society. At the conference were Dr. A. E. Bostrom, Waubay, of the state board of health, and Dr. J. R. Westaby, Madison, president, and Dr. F. J. D. Cook, Langford, secretary of the state society.

The will of the late Colonel Cushman A. Rice, famed soldier of fortune, and veteran of three wars, bequeaths his home in Willmar, Minn., and other property to the city for the purpose of establishing a modern hospital and nurses' home. The hospital is to be known as the "Rice Memorial Hospital." Col. Rice also established a fund in his will to provide medical care for the needy. If the city of Willmar does not accept the bequest the income from the estate will go to the Mayo Clinic at Rochester.

For their services to science and humanity, Dr. W. J. Mayo and Dr. Chas. H. Mayo, world famous surgeons, were given the title of *Comandatore della Corona d'Italia* (knight commander of the crown of Italy). The decorations were conferred by C. A. Castigliano, acting royal Italian consul of St. Paul, appearing in behalf of the king of Italy and the Italian government, at a ceremony in the presence of a large group of Rochester citizens, representatives of civic organizations and city officials.

The Minnesota Radiological Society held its twelfth meeting at St. Luke's Hospital, Duluth. The following program was presented: "Roentgen Findings in Pneumoconiosis" by Dr. J. R. McNutt, Duluth. "Roentgen Therapy in Carcinoma of the Uterine Corpus" by Dr. F. B. Exner, Minneapolis. "Roentgen Visualization of the Urethra, Normal and Pathological" by Dr. M. A. Nicholson, Duluth. "Atelectasis of the Lungs," by Dr. F. J. Hirschboeck, Duluth. "Round Table Discussion on Problems of Roentgen Diagnosis and Therapy," conducted by Dr. Gage Clement, Duluth. Address: "Diaphragmatic Hernia," (a) Roentgen Aspect, by Dr. B. R. Kirklin, Rochester; (b) Surgical Aspect, by Dr. S. W. Harrington, Rochester.

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## Pneumothorax in a Newborn Infant

WILL E. DONAHOE, M.D.

*Sioux Falls, S. D.*

A FEMALE infant was seen two days after its delivery (Feb. 13, 1932) because of difficulty in feeding and persistent vomiting, or as the nurse stated—"an inability to swallow." Physical examination at that time revealed a well developed infant weighing eight pounds and normal in every way except for certain chest findings. Respiration was free, easy and regular, but of abdominal type in a moderate degree, sufficient to give a noticeable retraction of the costal margin on the right side in inspiration. Failure of the right side of chest to participate in the respiratory excursion was plainly evident. Percussion showed no dullness, but there was a difference between the two sides—the right being more resonant than the left. Auscultation likewise showed a difference on comparing the two sides, in that the breath sounds were distant on the right side—though audible throughout. At no time was there any dyspnoea, stridor, or cyanosis. There were no rales heard and a cracked-pot sound could not be elicited by auscultator or percussion.

The patient was referred to Dr. N. J. Nessa for X-ray examination, who reported a pneumothorax on the right side. The film showed no evidence of fracture of any rib.

The delivery of this infant by Dr. Monte A. Stern had been a very difficult podalic version and breech extraction with forceps applied on the after coming head. The baby cried out lustily upon birth, required no resuscitation nor did it show any signs of respiratory embarrassment.

The baby seemed to be perfectly normal in every way, but by the end of the second day the nurse became satisfied that the baby was not swallowing as it should, and vomited, or, rather, seemed unable to swallow when water or feedings were offered. It was for this reason that I was consulted.

The baby looked well at all times; that is, it had no appearance of anxiety or distress, and did well in every way from the start. It even had to be put on a cow's milk formula because of the mother's inability to nurse. No special treatment was instituted, and "watchful waiting" after two or three days found the baby holding in weight and taking some of its feedings from bottle, whereas in the beginning the nurse teased it along with a dropper. The vomiting—so called—seemed to be more of a gagging or retching on attempts to swallow, and this lessened so that by the end of ten days the infant was taking full feedings every four hours and gaining in weight.

After two or three days an improvement in respiration was likewise suspected, and by the end of a week there was no doubt that the right side of the chest was becoming more normal. The right chest was participating a little in the respiratory excursion; less abdominal effort, less retraction of costal margin, and percussion and auscultation were not so different in the two sides. Improvement continued so that by March 3, three weeks after its birth, physical examination found respiration normal, the right and left chest were



identical, and the X-ray showed a normal expansion of the lung with no air in the pleural space.

Reference books do not index pneumothorax in the newborn, but there is an illuminating article in the July issue of the *American Journal of Diseases of Children*, in which Dr. Jacob Stein reports a case, giving a review of all the literature in all the languages then indexed in the New York Medical Libraries on "congenital pneumothorax," and finds only four cases previously reported. In three of these instances birth trauma seemed responsible, and in my case the communication between the lungs, or a bronchus, and the pleural cavity was probably produced through the stress of delivery. This, then, being a condition brought about during the act of delivery, should more properly be termed a "pneumothorax of the newborn," rather than a "congenital pneumothorax."

Pneumothorax in early life is an exceedingly rare condition. It may result from injury by foreign bodies in a bronchus, from tuberculosis, rupture of an inflammatory area, an abscess of bronchi or lung, or it may follow an empyema, pneumonia, or whooping cough. No author refers to pneumothorax occurring at birth, but a study of the few cases referred to above would indicate that it might be produced by injury to a bronchus or the lung during delivery, or rupture of bronchi or alveoli following the great effort made at inspiration, because of the blocking of the passages with amniotic fluid, or an edema

of the larynx or collapse of the epiglottis. One author reports an aplasia of the lung tissue or a pleuraless thoracic cavity, which would, of course, constitute a congenital condition.

The symptoms would be those referable to interference with respiration; immobile chest, abdominal type of inspiration with corresponding retraction of costal margins, tympany or hyperresonance, and an absence of, or weak, breath sounds. The supposedly cracked-pot sound has not been noted in any of the reported cases. Asphyxia at the time of birth, requiring resuscitation to a greater or less degree, was present in four of the six cases. Dyspnoea occurred in three cases, and cyanosis (on exertion) in three cases. Vomiting seemed to be a concerning symptom from the beginning in four of the cases. It would seem to be reflex, or occasioned by involvement along the esophagus because of the same injury that produced the pneumothorax.

The diagnosis is practically dependent upon the X-ray, which, of course, should be resorted to in any abnormalcy of respiration or chest findings.

The prognosis should be guarded—and like the symptoms and treatment, dependent upon the underlying cause and the extent of complica-



tions. Of the known cases, two died of the pneumothorax, and one of a complicating bronchopneumonia. Two were living at the time of the report; one was three months of age, and the other two years, and showed a permanent pneumothorax. My case is living—the air in the pleural space having absorbed and the lung is functioning normal at the end of three weeks.

The treatment would be expectant and symptomatic, special attention being given to the feeding and the up-building of the child's general condition and resistance.

Male infant born in McKennan Hospital, September 6, 1932. Para III. Normal labor and spontaneous delivery at eight months. Required considerable resuscitation to start breathing, also at repeated intervals for twenty-four hours, during which time remained quite blue. Color afterwards improved but on the third day, because of the general hardness and immobility of the baby's musculature, I was consulted.

It had a firm, stone-like feel with tight, immovable skin everywhere except abdomen and scrotum. Arms were flexed against the body and thighs on abdomen. Joints unbendable and had been since birth. Of this I made a provisional diagnosis of sclerema neonatorum and, because of the history of difficulty in establishing respiration, gave a subcutaneous injection of mother's blood. Spinal puncture was refused. At this time respiration was free and easy, physical examination of chest showing normal.

On the fifth day while nursing, the baby had a sudden severe choking spell, becoming alarmingly cyanotic and dyspnoeic. After about ten minutes the choking ceased and color cleared, but the dyspnoea accompanied by marked retraction of the costal margin continued, as well as twitching of the face, arms, and legs, which in a short time developed into a hard general convulsion lasting five minutes. X-Ray plate showed no thymic enlargement but the baby was nevertheless given a therapeutic dose. The plate did, however, show a pneumothorax, collapsing fully one-half of the right lung.

Convulsive twitching of body stopped but the eyes continued an intermittent downward jerk and the baby remained in a state of collapse. Labored noisy respiration continued outstanding, breathing with the greatest effort and marked retraction of the costal margin which formed a groove sharp and deep enough to bury a lead pencil. Satisfactory examination of the chest was impossible because of the movement and noise of breathing. Death followed four and one-half hours after the choking spell. Post mortem was not permitted.

Cause of death was undoubtedly pneumothorax (spontaneous and in connection with the choking spell, as I feel certain that condition did not previously exist). Contributing causes convulsion, probable sclerema neonatorum, and probable cerebral hemorrhage.

## Eclampsia: The Responsibility of the General Practitioner in Its Prevention\*

E. M. RANSOM, M.D.

*Minot, N. D.*

**I**N HIS presidential address read at the Forty-fourth Annual Meeting of the American Association of Obstetricians, Gynecologists and abdominal Surgeons, in September, 1931, Arthur H. Bill<sup>1</sup> made this statement: "Eclampsia still remains the most important proplem in Obstetrics."

D'Acerno<sup>2</sup>, quoting Williams, states that of 25,000 women dying annually during the last decade in the United States, 3,000 died from eclampsia and that fetal mortality averaged 30 per cent.

\*Read at the Annual Session of the North Dakota State Medical Association, Grand Forks, June 1, 1932.

Miller and Martinez<sup>3</sup> estimated a total of 4,878 women dying of eclampsia in the year 1927; and government reports, covering 28 states in the registration area, show a mortality of 15 per 10,000 live births from albuminuria and convulsions in 1929. It is apparent that with adequate prenatal care a large percentage of these deaths could be prevented and it is equally apparent that the lack of such care is due either to failure of the pregnant woman to appreciate the necessity of it or failure of the attending physician to provide her with it.

Noticeable among case reports are such descriptions as these: "Case 98.—A severe neglected

case; the patient had 20 convulsions before admission."

"Case 75.—A postpartum case. The patient was moribund on admission and died within four hours."<sup>4</sup>

Acosta-Sison<sup>5</sup> in a clinicopathologic study of eclampsia based upon 38 autopsied cases, noted that "none of the patients had prenatal care and 33 of them were admitted unconscious, and with a history of one or more convulsions at home."

No statistics are available to show how many neglected cases have never seen a physician; have seen one too infrequently; or, on the other hand, have visited a physician regularly and been neglected by him.

As general practitioners, we cannot escape the responsibility which rests upon us to reduce the annual number of deaths from eclampsia. As a first step in this we should constantly urge upon our patients the necessity of routine prenatal care, and give to every patient thorough and repeated examinations.

The purpose of this paper is to classify in a practical way the late toxemias of pregnancy and to describe a diagnosis and treatment of preeclampsia which can be followed by any general practitioner.

Many authorities have attempted to classify the late pregnancy toxemias. Stander, Peckham and Plass, after exhaustive studies of the blood chemistry in their cases at Johns Hopkins, proposed a division into eclampsia, preeclampsia, chronic nephritis, eclampsia superimposed on chronic nephritis and low reserve kidney. The last is described by Williams<sup>6</sup> as due to a lessening of functioning glomeruli, either congenital or acquired; its function quickly returns to normal following delivery, and the condition does not lead to chronic nephritis. DeLee<sup>7</sup> believes it to be a larval form of chronic nephritis.

J. O. Polak<sup>8</sup> states that from a diagnostic standpoint preeclamptic toxemia and eclampsia may be classed as hepatic and renal types; and DeLee<sup>9</sup> lists four diseases as underlying the symptoms of eclampsia and preeclampsia.

Since it is often impossible in the *anti partum* stage to differentiate the types of the symptom-complex known as eclampsia, it seems best to include as preeclampsia all cases presenting typical symptoms of toxemia in late pregnancy which do not reach the convulsive stage; and more especially does this classification suffice since the present accepted treatment of the condition is practically the same regardless of the underlying cause. This is in accord with Lazard's<sup>10</sup> last report in

which, under the term preeclamptic toxemias, he includes all cases of toxemias of pregnancy "treated with a view of preventing convulsions whether of the so-called true or hepatic type, the nephritic type or a combination of the two."

Many theories have been advanced concerning the cause of eclampsia. None of them have thus far been proven specific and they are of interest to the general practitioner largely because treatments most commonly employed today are the direct result of these theories.

It has long been held that the products of conception, the fetus and placenta, are responsible for the toxin causing eclampsia. Those<sup>11</sup> who support this contention believe in radical procedures to empty the uterus.

Focal infection<sup>12</sup>, improper diet,<sup>13, 14</sup> disturbed protein metabolism plus faulty elimination by bowel and kidneys,<sup>15, 16, 17</sup> disturbance of carbohydrate metabolism,<sup>18, 19</sup> and calcium deficiency<sup>20, 21</sup> are proposed by some and rejected by others as etiologic factors in eclampsia.

We should consider as preeclampsia all cases which present one or more of the following symptoms: (1) A gradual or sudden persistent elevation of systolic blood pressure above 140 m.m.; (2) a persistent, and especially an increasing, albuminuria where none has existed in the earlier months of pregnancy; (3) edema involving especially the eyelids and face or becoming generalized; (4) repeated headaches of the frontal type which come on suddenly, particularly if accompanied by blurred vision; and in addition to these, (5) eye-ground and blood chemistry pathology if we are in a position to have the necessary examinations made.

Treatment of preeclampsia concerns itself first with the milder cases, for which correction of focal infection; restriction of proteins and salt if edema is present; and stimulation of elimination, by forcing fluids and rest in bed, often suffice to cure the condition.

If in spite of this treatment, the preeclampsia becomes progressively worse, a choice must be made between conservative treatment and emptying the uterus. During the last few years conservative treatment has largely replaced radical treatment, especially cesarean section. Kosmak,<sup>22</sup> writing on the responsibility of the medical profession in the mortality of childbearing, reviews the studies made by Adair, Mussey, and Holmes and those of E. D. Plass as reported to the recent White House Conference, and also calls attention to an analysis being made of deaths in New York City, where over 120,000 births occur an-

nally. He concludes that "forceps, version and cesarean section constitute a trinity which must be viewed with trepidation and alarm," and further states that "judging from the results obtained in New York City, cesarean section is evidently neither safe nor simple and should be reserved for those who will honestly weigh the indications demanding this major procedure before attempting the same."

Eclampsia or a severe case of preeclampsia is a concededly poor surgical risk. Lazard<sup>23</sup> quotes Miller as stating, in a study of cesarean sections in eclampsia, that mortalities ranged from 24 per cent to 66 per cent. Lazard<sup>24</sup> reserves cesarean section for "those cases where obstetric conditions are such as to indicate its performance irrespective of the toxemia."

Conservative treatment of eclampsia and preeclampsia is receiving more recognition and being more widely practiced from year to year. The Stroganoff method of narcosis has been largely supplanted in the last half a dozen years by the magnesium sulphate treatment as employed by McNeile<sup>25</sup>, Lazard<sup>26</sup>, Irwin<sup>26</sup>, Vruwink<sup>26</sup>, and others. I have used it in my practice for the past five years.

This treatment causes an increased diuresis, a reduction in blood pressure and a rapid elimination of edema, with consequent reduction in intracranial pressure, which according to Zangmeister<sup>27</sup>, is the cause of the convulsions. The drug is easily administered intravenously by means of a 20 cc. Luer syringe, using Lilly's 20 cc. ampoule of a 10 per cent solution. Almost immediately on the introduction of the first few cc. of the solution, the patient complains of feeling very warm, especially in her face and over the upper portion of her body; and in most of my cases, there has been slight respiratory embarrassment causing the patient to ask for open windows.

This reaction can be largely prevented by warming the solution and injecting it very slowly. None of my cases have shown cyanosis, and I am convinced that the reaction, which is very transient, should deter no one from using the treatment. In fact, the deep inhalations of fresh air which the patient demands must be beneficial, according to DeLee<sup>28</sup> and to Stander<sup>29</sup>, who claim that eclamptic or severe preeclamptic patients get rid of large amounts of impurities and overcome acidosis, which is often present, by deep breathing of fresh air. It is rarely necessary to exceed three 20 cc. ampoules of 10 per cent solution of magnesium sulphate in 24 hours. This has been established by Stander<sup>30</sup> as a safe

dosage, although it has often been exceeded with apparent impunity by Lazard<sup>31</sup> and his co-workers.

In addition to the use of magnesium sulphate intravenously, its use by mouth is indicated; and diuresis should be further encouraged by drinking large amounts of fluid. Edema, unless extreme, is no contra-indication to fluids and not even then if the 24-hour output approximates the intake.

Until recently I have not used intravenous glucose in eclampsia or preeclampsia, but its use seems indicated in view of the peripheral necrosis of the liver lobule, which is the most constant pathological finding in eclampsia. Even Stander<sup>32</sup>, while opposing the contention of Titus<sup>33, 34</sup> that hypoglycemia exists in eclampsia, advises the use of intravenous glucose as a protection against liver damage and for the promotion of diuresis.

It is in accord with present methods of practice to place the preeclamptic on a low protein and low salt diet. The following has been used for my patients:

#### LOW PROTEIN - LOW SALT DIET

(20 Grams Protein)

Do not keep patient on this diet more than ten days.

Foods Allowed:

FRUITS—Fresh or canned, four servings.

VEGETABLES—Potato, one serving; green vegetables, two large servings.

MILK—One-half glass daily.

CREAM—One-half glass daily.

BREAD—Three slices daily.

CEREAL—One serving daily.

BUTTER—As desired.

SOUPS—Cream soups from milk allowance or vegetable soups,

using vegetables and vegetable juices. NO MEAT

BROTHS OR MEAT JUICES. Use from allowance of

vegetables and fruits and season with a MILD dressing.

DESSERTS—Use from fruit allowance or make a milk

dessert from milk allowance.

BEVERAGE—Postum, Kaffee Hag, Sanka, weak tea or fruit

juices.

RESTRICT—Meats, meat broths and meat gravies.

Highly seasoned foods.

Pepper and other condiments.

Rich foods, as pastries.

Salt.

Increase diet gradually after 7th-10th day.

30 Grams Protein

20 grams Protein plus

1 glass milk or 1 egg

1 slice bread 1 slice bread

40 Grams Protein

30 grams Protein plus

1½ glasses milk or 1 glass milk

1 serving custard

50 Grams Protein

40 grams Protein plus

1 glass milk

½ cup cream soup

60 Grams Protein

50 grams Protein plus

1 glass milk

½ cup cream soup

60 Gram Protein diet

20 grams Protein plus

4¾ glasses milk or 3 glasses milk

1 cup cream soup 1 egg

1 slice bread 1 cup cream soup

1 serving custard

1 small serving chicken may be substituted for 1 egg.

1 small lamb chop may be substituted for 1 egg.

1 small cube American Cheese may be substituted for 1 egg.

If in spite of conservative treatment it becomes necessary to empty the uterus, the method chosen should be that which will inflict the least injury

and result in the least shock to the patient. A general anaesthesia should be avoided if possible and chloroform, the most dangerous of anaesthetics in eclampsia, should not be used. Sodium amytal, Nembutal and local anaesthetics may suffice.

All cases of preeclampsia and eclampsia should have follow-up examinations for several weeks or longer.

In the preparation of this paper I reviewed 1,000 cases of late pregnancies occurring in my practice since January 1st, 1928. Among these were 49 cases of preeclampsia, grouped as follows:

Nineteen had edema, albumin and high blood pressure.

Twelve had edema, albumin, headaches and high blood pressure.

Six had high blood pressure, albumin and no edema.

Four had 3+ albumin, edema and no blood pressure reading above 132/70. One of these complained of numbness of entire right side of body during this pregnancy, which was her first; and during her second pregnancy, developed at the fifth month a paralytic stroke involving the right side of the face and left side of body, although there was during this second pregnancy no albumin nor edema, and no increase in blood pressure above 130/76. Wassermann and Kahn were negative.

Three had high blood pressure only.

Two had high blood pressure, edema and no albumin.

Two had edema, albumin, blurring of vision and no increase in blood pressure over normal. One of these had been confined 4 years previously and at that time had eclampsia.

One had high blood pressure, albumin and blurring of vision. Twenty-nine of these cases responded to restricted diet and elimination. Twenty, in addition to restriction of diet, and rest in bed, were treated with magnesium sulphate.

The following reports illustrate the treatment in two severe cases.

#### First Case

Mrs. S., age 30, gravida 1, 6½ months gestation, was seen first on day of admission to hospital December 26th, 1931, with a blood pressure of 170/90, marked generalized edema, headaches, albumin a trace, hyalin and coarsely granular casts. She was placed upon a 20 per cent protein and low salt diet, given Dram I magnesium sulphate, saturated solution, every hour for an average of 15 doses per 24 hours. She received

a total of 8-20 cc. ampoules of 10 per cent solution magnesium sulphate intravenously. Remained in the hospital 8 days. Was discharged January 2, 1932, with a blood pressure of 134/90, slight edema of lower extremities and urine negative. Her blood pressure was taken at frequent intervals during January, showing no increase and on January 26th blood pressure was 136/90. On this date, however, urine showed albumin 2+, edema of feet and legs increasing. On February 3rd she again entered the hospital with a blood pressure of 160/100. At 10 o'clock P.M. on day of second admission she was seized with a sudden severe pain in the lower left abdominal quadrant, accompanied by a distinct tumor formation. F. H. T. 134 on admission dropped to 110. By 11 o'clock P.M. patient was in labor. Diagnosis of *abruptio placentae* was made, but as tumor was not increasing in size, vaginal bleeding was not excessive and patient's pulse remained good, it was decided to allow labor to continue normally. F. H. T., however, were imperceptible at 2:15 A.M. Patient was delivered of a stillborn female infant at 4:40 A.M. on February 4, 1932. She was kept on a restricted protein and low salt diet and was discharged on February 14th, with a blood pressure of 132/78 and urine negative.

#### Second Case

Mrs. H., aged 39, gravida 6, gestation 7 months, was seen first on December 5, 1931, at which time her blood pressure was 112/60, urine was negative. Was not seen again until March 31, 1932, at which time her blood pressure was 164/102, urine contained albumin 4+ and a large number of hyalin and coarsely and finely granular casts, extreme generalized edema and headaches. She entered the hospital on this date.

On April 4th her vision was distinctly blurred and eye grounds showed retinal edema. She was advised to have labor induced, but this she steadfastly refused. She was placed on a 20 per cent protein, low salt diet, given saturated solution magnesium sulphate, Dram I, by mouth every hour; and from 1 to 2, 20 cc. ampoules of 10 per cent solution magnesium sulphate intravenously each 24 hours, until date of delivery. She also received occasionally after April 18th, 500 cc. of 10 per cent glucose intravenously. Blood pressure remained practically the same as on admission, being 162/120 at time of delivery. Edema was greatly reduced in spite of a daily intake, averaging above 4,000 cc. per 24 hours.

On April 26th she went into a spontaneous labor and was delivered of a living male infant. She was dismissed from the hospital May 22nd,

at which time her blood pressure was 118/88, her urine showed a trace of albumin and no edema was present. Vision was still blurred but improving.

It has been my practice to follow the conservative method of treatment even in severe cases. Although the number of cases here reported is small, I have not had a treated patient develop convulsions, since beginning the use of magnesium sulphate. Perhaps the discontinuance of hot packs, now considered inefficient and dangerous because they fail to eliminate toxin and raise intracranial pressure, may have contributed to this result; but it seems reasonable to me to believe that magnesium sulphate added to diet, rest in bed and elimination may have prevented convulsions, since the same treatment minus magnesium sulphate did not prevent this complication in my practice previous to its use.

Larson<sup>35</sup> discussing the etiology of the toxemias of pregnancy states "it is quite likely that the favorable action of magnesium sulphate may have a deeper significance than is thus far understood" and ventures the prediction that "a further investigation of the calcium, phosphorus, and magnesium metabolism with their possible inter-relationship and interdependence, may clear up at least in part, the etiology of the toxemias of pregnancy and may provide a means of preventing and treating the condition."

#### CONCLUSIONS

1. Physicians should urge upon women the necessity of more frequent examinations during pregnancy, and should make these examinations more thorough.

2. For practical purposes the late toxemias of pregnancy may be grouped as preeclamptic (without convulsions) and eclamptic (with convulsions).

3. Theories of etiology and symptoms of eclampsia are important to the general practitioner because they form the basis for treatment.

4. Conservative treatment as exemplified in restricted diet, elimination, intravenous glucose, and magnesium sulphate should be the method of choice in the management of preeclampsia and eclampsia.

#### DISCUSSION

DR. JOHN H. MOORE (Grand Forks): It is very refreshing to hear a man give a paper on eclampsia and stick to the simple classification of preeclampsia and eclampsia. We have heard so much in symposiums on eclampsia about types of nephritis that we have almost reached the point where we believe eclampsia is a laboratory problem. Eclampsia is a clinical problem

and I think will remain so; and it is refreshing to hear a man limit his paper to this phase of it. I do not mean that blood chemistry is not important. It is, but the clinical side is the most important.

The more I see of these cases the more I am convinced that focal infection is at the basis of many of them. Abscessed teeth, infected sinuses and diseased tonsils should be investigated carefully in our examination and cleared up. We are following much the same plan in the clinic that Dr. Ransom is, except that we have discontinued magnesium sulphate and favor the use of intravenous dextrose solution. We do this because we feel that the most important point in these cases is not the kidney but the liver. Every patient who dies in eclampsia shows just one typical pathologic finding, and that finding is in the liver, as Dr. Ransom said, an area of peripheral necrosis. Dextrose solution helps to protect the liver and we can use this and at the same time aid in diuresis. When we see a patient in convulsions we prefer the use of sodium amylal intravenously. We have not yet seen a patient whom we could not control with sodium amylal, and I believe it has an important place. After you have practiced the conservative therapy, after you have reached what the surgeon calls the maximum point of improvement, do not leave your patient then. After you find that your patient is as well as she will be until the pregnancy is terminated, take steps to relieve the pregnancy, not by forceful accouchement but by careful induction of labor.

If you will follow these patients for several years following their eclampsia and severe toxemia, you will still find in many cases evidences of residual nephritis; and as we are able to eliminate the infection and improve the patient's general condition, we will find fewer and fewer cases of residual nephritis. Do not neglect your patient when she is through the eclampsia, but do everything possible to improve her condition for this is the best way in which you can prevent the development of a chronic nephritis.

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## The Diseases of the Blood\*

(A Grouping with Reference to the Changes Occurring in the Blood Formative Tissues)

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(Continued from November 15 Issue)

### GROUP III

*The Anemias Due to Delivery of Structurally Imperfect Red Blood Cells (Defective Red Blood Cell Construction)*

- A. Primary Hyperchromic Anemia.  
(Pernicious anemia.)
- B. Primary Hypochromic Anemia.  
(Chronic chlorosis.)
- C. Chlorosis.

A. *Primary Hyperchromic Anemia (Pernicious Anemia)*—In this condition there is a proliferation of megaloblastic tissue in the bone marrow. The normal mature erythrocyte is not produced by this tissue and delivered into the circulation. When the active principle contained in liver is given to a patient with pernicious anemia the megaloblastic marrow is replaced by normal functioning marrow. The work of Castle<sup>25</sup> and his associates<sup>26</sup> satisfactorily demonstrates that there is present in the normal stomach and absent in stomach of a pernicious anemia patient, a substance that is necessary to the normal maturation of red blood cells in the bone marrow. The absence of free hydrochloric acid in the stomach contents is not essential for the failure of its production, as Castle<sup>27</sup> has found it to be absent in the stomach contents of pernicious anemia patients having free hydrochloric acid. The usual presenting symptoms are (1) weakness and fatigue, (2) sore tongue, (3) numbness and tingling extremities, (4) history often reveals the presence of intermittent diarrhea or tendency to loose bowels. The blood should show high color index, macrocytosis, anisocytosis, poikilocytosis, hyperchromasia, low white count, relative lymphocytosis, granulocytes with shift to the right and

multilobular nucleation and diminished blood platelets. The serum should show increased icterus index. The blood, however, may be last in supplying evidence for the diagnosis of pernicious anemia. In addition to the blood findings there are, (1) achlorhydria almost without exception, (2) evidence of past or present glossitis in probably 90 per cent of cases, and (3) careful neurological examination should reveal some evidence of postlateral sclerosis, as demonstrated by diminished vibratory sensation from great toes extending upward, hyperactive or diminished reflexes, the latter depending on the columns in cord chiefly affected. The disease conditions most often confused with pernicious anemia are (1) Anemia due to chronic hemorrhage—the blood picture may imitate very closely pernicious anemia. (2) Anemia due to cancer of the stomach and large intestine, especially in the elderly individual. (3) The anemia of subacute bacterial endocarditis, usually large soft spleen and petechiae are present, and anemia is non-hemolytic. (4) The anemia of chronic infection, notably syphilis. In the anemia of syphilis the index is often above 1, but the anemia is non-hemolytic. The spleen is firm and larger than would be expected in pernicious anemia. (5) Acute hemolytic anemia of pregnancy—free hydrochloric acid usually present, more normoblasts, a tendency to microcytosis and no neurological changes. (6) Aplastic anemia—be circumspect about making a diagnosis of pernicious anemia under 30, especially if there is lack of response to adequate amounts of liver substance. (7) *Dibothriophyllum latum* (fish tapeworm) commonly has free hydrochloric acid. The history of tapeworm infestation, and examination of the stool should further differentiate it. (8) Mistaken neurological diagnosis where postlateral sclerosis is mistaken for tabes dorsalis,

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cerebrospinal lues and multiple sclerosis. (9) The anemia of myxoedema and hypothyroidism. (10) The anemia of chronic nephritis. The last two mentioned anemias will be discussed under the next group.

TREATMENT: 200-300 G. (6-10 oz.) of liver or kidney, or 150-240 G. (5-8 oz.) of fresh mammalian stomach daily, is usually sufficient to induce a satisfactory remission. These substances may be cooked or raw. If given raw grinding in a meat chopper with subsequent mixing of the pulp with orange juice, tomato juice or cold milk after straining to remove the fiber is the usual method of administration. Three to six vials of the liver extract daily produces a comparable result. In giving liver extract it must be remembered that it has only about two-thirds of the potency that it represents in whole liver. A convenient way to determine the proper dose of ventriculin<sup>28</sup> is to allow one vial (10 G.) daily for each 1 M. deficit of red blood cells; e. g., a patient with 1 M. red blood cells would require 5 M.-1 M. or 4 vials of ventriculin. Ventriculin is well taken when mixed with milk. Any superiority that liver extract and ventriculin may have over one another has not been conclusively demonstrated. The maintenance dose required to maintain a satisfactory red blood count is represented by liver extract is from 2-4 vials daily.

Patients with marked arteriosclerosis<sup>29</sup>, acute and chronic infections and patients with marked neurological changes require larger doses of the liver substance, both for induction of remissions and maintenance.

Transfusion in pernicious anemia will probably become a very infrequent procedure since the intravenous and intramuscular administration of liver is now satisfactorily accomplished. The only occasion where it now would seem necessary would be in a practically moribund patient. An intramuscular injection of one vial of specially prepared extract every 7-14 days may be the most satisfactory and economical way to maintain the red blood cell count at a satisfactory level. It has the advantage of control of the patient.

The administration of dilute hydrochloric acid is probably unnecessary and in the doses usually given is wholly inadequate to supply the natural deficit. To be effective at least 20-30 cc. a day should be administered.

Failure in the liver treatment of pernicious anemia is usually due to, (1) Incorrect diagnosis, (2) Insufficient liver, (3) Impotent liver extract, (4) Presence of infections and other complications and advanced arteriosclerosis, resulting in

the lack of reactive response on the part of the bone marrow. If definite focal infections are present they should be eradicated.

B. *Primary Hypochromic Anemia (Idiopathic Hypochromemia*<sup>30</sup>)—In this condition there is a proliferation of the normoblastic and erythroblastic tissue of the bone marrow<sup>31</sup>. Primary hypochromic anemia occurs almost exclusively in woman past the chlorosis age (30). It resembles pernicious anemia in the following features, (1) It is a chronic relapsing type of anemia (2) Free hydrochloric acid is usually absent or present in much diminished amount. Achlorhydria is also present after histamine. (3) Sore tongue, a smooth and atrophied tongue may be present but there is no actual glossitis. (4) Paresthesia is often complained of but a careful neurological examination does not demonstrate actual posterolateral sclerosis.

It differs from pernicious anemia in that (1) The patient has a waxy color instead of the lemon yellow tint of the subicteric individual. (2) No increased hemolysis as indicated by the low icterus index or quantitative van den Bergh. (3) The color index is low, the anemia is hypochromic. (4) The red blood cells are microcytic. (5) It is refractory to liver extract.

Before the diagnosis of hypochromic anemia is made anemia due to (1) chronic hemorrhage, (2) malignancy, (3) chronic infection, especially syphilis, should be ruled out.

TREATMENT: With iron in large doses (Ferric ammon. citrate 6 G. per day and Blands pills 15-18 a day) the response is usually highly satisfactory and as striking as in pernicious anemia treated with liver<sup>32</sup>. After the hemoglobin has been built up to a satisfactory level the patient should take iron at intervals indefinitely, as there is some evidence that an iron deficiency exists<sup>33</sup>. Copper appears to enhance the effect of iron, probably acting as a catalyst, since it does not enter into the combination of the hemoglobin molecule.

Since the primary effect of iron is to produce blood regeneration, and since iron itself cannot supply all the material from which the hemoglobin molecule is constructed, it is necessary to supply this in the diet. This is accomplished by having the patient partake of a diet with generous amounts of red muscle meat, egg yolk, whole wheat products, oatmeal, dairy products, vegetables and fruits. Of the latter two groups spinach, lettuce, cabbage, asparagus, tomatoes, beets and carrots, and apricots, peaches, prunes, raisins and apples are most desirable.

Since liver supplies the substances necessary for the synthesis of the hemoglobin molecule and a

substance effective in producing hemoglobin regeneration, supplementary liver feeding is desirable, especially if a stage is reached in which further improvement is for the time being halted.

C. *Chlorosis*—While a description of the changes occurring in the bone marrow in chlorosis is not available, it is reasonable to infer that in chlorosis a change occurs in the marrow that results in the delivery of an imperfect cell, particularly as to hemoglobin content. Since chlorosis occurs at the age of puberty and because of the presence of skin pigmentation, genital hypoplasia, increased skeletal development and familiar incidence an endocrine factor is thought to be operative. Poor food and hygiene is probably the second important factor in its development. The clinical features are a green pallor, weakness, perversion of appetite, gastrointestinal symptoms, especially constipation, amenorrhea, headache and psychoneurotic tendencies.

The blood picture is that of a low index anemia, .25-50, with hemoglobin as low as 15-45 per cent, and the red blood cell count is between 3-5 M. Marked achromasia is present and very little evidence of blood regeneration.

The condition is becoming a clinical rarity. Improved standards of living, especially as to food, and a more accurate diagnosis of the anemias are both probably responsible for the much decreased incidence.

DIAGNOSIS: Chlorosis may be confused with (1) Chronic anemia due to hemorrhage, (2) Anemia of early tuberculosis.

TREATMENT: The same as primary hypochromic anemia. It is *the second anemia* responding satisfactorily to iron.

#### GROUP IV

##### *The Anemias Due to Defective Blood Formation (The Hypoplastic Anemias)*

- A. Nutritional or Dietary Anemia.
- B. Anemia of Hypothyroidism and Myxoedema.
- C. Anemia of Chronic Nephritis.
- D. Physiological Anemia of Pregnancy.

In this group the bone marrow delivers a structurally perfect or nearly perfect red blood cell, and the deficiency is a quantitative rather than a qualitative one.

A. *Nutritional Dietary Anemia*—A hemoglobin deficiency is present and the red blood count is lowered. It occurs in people on an inadequate diet, and may occur on an exclusive milk diet and more likely to occur in infancy and childhood. There is some evidence of a vitamin A deficiency also<sup>34</sup>.

TREATMENT: *The third anemia* responding sat-

isfactorily to iron. The diet should contain the necessary blood pigment producing substances, supplemented, if necessary, by liver and cod liver oil.

B. *The Anemia of Hypothyroidism and Myxoedema*—The index is about normal. Occasionally it may be a low index anemia but not often. If severe it may clinically resemble advanced pernicious anemia, especially because of the lethargic mental state common to both conditions. It is rather characteristic of this type of anemia to be refractory to treatment until an adequate amount of thyroid substance is given. Of three cases personally seen, one gave a history of having taken large amounts of liver extract for one and one-half years without improvement. A second and third case had taken an adequate amount of iron over a long period without effect. All responded by increase in hemoglobin and red blood cells when thyroid substance was given and the basal metabolic rate raised to a normal figure. Iron and liver were purposely withheld during treatment.

C. *The Anemia of Chronic Nephritis*—The anemia is not due to blood loss through the kidney or albuminuria. It occurs only when renal insufficiency is present, and is the result of nitrogen retention and the depressant effect of the retained metabolites and possibly other toxic substances on the formative elements of the bone marrow. It may be mistaken for pernicious anemia. Hypertension is an almost constant finding and should raise the question. If the possibility of a severe anemia occurring in chronic nephritis is kept in mind, a determination of the non-protein or blood urea nitrogen will decide the diagnosis.

TREATMENT: A very difficult anemia to treat successfully. Unexpected response to large amounts of liver and iron, however, occurs at times. Since meat cannot be given freely, the vegetables and fruits enumerated under treatment of primary hypochromic anemia must be given in generous amounts. Transfusion may markedly improve the situation.

D. *The Physiological Anemia of Pregnancy*—This is usually present at the eighth week, and increases up to the twenty-second week of pregnancy, then improves with a secondary fall before delivery. It may persist for 4-6 months after delivery. Both the hemoglobin and red blood cell formation are affected, but the index is usually considerably lower than 1. The usual index is about .6.

TREATMENT: This is *the fourth anemia* responding satisfactorily to iron. The diet should

be the same as suggested for the treatment of primary hypochromic anemia.

#### GROUP V

##### *The Anemias Due to Infections*

Mechanism of Production Complex. Following may be all operative:

- (1) Defective blood formation.
- (2) Increased blood destruction.
- (3) Nutritional factor.
- (4) Blood loss.

- A. Anemia of acute and subacute septic infection; e. g., puerperal infection.
- B. Subacute bacterial endocarditis.
- C. Acute rheumatic fever.
- D. Diphtheria.
- E. Typhoid fever.
- F. Ulcerative colitis.
- G. Amoebic dysentery.
- H. *Dibothriophyllum latum*.
- I. Tuberculosis.
- J. Syphilis.

Defective blood formation on the part of the bone marrow and blood destruction probably both play a part. If the infection is associated with blood loss the anemia may be severe.

1. The anemia of acute and subacute septic infection may be non-hemolytic or hemolytic, depending on the severity of the process and the infecting organism.

2. The anemia of subacute bacterial endocarditis may be outstanding. It is non-hemolytic. Although blood loss by way of the kidney is present and blood loss from the gastrointestinal tract a possibility, this is insufficient to account for the severe anemia. In view of the rather low white blood cell, granulocyte and platelet count and the non-hemolytic character of the anemia, a much depressed function of the bone marrow would appear to be the essential mechanism of this particular anemia.

3. In anemia of acute rheumatic fever there is a marked reduction of red blood cells and hemoglobin during the first ten days of rheumatic fever<sup>35</sup>. A high grade of anemia indicates a slow recovery.

4. In diphtheria the red blood count may drop 50,000-200,000 per day, together with a corresponding drop in hemoglobin from the 5th to 15th day of the disease<sup>36</sup>, depending on the severity of the infection. Since the general use of antitoxin the severe anemias are not often encountered.

5. The anemia in typhoid fever is probably due to infection, the constant loss of blood from the intestine in small amount and also hemolysis. In

a case observed by Ordway and Gorham<sup>37</sup>, the icterus index was constantly elevated, and the occult blood test of the feces was constantly positive.

6. The anemia in ulcerative colitis is due to blood loss and the infection present in the extensive ulcerations. It is likely to be a severe anemia.

7. The anemia in amoebic dysentery is similar in mechanism of production to that of ulcerative colitis.

8. The *dibothriophyllum latum* (fish tapeworm) produces an anemia that very closely resembles pernicious anemia. Free hydrochloric acid, however, is usually present in the stomach contents in varying amounts. Infestation is most common in Finns and Jewish housewives, and consequently it is in these people that the anemia would be especially looked for. True pernicious anemia in a patient harboring fish tapeworm may be a case of coincidence rather than one of cause and effect.

9. The anemia of tuberculosis is inconstant and of varying intensity. Usually it is rather mild. Exceptionally it is rather striking and may suggest chlorosis.

10. The anemia of tertiary syphilis may have a blood picture that is identical with that of pernicious anemia. The anemia may be of a severe grade and the color index above 1. The anemia, however, is non-hemolytic and the patient usually has a larger spleen than is found in association with pernicious anemia.

TREATMENT: This group does not respond to iron in the manner that the other anemias do that we have discussed. A dietary factor is likely to be operative in the production of the anemia because of the anorexia, inability to eat and faulty assimilation. This factor can be present in varying degree in the first seven anemias discussed in this group.

The anemia due to the *dibothriophyllum latum* obviously requires expulsion of the worm and recovery follows if the anemia is not a true pernicious anemia.

The anemia of syphilis responds strikingly to anti-syphilitic treatment.

In general the course to be followed in the treatment of this group, is, first, adequate treatment of the existing infection, and, second, treatment of the anemia as described under primary hypochromic anemia.

In the acute infectious anemias of hemolytic type repeated transfusions are very effective. In the subacute and chronic anemias due to infections repeated transfusions are less effective than iron and liver, according to Keefer and Yang<sup>38</sup>.

## GROUP VI

*Anemias Due to Blood Loss (The Hemorrhagic Anemias)*

## A. Acute hemorrhagic anemia.

Sources: (1) trauma, (2) pulmonary tuberculosis, (3) peptic ulcer, (4) pelvic from tubal pregnancy, placenta praevia and post partum.

## B. Chronic hemorrhagic anemia.

Sources: (1) gastrointestinal, (2) uterine.

In this group it is assumed that the bone marrow function is normal except for secondary aplasia or exhaustion which may result from chronic hemorrhagic anemia of long duration.

A. *Acute Hemorrhagic Anemia*—In addition to the above mentioned the less common sources of bleeding from the gastrointestinal tract are bleeding from esophageal varices, carcinoma, typhoid ulceration and ulcerative colitis. Acute blood loss may occur also because of purpura and hemophilia. The rapidity with which hemorrhage occurs is an important factor in determining the outcome. If one-half of the blood volume is lost<sup>39</sup> or the hemoglobin drops to below 25 per cent in a sudden hemorrhage it will prove fatal. If the bleeding occurs over a 24-hour period, two-thirds of the blood volume may be lost and the hemoglobin drop to 15 per cent before death results. The important point always is how much blood has been lost and how rapid the loss.

The blood pressure<sup>40</sup> is a good indicator of blood volume. A blood pressure below 95 S. indicates a blood volume probably under 70 per cent. A reading of 70-80 S. means that the blood volume is probably under 60 per cent. A reading of 65 S. should be regarded as a critical pressure.

The changes that take place in the vascular bed after acute hemorrhage are<sup>41</sup> (1) Reduced blood volume, (2) Dilution of the blood as blood volume is restored, (3) Two forces are active, one to restore blood volume and the other to keep the hemoglobin above the critical 20 per cent. The first is the more active when the hemoglobin is higher. (4) Variations in hemoglobin are now understood as dilution phenomena. A drop in hemoglobin may occur after transfusion in acute blood loss, if blood volume is only partly restored. The hemoglobin and red blood count may be lower two weeks after a hemorrhage than a few hours after and two or three months may elapse before the normal is reached. The hemoglobin remains relatively lower because its regeneration is slower than that of the red blood cells.

Blood regeneration begins almost immediately after hemorrhage. The laboratory evidence of the increased bone marrow activity is as follows:

(1) An almost immediate leucocytosis of 15,000-40,000. The white blood count remains elevated for a week or more.

(2) The platelets rise rapidly the first 24 hours and may go up to a million in two days.

(3) The immature cells in the circulation, especially the reticulocytes, which may rise to a level of 10-25 per cent, depending on the level of the hemoglobin. The latter figure may be attained if the hemoglobin is low.

TREATMENT: The hemoglobin and red blood count, when taken shortly after a hemorrhage, is not as reliable an indicator as to the severity of hemorrhage as the blood pressure. Due allowance, of course, may be made for pre-existing hypertension and possible hypotension. In hypertension the loss of one-half of the usual systolic blood pressure would be an indication of a critical level.

The estimation of the blood volume is most important and from this the approximate total hemoglobin may be obtained<sup>42</sup>. If, for example, as previously stated, the blood pressure is 70-80 S. the blood volume is probably not over 60 per cent. If the hemoglobin reading is 40 per cent the total hemoglobin would be 60 per cent of 40 or 24 per cent. This figure indicates that transfusion is necessary. If above 25 per cent blood volume can be restored with acacia or hypertonic glucose solution. A blood pressure below 90 S. indicates immediate need for increased blood volume.

The great principle in the treatment of hemorrhage is restoration of blood volume. This is accomplished by forcing fluids and transfusion. Intravenous infusions temporarily restore blood volume until transfusion can be given.

B. *Chronic Hemorrhagic Anemia*—The usual sources of blood loss are, (1) From the gastrointestinal tract, especially hemorrhoids, (2) Uterine bleeding. The hemorrhage in the first instance may be overlooked by the refined bathroom manners of the individual, and the second may be elicited only by careful questioning, especially if the patient is a middle aged, sensitive maiden lady.

The blood picture resembles that in acute blood loss, except the signs of blood regeneration; namely, leucocytosis, increase in platelets, reticulocytosis, polychromatophilia and presence of normoblasts are not so evident. As exhaustion of the bone marrow appears leucopenia, low platelet count, lack of young cells, microcytosis and poikilocytosis make their appearance.

If the blood loss continues over a long period of time, a blood picture closely resembling pernicious anemia may be produced.

TREATMENT: This is the *fifth anemia* that re-

sponds satisfactorily to the administration of iron in large doses. The diet should be the same as described under the treatment of hypochromic anemia.

#### GROUP VII

##### *The Anemias Due to Blood Destruction—(The Hemolytic Anemias)*

- A. Acute hemolytic anemia; e. g., Brill's disease.
- B. Acute hemolytic anemia of pregnancy.
- C. Chronic hemolytic icterus.
  1. Congenital.
  2. Acquired.

In the hemolytic anemias the bone marrow is primarily not defective in its blood producing functions. Such changes as do occur are the result of accelerated function.

A. *Acute Hemolytic Anemia*—A rapid, high index anemia with marked increase in serum bilirubin that may be mistaken for pernicious anemia. The acute febrile anemia with enlarged soft spleen and hyaline thrombosis of the capillaries (Brill's disease) is a type. It may occur also as a result of severe infection.

B. *Acute Hemolytic Anemia of Pregnancy*<sup>42</sup>—This is a rare disease, and occurs only in about 1-5,000 to 10,000 pregnancies. It is generally assumed that a toxic hemolysin is elaborated during pregnancy, and acts on a previously damaged marrow. This is a reasonable hypothesis, since a slight hemolysis is present in normal pregnancy.

When the anemia is severe the patient presents the picture of severe pernicious anemia, including the swollen legs. The edema is outstanding. The blood is like that of pernicious anemia, except there is more microcytosis. Neurological signs are absent as a rule. Free hydrochloric acid may or may not be present. A sore tongue is common. It is a severe disease with 50-75 per cent mortality. When recovery takes place it is months after the termination of pregnancy. It must be differentiated from (1) physiological anemia of pregnancy, which should be possible because of the benign character of the one and the severity of the other, (2) The anemia of toxemia of pregnancy. This is a low index anemia, (3) Pernicious anemia existing prior to pregnancy by the fact that in this the anemia is macrocytic and post-lateral sclerosis would be expected to be present, (4) Mild chronic hemolytic icterus may simulate acute hemolytic anemia of pregnancy to a remarkable degree when present in a pregnant woman. The reticulocytosis, a firm instead of a soft spleen, and the constant urobilinuria in chronic hemolytic jaundice are the deciding diag-

nostic points. Fragility of red blood cells and microcytosis is found in both conditions.

C. *Chronic Hemolytic Jaundice*—(1) Congenital and familial, (2) Acquired.

The clinical features of this condition are (1) Anemia due to blood destruction, (2) Acholuric jaundice, (3) Enlargement of the spleen, (4) Increased reticulocytes, (5) Microcytosis with high content of hemoglobin, (6) Increased fragility of red blood cells, (7) Constant presence of urobilin in the urine, (8) The frequent presence of gallstones.

TREATMENT: The acute hemolytic anemia should be treated by frequent transfusions.

The acute hemolytic anemia of pregnancy requires (1) repeated transfusions, especially after delivery, (2) liver diet, especially whole liver, (3) induced labor should not be considered. Spontaneous labor is accomplished without much blood loss, and is more favorable for the patient than induced labor.

In chronic hemolytic jaundice the one method of treatment indicated is splenectomy. The results are probably more favorable in the congenital than in the acquired type.

Recapitulation: In differentiating the diseases of the blood, the following are the important diagnostic procedures:

1. Careful history often reveals blood loss, especially from peptic ulcer, hemorrhoids, menorrhagia and metrorrhagia and abortion. History of paresthesia, history of sore tongue and diarrhea often furnishes the clue to the eventual diagnosis of pernicious anemia.
2. Careful inspection of sclera and tongue.
3. Complete blood count and study of the blood cells. Platelet count and determination of bleeding and clotting time.
4. Biliary index, or inspection of blood serum.
5. Examination of stomach contents for free HCL.
6. Proctoscopic examination and examination of stool for occult blood.
7. Pelvic examination.
8. Wasserman test.
9. Careful determination of size of spleen.
10. Minimal neurological examination for evidence of combined degeneration.

#### DISCUSSION

DR. J. E. HETHERINGTON, Grand Forks: Dr. Altnow has so completely covered this subject that I shall not have much to add in discussing it.

No so long ago hematology was of mere academic interest. It was a nice thing to examine the blood and determine just what type of disturbance was present; today, however, blood examination is no longer of

merely academic interest but is a necessity for the advantage of the patient.

Dr. Altnow spoke of the hypochromemias, which is a good point. These so-called idiopathic hypochromemic anormias slowly respond to large doses of iron.

I was glad to hear him bring out the point regarding chlorosis. Years ago we were told this was a common thing, that every physician saw lots of these cases, the asthenic type of pale, bloodless girl. In some considerable blood work over a period of years we have observed only one case of chlorosis. These girls are not the thin, frail type. They have not lost weight but tend to put on weight. Their breasts are large. Instead of having a profuse menstrual flow these girls, if there is any change at all, tend to have an amenorrhoea. It has been claimed that the seat of the trouble is in the ovary. Strangely enough, it responds to iron.

In polycythemia there must be a careful differentiation between polycythemia vera and the one due to some constitutional disturbance. Phenolhydrazin in polycythemia vera, in sufficient dosage, does well and many satisfactory results have been reported. Joseph Connerly, of New York, has reported quite a series of these cases in which satisfactory improvement was obtained with this drug. I think at the Mayo Clinic they give the phenolhydrazin in large doses. A sharp rise in the white count is a definite signal to reduce the dose or omit the drug temporarily. Splenectomy is not so satisfactory in the acquired type of hemolytic icterus, as it is in the hereditary type.

Dr. Altnow spoke of the mortality rate in agranulocytosis. That is certainly a vicious, death-dealing affliction. Some months ago Dr. Henry Jackson, Jr., at the Thorndyke Memorial Hospital started using a nucleotide preparation. In 1924 Dr. Jackson announced that nucleotides existed in the blood, and that in agranulocytosis they disappeared from the blood. Now he has advised a nucleotide, which he is using. The mortality rate is very high but in a series of twenty cases, thirteen of which were typical cases, following the disappearance of the granulocytes from the blood fourteen cases out of the twenty recovered. I have had the opportunity of using the nucleotide K96 in one case and on the fifth day the white count was increased to nearly 6,000. One case, of course, is no guide but I think Dr. Jackson and his associates at Harvard have given some valuable advice and have obtained a valuable remedy in this disease.

In the treatment of purpura Dr. Held advises in addition to the whole blood subcutaneously and blood transfusions that roentgenotherapy be used over the spleen in controlling the bleeding time previous to surgery. In one case observed a month or so ago we were unable to control the bleeding and the patient succumbed to the blood loss.

As to acute infections, mononucleosis. It occurs with sufficient frequency for us to be on the lookout for it. We should be criticized if we go into a home and find such a case and do not make careful blood examinations. The prognosis is good. It requires several months to

get a normal blood picture, but the clinical picture changes quite soon—a matter of a few weeks.

The lymphocytes in this disease have been classified by Downey into three types, one type irregular in shape; the second larger than normal, resembling the plasmocyte, and the third still larger, resembling the leukemic cell.

Pernicious anemia we are all interested in and I believe the study of the volume index will give us more accurate information than depending too much on the color index. These hemaglobin determinations are very crude when we use a Dare hemoglobinometer, and I think we might as well look at a patient's eyes and guess at it. The Sahle apparatus is better than the Dare, and we consider the Newcomer still better than the Sahle.

In giving the liver extract in pernicious anemia I find that previous to the reticulocyte rise we get a sharp rise in the uric acid of the blood. Occasionally some of these patients on large doses of liver extract develop quite typical lesions of erythema nodosum, and I have found that reducing the dose of liver extract relieves the symptoms of erythema nodosum.

Dr. Altnow says he does not use hydrochloric acid. I cannot help feeling that hydrochloric acid in suitable dosage three times a day will improve these cases. I believe this is especially true in the patient having several loose stools daily. I would like to have Dr. Altnow's opinion on that, and also on the erythema nodosum nodules. One thing that is very important is the differential diagnosis between the anemia of the tabetic and pernicious anemia. The spinal cord changes may be very similar and the tabetic patients may have an achylia. Spinal puncture should be done and the usual tests made.

Speaking of the anemias due to hemorrhage. In typhoid fever we all expect the patient to have some epistaxis but a case referred to me by Dr. Healy last fall almost bled to death from the nose. The patient was pulseless and cold when I was called to see her at the hospital. She was stimulated and later transfused. That was the first time in typhoid fever that I had seen dangerous hemorrhage occur from nose bleed.

The anemia of pregnancy. McQuarrie considers all of these as toxic. Hofbaur claims that all anemias of early pregnancy are due to a syncytial hemolysin produced in the chorion. After a time this is overcome. I know through Dr. Moore's careful studies that the anemias of early pregnancy do occur and may be very severe. There is no reason why a patient may not have an aplastic anemia previous to her pregnancy.

DR. C. B. WRIGHT, Minneapolis: I would like to say just a word about one type of anemia mentioned by Dr. Altnow. That is so-called primary hypochromic anemia.

Pepper feels that all of these anemias are secondary to something, and the more carefully we study our patients from the standpoint of etiology the more of them will be found to be secondary. Recent work has shown that the predominant number of these cases occur in middle aged women. That is women in the later menstrual age, and recover with the menopause.

I have been particularly interested in this phase of the subject and feel that we are not giving enough attention to menstrual disturbances as an etiological factor in these cases. These disturbances may be due purely to endocrine causes associated with dysfunction of the ovary, pituitary, thyroid and possibly the spleen. Graves claims that thrombocytopenia purpure hemorrhagica is three times as common in women and menorrhagia may in some cases be the only symptom. This condition should be looked for in these chronic anemias of women.

It is well known that intra-mural fibroids are common in women beginning about 30 and increasing up to the menopause. The history these women give cannot be depended upon. They will give a history of scanty menstrual flow for years and then come in with a profuse flow and we find a definite fibroid. The pelvic examination may be entirely negative for a long time and after 10 years definite fibroids found with complete cure of the anemia with X-ray or hysterectomy.

In a series of 600 cases coming in routinely with gastro-intestinal complaints there were sixty-seven cases of obscure anemia that we could not explain on the basis of hemorrhage, infection, and so forth. In this series we found that more than half had a definite pathologic condition in the pelvis that explained their anemia and practically all that could not be explained on the basis of pelvic pathology could be explained on some other basis such as diet, functional gastric disturbances, low grade chronic infections, hypothyroidism, chronic chemical poisoning, constitutional diseases and so forth.

Iron in sufficient dosage will bring up the blood in these cases but it will not keep it up. The cause of the anemia must be diligently sought for in every case and removed if we expect any permanent cure and I agree with Pepper that if the cause is carefully enough looked for it will be found as a rule.

The diagnosis in these cases takes plenty of time, an exceedingly careful history, a thorough physical examination, adequate facilities for blood studies and a competent hematologist, and finally, one is justified in using sub-total sterilization by the X-ray in women in late menstrual life where nothing is found in the pelvis by curetment if no other cause for the anemia can be found after careful study and trial of other procedures.

DR. H. O. ALTNOW, Minneapolis, Minn. (closing): I am pleased to have Dr. Hetherington call attention to Dr. Jackson's use of, and also his own experience with, nucleotide K 96. I have had no personal experience with the use of the pentose nucleotide, but results such as those cited warrant further clinical trial. (Since the above discussion Jackson and his associates publish in the Jour. Amer. Med. Assn. 99: 163, July 9, 1932, their results to date of 58 cases of malignant neutropenia treated with pentose nucleotide of which 41 or 71 per cent recovered. In a former untreated series the mortality was 80 per cent. Forty-three cases were classi-

fied as agranulocytic angina. The mortality was 65 per cent in this series.)

In speaking on the cytology of acute benign lymphadenosis I described the predominant type of cell so as to keep the diagnostic picture as clear as possible. The cell described is the one that stands out in the stained blood smear and it is this cell that the clinician will recognize and by which make the diagnosis.

Dr. Hetherington spoke of the use of hydrochloric acid in pernicious anemia. In the type of patient he mentions hydrochloric acid can be used to good advantage. The usual experience is that when the anemia is adequately treated with liver extract or ventriculin the gastro-intestinal symptoms are controlled. I have not seen the typical lesions of erythema nodosum occurring during liver therapy in pernicious anemia. I have, however, seen skin lesions of a chronic viticarial nature which I felt were on an allergic basis due to sensitization to the proteins in the liver extract.

Dr. Wright introduces a viewpoint concerning hypochromic anemia that certainly deserves consideration. If the diagnostic criteria are closely adhered to the diagnosis of primary hypochromic anemia will not very often be made. From the relatively few cases that we have seen I would say off hand that pernicious anemia occurs about five to ten times more frequently.

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## Proceedings Minnesota Academy of Medicine

Meeting of October 12, 1932.

**T**HE regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, October 12, 1932. The meeting was called to order at 8 o'clock by the President, Dr. J. C. Litzenberg. There were 43 members and 1 visitor present.

Minutes of the May meeting were read and approved.

The scientific program of the evening was as follows:

Dr. F. C. Rodda (Minneapolis) read his Inaugural Thesis entitled "Intussusception."

### DISCUSSION

DR. IRVINE McQUARRIE (U. of M.): There is nothing whatsoever that I can add to this paper from the point of view of the pediatrician, but I want to congratulate Dr. Rodda on its composition, its inclusiveness and the judgment that is back of this from his own experience. I would simply like to emphasize the importance of those points which are particularly the pediatrician's province, i.e. the after-care of the patient and the early diagnosis which, as Dr. Rodda pointed out, may be made even by the experienced mother. We at the University Hospital frequently have occasion to see patients too late as many of ours are sent in by doctors out in the country who have not had extensive experience with the condition. Dr. Rodda is now giving lectures on the subject to our students and, therefore, these patients should get into the surgeon's hand earlier when these young men get out in practice. Students ought to be taught to develop a reflex of thinking of that condition immediately when such symptoms as intermittent crying and the postural reactions described by Dr. Rodda first occur. I have wondered if a case ever occurs in which there is no pain. Probably not. I think his idea about abnormal enervation being a possible etiological factor is a very good one. I wish that we had some more definite way of determining that. For instance, I have wondered how an intussuscepted bowel would react following spinal anesthesia.

DR. A. C. STRACHAUER (Minneapolis): The diagnostic import or necessity of finding a tumor in the lower right quadrant of the abdomen in establishing the diagnosis of intussusception has been overly emphasized in my opinion. The symptoms are so definite and characteristic that the finding of the tumor is usually quite unnecessary. As a matter of fact, from my personal experience, I have not found tumors in the lower right quadrant. Intussusception in infancy is usually ileocecal in type and not infrequently ileocecolic. Under both these circumstances tumors,

when found on palpation, even after the abdomen is open, are located in the upper right quadrant, lying underneath the liver.

DR. A. T. MANN (Minneapolis): I have palpated these tumors in the right side of the abdomen from intussusception at the ileocecal valve. They lie rather closer to the midline than the normal position of the cecum and ascending colon. The reason for this is the pull on the mesentery of the entering ileum as it is drawn into the cecum and ascending colon as the intussusception progresses. The root of the mesentery is fixed at the back of the peritoneal cavity somewhere nearer the midline. It is a natural sequence that the mass, when felt, should be somewhat nearer the midline.

In regard to the question of pain as a symptom, I believe that any one of the usual symptoms of intussusception can be absent in special cases, though not all the symptoms can be absent. I recall the report of one case in which pain was stated to have been absent.

DR. OWEN H. WANGENSTEEN (U. of M.): In America a personal experience of 80 cases of intussusception is almost unrivaled. In Australia, England or Denmark, where intussusception occurs far more commonly, 80 cases in one man's experience is not unusual.

In cases brought to the University Hospital, a not infrequent cause in delay is found to be subsidence of vomiting after its initial occurrence. I have been told by several physicians that they were dissuaded from their initial suspicion of the existence of intussusception because of cessation of vomiting, and often despite the continuance of other symptoms as intermittent pain, blood and mucus in the stool and a palpable tumor. In his very informative paper on intussusception of eleven years ago, the late Dr. Amos Abbott, a keen observer whose experience in the surgery of children was considerable, directed attention to this confusing factor. He states that 100 per cent of his infants with intussusception vomited initially but that in 81 per cent vomiting was not resumed until after the second day. The cause of this abatement in vomiting is somewhat obscure. In looking over a number of records of patients with bowel obstruction, I have been amazed to see how many patients with obstruction of the sigmoid flexure never vomit despite enormous distension. The distension in such instances is almost limited to the colon, due to the proximal competent ileocolic sphincter. Undoubtedly the regurgitation factor is an important one in the determination of the amount and frequency of vomiting in bowel obstruction. An obstruction in the small intestine is more likely to have continued vomiting, there being no competent sphincters proximally to dam back the intestinal content. In intussusception, obstruction occurs at the apex of the intussusceptum, not essentially a mechanical block of

the lumen but as the result of edema of the invaginated gut occasioned by compression of the inner cylinder and its mesentery by the ensheathing cylinder of gut. These invaginations begin usually at the ileocecal angle, and the natural inference concerning the cause of delay in recurrence of vomiting is that the low position of the obstruction necessitates the elapse of some time to convert the initial reflex vomiting into a mechanical regurgitation.

However, if the mother's story is attentively heard and care is exercised in examining the abdomen, the rectum, and the motions of the infant, as Dr. Rodda described so well, an early diagnosis should be made almost invariably. There is one point in the differentiation of strangulation from simple types of obstruction that does not obtain in intussusception. I refer to local tenderness of the abdominal wall. Unlike other strangulation varieties of obstruction, no blood escapes into the peritoneal cavity in intussusception because the gut whose blood supply is compromised is surrounded by the normal ensheathing layer. Hence there is ordinarily no tenderness of the abdominal wall, though the parietes may be rigid during the painful spasmodic contraction of the gut.

I have seen a few cases presenting features of shock as Dr. Rodda mentioned. Last winter a female infant of 18 months with intussusception was admitted to the University Hospital with a pulse of 200. The liberal administration of parenteral fluids did not improve her as a risk. She was then transfused, being given about 300 cc. of blood. The pulse rate dropped to 160 and its quality improved correspondingly. A compound intussusception (entero-enteric due to a Meckel's diverticulum and an ileocolic) was reduced at operation and the patient convalesced uneventfully. In the experimental laboratory, Dr. Horace Scott and I have been able to show that the blood loss factor may be significant in strangulation types of obstruction, such as intussusception in which interference with the blood supply of the bowel occurs. Ligation of the veins to a 3 or 4-foot segment of gut in a dog usually results fatally after four or five hours. The arteries being intact, under the motive force of systolic blood pressure, blood is driven into the infarcted bowel and the animal bleeds to death into his own gut. In clinical strangulation obstructions in which the constricting agent completely arrests the venous outflow, the blood loss factor is an important one, and transfusion is a remedial agent of value in its correction.

I have been bold enough to attempt conservative reduction in a few cases of intussusception. In only a few instances, however, has it been wholly successful. Usually its merit lies in this: instillation of fluid into the rectum chases the intussusception back, so that the surgeon has less to do at operation. In the use of a thin barium enema, the "Achilles' heel" of Hirschsprung's taxis is avoided, in that one can see whether the gut that has telescoped into the colon is completely driven back. Olsson and Pallin, of Einar Key's Clinic in Stockholm, were the first to advocate and practice the

method. Barium is allowed to run into the rectum under the influence of three and a half feet of gravity pressure, no piston pressure being employed. Failure to fill the cecum fluoroscopically with barium is indication for immediate operation. The earlier the intussusception the more likely is this conservative method to succeed. I have seen no harm come from its use. Simple intussusception, as Dr. Rodda pointed out, is an affliction of the first year of life and most commonly occurs between the fourth and ninth months. After this age period, compound intussusceptions (entero-enteric and ileocolic) are prone to occur and the method is not to be relied upon.

Hipsley of Sydney, who may boast the best surgical results in the treatment of intussusception (51 successive successes in cases under 36 hours' duration, *Medical Journal of Australia*, 1918) reported in 1926 acquaintance with the conservative method. Of 105 cases, he was able to reduce 62 without operation with a single death in the group. He advises its routine trial before operation. Hipsley's colleague, Clubbe, who has written an authoritative monograph on intussusception, states that he has been successful in only 10 per cent of instances with the conservative method but employs it regularly to chase the invaginated gut back before making the incision.

No matter where the intussusception presents, the incision should be made on the right side. A short incision almost invariably suffices. With one finger within the abdomen beneath the gut and by a massaging motion of the other hand on the outer surface of the abdominal wall, the intussusception is usually driven back with ease. No attempt should be made to draw the intussusception out of the abdomen until the cecum is reached. To do so necessitates a long incision and the bowel has to be pushed back into the abdomen to negotiate the splenic and hepatic flexures. As the last of the invaginated gut is pushed back, a deliberate attempt should be made to press out and evert the dimple that represents the start of the intussusception.

With early diagnosis and treatment the mortality should be very low in this variety of intestinal obstruction.

DR. J. C. LITZENBERG (Minneapolis): I would like to ask Dr. Rodda why the baby is turned over on his face.

DR. RODDA: That is the posture the child assumes during the attack of pain. After the pain has passed over, the child relaxes, assumes a normal posture and at times gets up and goes on with its play.

Mr. Byron J. Olson (University of Minnesota Medical School) winner of the Academy's Prize Essay, by invitation read his Thesis entitled "The Role of the Eosinophil in Immune Reactions."

#### DISCUSSION

DR. W. P. LARSON (U. of M.): I think Dr. Olson's paper emphasizes the point that new and perhaps radical ideas come from the younger generation. I have been in close touch with Mr. Olson's work, and can attest

to the care with which he has carried out his experiments. I have been amazed at some of the results he has obtained. The part of his work which has been of most interest to me is that which he has done with eosinophil granules.

Mr. Olson has perfected a technic of obtaining eosinophil granules in quantity from the blood of horses. This blood he has secured from the abattoir of a fox farm where a large number of horses are constantly being killed. With the granules thus obtained he has been able to produce anaphylactic reactions with various foreign proteins without previous sensitization of the experimental animal. So far as I know, this is the first work in which the anaphylactic substance has been produced in vitro, a result which I am sure will have far-reaching consequences. Mr. Olson's work seems to furnish experimental support for the view, which has been held for years by many investigators, that the eosinophil does play an active part in various anaphylactic and allergic phenomena.

In treating the various pollen extracts with eosino-

phil granules, Mr. Olson has likewise been able to obtain positive skin reactions to these pollens in cases which are not susceptible to hay fever or other atopic conditions.

In the short time allotted to Mr. Olson for this paper, he has only had time to present his work in an abbreviated form. I hope that in the near future it will be our good fortune to have the pleasure of reading his published papers.

DR. LITZENBERG: I think the Academy should feel very happy about awarding the essay prize to Mr. Olson and for having the privilege of hearing his fine, though necessarily sketchy, analysis of the work he has been doing. We are glad to have even a little part in such a piece of work.

Dr. C. N. Spratt (Minneapolis) reported a case of "Intracranial Aneurysms of both Vertebral Arteries." Autopsy specimen was shown.

The meeting adjourned.

R. T. LAVAKE, M.D., Secretary.

## Proceedings Minneapolis Clinical Club

Meeting of October 13, 1932

**T**HE REGULAR monthly meeting of the Minneapolis Clinical Club was held in the Lounge of the Medical Arts Building on Thursday evening, October 13, 1932. After dinner, the meeting was called to order by the new President, Dr. Archie H. Beard.

Following a brief business meeting, the following scientific program was given:

Dr. Rae T. LaVake read a paper on "The Cause and Treatment of the Toxemias of Pregnancy" (Published in the *JOURNAL-LANCET*, Nov. 1, 1932). Dr. O. J. Campbell read his Inaugural Thesis "The Conservative Treatment of Cystic Disease of the Breast" with a series of slides from the simple to the very complex forms of benign disease and those showing malignant change.

### CAUSE AND TREATMENT OF THE TOXEMIAS OF PREGNANCY

(Published in the *Journal-Lancet*, Nov. 1, 1932)

DR. R. T. LAVAKE

#### SUMMARY

When the spermatozoon fuses with the ovum, an organism is evolved whose cells may or may not be relatively toxic to the maternal organism. When toxic, it is the exo and endotoxins of these cells that cause the toxemias of pregnancy.

The treatment of light cases of early toxemia consists of: clearing up all areas of focal infec-

tion, a high carbohydrate diet, fresh air, attention to elimination, psychotherapy, rest, and bromides to reduce the irritability of the nervous system. More severe cases should be confined to bed, food and fluid by mouth interdicted and glucose and water given by retention enemas, proctoclysis or intravenously. When the toxin shows evidences of being very potent and the mother shows little immunity, nothing short of a therapeutic abortion will avail. Indications for therapeutic abortion are found in the pulse, the mental condition, and signs of myelitis.

In regard to late or preeclamptic toxemia, all agencies that will tend to limit infarction or necrosis of the placenta will act as prophylactics against this toxemia. Such agencies are: elimination of focal infection and the protection of the mother from general infection of any type, and, if a chronic nephritis obtains, a diet that is likely to keep down blood metabolites.

In the treatment of late toxemia, attention to the eliminative channels, high carbohydrate diet, fresh air, and rest are as important as they are in early toxemia.

In severe cases, in the interest of both mother and child, the crucial point in treatment is the decision as to when and how the pregnancy should be terminated. If the fetus and placenta are allowed to remain in the uterus too long, overwhelming and irreparable damage may be sus-

tained by the vital organs of the mother; and the fetus may die because of asphyxia and interference with assimilation and elimination due to further infarction of the placenta, or may die from the products of maternal toxemia.

Indications for the termination of pregnancy are found in urine, blood-pressure, eyegrounds and convulsions.

#### DISCUSSION

DR. DORNBLASER: I enjoyed Dr. LaVake's paper very much. It was excellent. It seems to me that we have been a little too slow in recognizing the danger signs of pre-eclampsia. We have been a little slow at times in emptying the uterus. The kidneys can throw off a certain amount of toxin and they cannot throw off any more. If they are working to their full capacity and then are deluged by an increasing amount of toxin from the placenta and the products of conception, they cannot carry the load.

Some people have had the conception of the pathological changes found in this condition being due to a primary thrombosis of the peripheral vessels in the liver because of an increased viscosity of the blood due to the increase of toxin in the blood. If that is true, isn't it rather interesting that the amount of protein, broken down and absorbed from the intestinal tract and carried to the liver, is about all that can be taken care of by the body and when the protein poisons come from the placenta they are more than the system can counteract and cause a higher blood concentration than normal. The effect on the kidney is a cessation of elimination and ischemia of the vessels because of the swelling of the glomerular tuft. The increased viscosity of the blood and a narrowing of the arterial lumen markedly slow up the circulation. All of these factors allow the toxins to pile up in the maternal organism until the patient is overwhelmed by them. Elimination is the treatment of choice. When it is found that the toxins are accumulating in spite of the active elimination, abortion should be done.

DR. ROY SWANSON: Whenever I think of toxemia I always think of what some man of the past said, that humanity could be divided into three classes—men, women and pregnant women—pregnant women could be divided up into two classes, toxemia and non-toxemia.

I do not believe that I have ever heard a more classical discussion of this subject. It is satisfactory, it gives a man courage to approach the treatment of his severe cases, it gives him an understanding of what the thing is all about and I think it makes you more honest in the treatment of toxemia. I think this was a most scholarly presentation.

DR. BEARD: I would like to ask Dr. LaVake how frequently toxemia appears after a first pregnancy.

DR. MCCARTNEY: We have made a second good start this year.

Dr. LaVake referred to Dr. Bell's work on kidneys and toxemia. He also referred to the specific character of the lesion in the kidney. I have seen Dr. Bell be handed a section of a kidney and all he needed was one

glance at the kidney to know it was from the toxemia of pregnancy. There was no question about it—a one-glance diagnosis as far as he was concerned. He feels that this change in the kidney is not the cause of the toxemia in any way but merely a result of the circulating toxemia, a result of the condition and not in any way the cause.

DR. BEARD: Allergy is very interesting as a possible cause of the trouble in this condition. If there is an incompatibility of the mother and father because of some protein poisoning it seems to me the higher percentage of toxemias should occur in the primipara. I realize the picture may be changed in later pregnancies by bacterial invasion from some recent colds and infections which could easily be the cause of the difficulty in these individuals. The interesting work with blood studies that Dr. LaVake is planning to carry out this year probably is well worth while. It might be interesting to test the mother with the blood serum of the father by some kind of a skin test as is used in other cases of allergic reactions. It might be interesting also to test these individuals with various bacteria. In that way it might be possible to pick up the offending cause as we do at times in other types of toxemia due to some protein desensitization.

DR. LAVAKE: Let me first answer the question as regards the relative frequency of toxemia among primiparae and multiparae.

Three out of every five cases of pre-eclamptic toxemia are found in primiparae. Although we are always suspicious of the increased likelihood of toxemia in a patient who has had a toxemia in an earlier pregnancy, it may not obtain in a later pregnancy. Conversely we may have toxemia in a late pregnancy with no toxemia in the early pregnancies. To my mind the fact that a patient has had a toxemia should direct our attention to the likelihood of present toxic products of conception and to the likelihood of residual lesions in the kidneys. If we can limit placental necrosis, however, the toxic placenta may be delivered at term before the products of its necrosis may have a chance to cause a severe toxemia in the present pregnancy. What I have tried to stress is the practical importance of infection as a cause of placental necrosis and as a common precursor of pre-eclamptic toxemia.

So many times in going through hospitals in different cities I am told that no history of infection preceded the accession of toxemia in a patient and in the discussion an intern will speak up and mention the fact that the patient did have a bad cold immediately preceding the accession. It was not considered important enough to enter it in the history. Infections in pregnant women are very important. Recognition of this fact has averted disaster many times in my experience. For example, I had a patient in this town whom I had followed through two perfectly normal pregnancies, labors and puerperia. During her third pregnancy she developed what her internist designated as the "Flu." This led me to follow her with increased care as regards the possible accession of toxemia. In her seventh month, a week after blood pressure, urine, weight, and all other signs

had been normal, she called me up to inquire what she should take for a headache. She and her husband were all dressed to go to a dinner and she had this slight headache that annoyed her. To make a long story short, I insisted on seeing her immediately and found her blood pressure 240 systolic and her urine almost boiling solid. Only her history of infection prevented me from acceding to her wishes and prescribing some headache medicine.

DR. WYNNE: How many of your patients in toxemia have pyelitis?

DR. LAVAKE: I haven't the figures concerning the number of toxemia patients that have pyelitis. About one in ten women, some time during the pregnancy, will show some form of pyelitis. A few of them will clear up under treatment but the majority will not until after delivery.

DR. WYNNE: Do you look for toxemia in these women?

DR. LAVAKE: Absolutely, any type of infection appears to increase the chance of pre-eclamptic toxemia.

### THE CONSERVATIVE TREATMENT OF CYSTIC DISEASE OF THE BREAST

*(Abstract of inaugural thesis presented before the Minneapolis Clinical Club by Dr. Orwood J. Campbell, paper to be published elsewhere).*

The widest range of opinion still prevails as to what constitutes true conservatism in the treatment of cystic disease of the breast. Those believing cystic disease to be a pre-cancerous lesion find conservatism to rest in frequent radical operations for borderline tumors and frequent simple amputations as prophylactic means against cancer. Those basing their concept of the disease on follow-up results rather than on microscopic criteria, believe in exploratory incisions, limited operations and only occasional amputations.

An analysis was made of 64 cases of cystic disease of the breast treated at the University Hospital. The average age was 40.6 years. Pain was a prominent symptom in eleven cases and discharge from the nipple in six. In fifteen cases local or diffuse adenocystic disease was present while the remaining cases represented simple forms of cystic disease in which hyperplasia was limited or absent.

There were two radical operations, six simple amputations and the remainder were treated by local excision. Follow-up information was secured in thirty-nine cases. Twenty were followed from five to fifteen years and nineteen from two to five years. In none did cancer subsequently develop. The results in the whole material are consistent with and lend support to the opinion prevalent in the department of surgery and the department of pathology, that cystic disease is not a precancerous lesion.

Evidence is furnished that pathologists in the light of clinical experience with cystic disease are revising their diagnostic criteria. There can never be any compromise with the dictum that in case of doubt the complete operation must be done. Nevertheless, the evidence warrants a more liberal interpretation of the microscopic picture in favor of benignancy.

The writer outlines his concept of the conservative treatment of cystic disease and bases it on the fear that malignancy may be present at the time of examination rather than the fear that malignancy will subsequently develop.

DR. BEARD: The internist very often is the first one to see these cases. It is as much a problem for the internist as it is for the surgeon. The surgeon usually is called in on consultation; it is well the internist and the surgeon have the same ideas concerning the possible pathology in order to come to some co-operative understanding. It is very essential that both the internist and the surgeon in any case of doubt between the two have a section of the tissue involved. In the end it should be up to the pathologist for final decision. If it is decided in these cases that the individual does not need surgical interference, the patient should be warned to have the area involved watched very carefully. I feel one individual should never take the responsibility alone with these cases if he does not think surgery is indicated.

DR. LAVAKE: This is a most interesting and important paper. Three years ago Dr. William Seaman Bainbridge, of New York, read a somewhat similar paper at the annual meeting of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons, making what seemed to me a plea for diagnostic judgment and conservatism. This paper was severely criticized by some men present. My experience led me to agree with his stand and with the stand of this paper which we have heard tonight.

It seems to me that any noninflammatory lump, in a breast that is not lactating or recently involuting after lactation, should be subjected to microscopic examination. Such a procedure will leave little or no scarring and one can speak with authority. If only for the patient's peace of mind it should be done.

A woman came into my office the other day in whose niece, twenty years ago, I found a mammary lump. This I deemed benign and advised watchful waiting. The aunt told me that her niece was well and still had the lump. Today I feel sure that I would advise a biopsy in a similar situation.

DR. R. C. WEBB: This presentation by Dr. Campbell has been most interesting and particularly timely. Surgery of the breast has been considered as within the field of general surgeons and in recent years we have seen some general surgeons devoting their entire time to this type of surgery. Recently members of another specialty have established an American Board and competence in breast surgery is now broadly inter-

preted as within the scope of the holders of the certificates granted by this Board.

Early this past summer a woman, aged forty years, was referred to me because of a tumor of the left breast. For several years she had had an inverted nipple but without the presence of a tumor. She had consulted a physician and the question of simple amputation of the breast to relieve her anxiety as to the cause of the inverted nipple had been considered in the past. There had been some seepage from the breast but no bloody discharge. Recently the breast had been slightly painful. She again consulted her physician who this time found a tumor in the upper outer quadrant of the breast and about the size of a hickory nut. At operation I explored this tumor making a conservative radial incision. It was my intention to immediately perform the Halstead radical amputation if malignancy was found and if the tumor was benign to remove the breast to relieve the apprehension over the chronically inverted nipple. The tumor proved to be a blue dome cyst such as has been described tonight and a simple amputation of the breast was performed. Fortunately, however, I explored the breast after removal by slicing it serially and discovered a scirrhous carcinoma the size of a bean on the deep surface of the breast directly under the nipple. The radical breast amputation was then immediately performed and a certain amount of technical difficulty was encountered in order to stay outside of the previous operated field.

DR. MCCARTNEY: I feel that if all of our inaugural dissertations measure up to this one we will have a very good winter. I hope they will, and then we can't afford to miss any of them.

There is one point I would like to ask Dr. Campbell. In his paper he gave the average of these patients but I do not believe he gave the age limits, maximum and minimum.

We have felt for a long time that when cystic disease is present, such a breast is no more likely to develop a cancer than a breast which is not the site of cystic disease, believing that cystic disease is not a cause of cancer—the two are unrelated. The two are associated, every now and then, but not as cause and effect. Not infrequently when we see in a breast after radical operation we find that there are some cysts scattered around in it. It seems to me that maybe we might put it almost a little stronger—cystic disease is almost a normal condition in an older woman, they seem to be so frequent. Of course, the simple type of cystic disease does not give us any trouble at all; where we have simply the dilated ducts with an epithelial lining in a single layer we have no difficulty in making out the normal architecture of the breast, but when you begin to get these hyperplastic changes in the epithelial lining of the cysts, you cannot help but get some distur-

tion of the lobular arrangement and frequently when that hyperplasia is extreme it is very difficult to tell whether the lobular arrangement is preserved. When we can see that the lobular arrangement is preserved, we do not worry about it. When it appears that the lobular arrangement is no longer well preserved, then we begin to wonder about it. In the time I have been at the University I can see a definite change in Dr. Bell's attitude toward this condition. I think they bother him more now than they did a few years ago. He will call one malignant every once in a while that he would not have a few years ago.

We have felt that when there is a definite lump in a breast, really, regardless of the age of the woman, the only safe thing to do is to get the lump out and find out what it is. Only a few months ago I found a red hot carcinoma in a girl between 16 and 17. That is the only one we have under 20, and it is not always easy to find the tumor. One came in a day or two ago, grossly looking like a piece of fat about the size of an olive and appeared like a lipoma. We hunted around and found a nodule on one side—it wasn't over three or four mm. in diameter, and section showed a definite carcinoma. It was almost a microscopic affair.

DR. CAMPBELL: Dr LaVake mentioned being unwilling to observe a single tumor in the breast over any considerable period of time. I think the only safe rule to follow in these cases is to do immediate local excision.

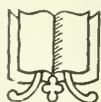
I am glad he mentioned lactating breasts. In these cases it seems safe to allow tumor masses an opportunity to subside. The newer ideas on the treatment of malignancy in the lactating breast indicate that surgery is so unsuccessful that it should not be undertaken. The use of interstitial radiation plus deep X-ray therapy is the advisable treatment.

In answer to Dr. McCartney's question about the age limits, I am sorry that I did not note them. If I remember rightly, the youngest was 22 and the oldest 67.

Surgeons are completely dependent upon the surgical pathologist and his ability to correctly interpret the quickly prepared section. As a surgeon I would not use a pathologist in the operating room whose ideas on this subject were unknown to me. I know that in the case of a borderline tumor if radical operation is advised by our pathologist or by a member of the Department of Pathology, it means that the doubt is too great to risk local excision only. Likewise, I know that the diagnosis of adenocystic disease, when made by these men, indicates a benign lesion and the breast can be preserved whereas less experienced pathologists might advise the complete operation.

The meeting adjourned,

H. BRIGHT DORNBLASER, *Secretary*.



THE  
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MINNEAPOLIS, MINN., DECEMBER 1, 1932

### STOP CRYING

Good morning, doctor. How did you enjoy Thanksgiving? That is, if you have recovered we mean? We just want to ask you if you didn't have a pretty good time. We believe you did, and should be able to musically answer like Maurice Chevalier in alternating staccato and legato "fine, love-lee, oh it was beauti-full." You had turkey, with cranberry sauce and pumpkin pie as usual, or "something just as good" didn't you?

If you were still "crying with bread under your arm" didn't that bountiful, if not lavish, dinner make you feel that it was unwarranted by the facts?

The material necessities of our people are not in danger of giving out. They are plentiful. We may have to learn the joy of helping others, even more than we have in the past, but, properly distributed, our supplies will suffice to go around so let's brush up and wear the old smile that everybody liked so well.

A. E. H.

### MONOTONOUS MEDIOCRITY

Let us turn from material things for a moment because we believe they are sufficient for all.

What effect is the economic depression having on the higher values of life?

Individuals, alas, are differently constituted, and so differently affected by adversity. Some lose morale and stamina, while in others necessity and the fighting instinct to survive and succeed bring out and develop qualities of leadership, and leadership is something this country

and this world needs so much, especially now.

We are living in a machine age, and it is being reflected in human beings. They are more alike than ever before, and naturally more mediocre. Large factories have standardized style. Unconscious muscular mimicry has standardized action; if one asks why this or that is being done, one learns, for no other reason at all than that "it's the thing being done." And every modern means of propaganda has standardized thought. The national hook-up influences all who come within sound of it's voice. We cook with a can-opener and we think by a radio dial.

We need more individuality; the kind that thinks for itself and is not afraid to be different. We need outstanding men in every walk of life including that of medicine. We need greater leadership, and perhaps the stress of present necessities will bring about such developments.

A. E. H.

### KETOGENIC DIET IN PYELITIS

In an editorial entitled "Antirachitic Milk" published in our "Nutrition Number" October first, we referred to specific instances where diet was the sole treatment required for certain disorders.

We omitted and now hasten to cite another interesting example that falls within this group.

It has been shown that a ketogenic diet may be used to clear up infections of the genito-urinary tract. The most striking benefits of this procedure are at once recognized in such relatively inaccessible cases as pyelitis, when such is partly due to mechanical obstruction as of pressure or a kink in the ureter, and where even surgery is obviously difficult and dangerous.

The method calls for a most scrupulous apportioning by actual weight of the proteids, carbohydrates and fats to be ingested each day, watching the diacetic acid until ketogenesis is obtained, but no procedure can be called meticulous that gives such results. By this diet alone, bacilluria

and pyogenic organisms have been shown to disappear in the course of one or two weeks by actual culture-negative tests. The advantages of achieving bacteriostasis through drugless dieting must appear to all.

A. E. H.

## NEWS ITEMS

A new surgeon has located at Hallock, Minn., Dr. F. E. Stocking having recently moved there from Calumet, Mich.

Dr. E. E. Bayse who was well known to the older residents of Ellendale, N. D., died last month at his residence in Los Angeles.

Dr. J. L. McLeod, formerly located at Bovey, is now located at Grand Rapids, Minn., where he will continue his general practice.

Mount Powell Medical Society, Anaconda, Montana, were recently hosts to the Butte society with a banquet and scientific program.

Dr. C. F. Cervenka, New Prague, Minn., is spending a few weeks at the University of Minnesota, taking a post graduate course in surgery.

Dr. O. J. R. Freed, who has been in active practice at Cokato, Minn., for the past 15 years, died at his home after an illness of a few weeks.

Dr. P. O. O'Leary, of the Mayo Clinic, Rochester, was the guest speaker at the November meeting of the Butte, Montana Medical Society.

Dr. Charles N. Spratt, Minneapolis, was the guest speaker at the November meeting of the Redwood-Brown Co., Minn. Medical Society held at New Ulm.

Dr. E. M. Halloran, who has been in active practice at St. Paul for the past twenty years, has moved to Duluth, where he has opened a hospital and sanitarium.

Dr. Hubert Miller, who has been in practice at Herried, S. D., for several years has decided to locate at Bison and will open his offices for general practice at once.

Dr. and Mrs. W. G. Sahr, Hutchinson, Minn., have recently returned from a four months' tour in Europe, Dr. Sahr attended medical clinics in Vienna, Berlin and Budapest.

Many of the hospitals in Minnesota and both Dakota's, have made marked reductions in rates in all departments, in order to give all patients the best of care at the lowest possible cost.

At the regular monthly meeting of the Grand

Forks Medical Society, the principal speaker of the evening was Dr. W. H. Long, of Fargo, his topic being "Treatment of Commoner Disease of the Heart."

Dr. L. Raymond Scherer, Minneapolis graduate of the University of Minnesota, 1928, who has a fellowship in medicine and also post graduate work in Philadelphia, has become associated with the Sivertsen Clinic, in charge of the department of internal medicine.

Dr. Sheridan G. Cobb, St. Paul, aged 69 years, founder of Cobb hospital, which merged with the present Midway hospital, and chief surgeon of the Minnesota Transfer Railway Co. for many years, died Nov. 18th at his home in St. Paul, following an illness of several years.

Dr. Charles H. Mayo of Rochester was elected president of the Minnesota Public Health association at its annual meeting in St. Paul. Dr. Mayo succeeds Dr. J. A. Myers, Minneapolis, who resigned after five years as president. Medical members of the association gave a dinner in Dr. Mayo's honor after the meeting.

Dr. Llewellyn Eliot, 80 years old, for 50 years a practicing physician in Washington, and known throughout the East as an authority on smallpox, died at Minneapolis last month. In 1926 he moved with his wife to Minneapolis, after retiring from practice, to be near his daughter, Mrs. F. E. Harrington, wife of the Minneapolis health commissioner.

Dr. Harold S. Diehl, University of Minnesota health service director, is keeping a dark secret, but it concerns that bane of winter—the common cold, which may be conquered at last. One hundred undergraduates, all victims of colds, have volunteered their services to Dr. Diehl as an experimental laboratory to determine the efficacy of a new pill which the physician said has cured colds for himself and several other staff doctors.

Half a century of service to mankind was observed at Northwestern Hospital, Minneapolis, in an informal service Tuesday November 22nd, this being their golden anniversary. While officers and directors of the institution acted as hosts, several hundred former patients, nurses and physicians strolled through inspecting the facilities of the large and modern institution, exchanging reminiscences of the days when the hospital was in its infancy. Mrs. Henry D. Thrall, is president of the board, Dr. D. Nordland, chief of staff, and Mr. Henry Brown, superintendent.

CLASSIFIED ADVERTISEMENTS

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One Ultra-Violet apparatus and portable Diathermy, Victor makes, for sale cheap. Both in good condition, having been used very little. Inquire Clinic Building, Yankton, S. D.

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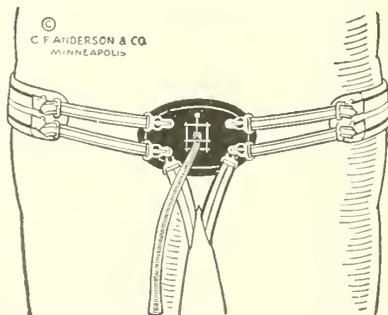
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## Phrenic Neurectomy—A Study of 75 Cases\*

J. G. LAMONT, M.D.

*Nopeming, Minn.*

**P**ATIENTS treated in the Nopeming Service in 1931 had a daily average of 292, of which 47 are in the two leading Duluth hospitals. Chest operations, excepting artificial pneumothorax are performed by Duluth surgeons. Patients considered in this report were treated at the Sanatorium before and after operation and were selected and later observed by the Nopeming Staff. In the majority of this series, pneumothorax had already failed from pleural adhesions. In about 25 per cent the neurectomy was preliminary to thorocoplasty and the immediate results were obscured.

*Age*—Oldest patient 57; Youngest patient 17; Average 30.2.

*Sex*—Thirty-one males; Forty-four females.

*Classification on Admission*—Non Tbc.—(Emphysema), total 1; Mod. Adv. A. 5; M. A. B. 3; M. A. C. 3, total 11; Far Adv. A. 37; F. A. B. 18; F. A. C. 8, total 63.

It will be noted that 85 per cent were in the far advanced class.

*Sputum*—Before neurectomy; Positive 70; Negative 5. After neurectomy; Positive 44; Negative 22. Doubtful 6; Too recent to report 3.

*Nutrition*—Before neurectomy; Good 34; Fair 24; Unfavorable 17. After neurectomy; Good 42; Fair 12; Improving 3; Unfavorable 2.

Nutritional results obscured 11.

Pneumothorax had been attempted before neurectomy in 37, of which 10 had been successful.

Thorocoplasty followed neurectomy in 9 cases.

Pneumothorax was later attempted on the homolateral lung in 4 cases, of which one was successful.

### *Contralateral Lung Before Neurectomy:*

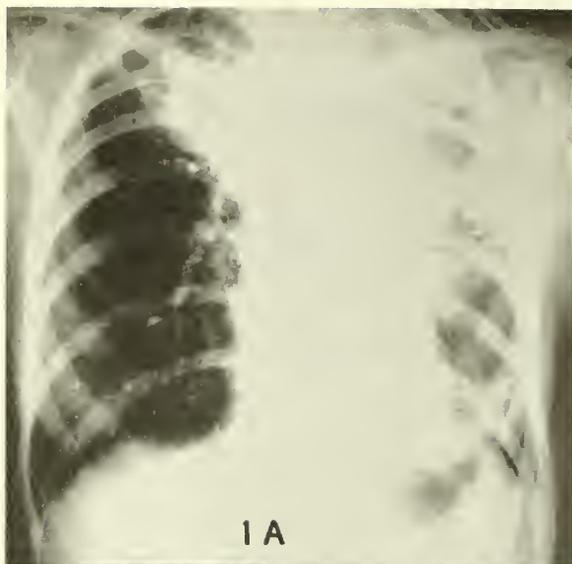
- a. No lesion apparent .....19 cases
- b. Light grade fibrosis .....21 cases
- c. Limited area of mottling .....17 cases
- d. Moderate fibrosis or obscured field ...8 cases
- e. Caseation with cavity formation .....5 cases

### *Contralateral Lung After Neurectomy:*

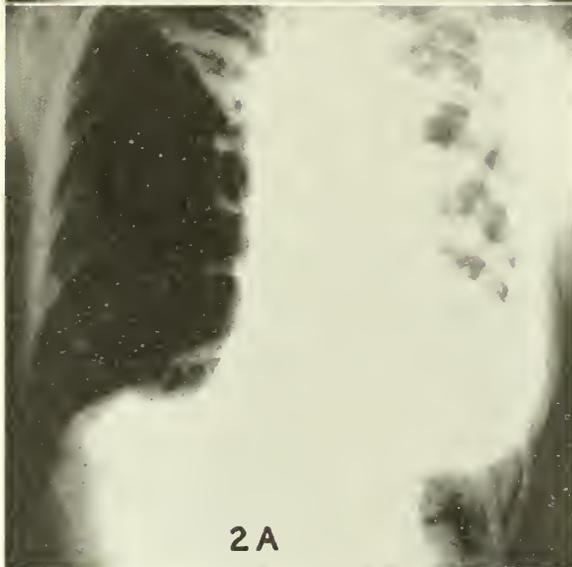
- a. Favorably influenced .....21 cases
- b. Marked clearing of densities .....7 cases
- c. Moderate clearing of densities .....6 cases
- d. Slight clearing of densities .....8 cases
- e. Disappearance of small ring body ....1 case
- f. Reduction of size of ring body .....2 cases
- g. No change noted in lung field .....18 cases

The results of neurectomy "per se" are difficult to evaluate because collapse therapy is at best an adjuvant to the usual Sanatorium rest plan. A change in the contralateral lung could be noted only in areas of mottling or cavitation, viz; in about one-third of the cases. Relaxation of a tense mediastinal wall might easily account in part for the disappearance of ring shadows or mottling in the contralateral lung

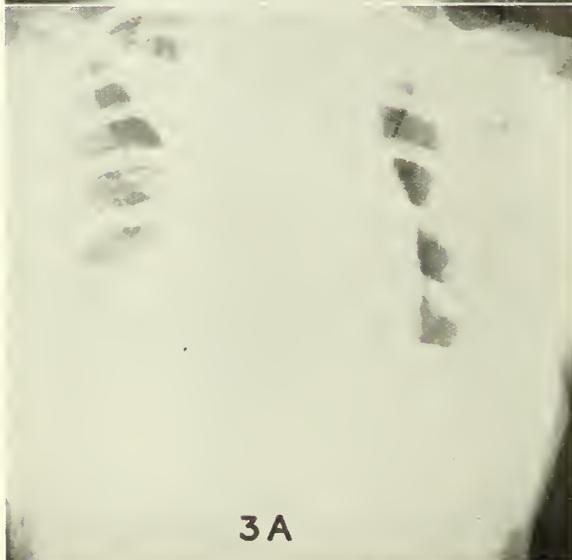
\*Read before the Interurban Academy of Medicine, May, 1931.



1A



2A



3A

field. At least in no instance was the result unfavorable.

*Homolateral Lung—Diaphragm Elevation:*

$\frac{1}{2}$ . Interspace	10 cases
1. Interspace	13 cases
$1\frac{1}{2}$ . Interspaces	10 cases
2. Interspaces	9 cases

*Homolateral Lung—Effect Upon Cavities:*

No reduction noted	7 cases	9.3%
10% reduction noted	3 cases	4%
45% reduction noted	7 cases	9.3%
50% reduction noted	4 cases	5.3%
75% reduction noted	3 cases	4%
80% reduction noted	1 case	1.3%
90% reduction noted	1 case	1.3%

Complete disappearance of cavities, 8 cases  
10.6 per cent.

Clearing of infiltration was noted in 34 or  
45 per cent.

Results were obscured by thorocoplasty or  
other surgery in 24 cases.

Seven died later of tuberculous complications.

Sixty-eight per cent of this series comprises  
cases in which no other form of collapse therapy,  
other than phrenic neurectomy was used. The  
results have been correspondingly gratifying.

LITERARY COMMENT

Sauerbruch, Stuert, Schelpelman and others  
reported favorable results about 20 years ago.  
Felix advised the more radical resection in 1922.  
The operation as phrenic crushing in minor  
lesions or as exairesis in major lesions has been  
adopted more commonly since 1925, as a single  
measure. O'Brien, Detroit, reports more than  
2,000 cases. Sanatoriums everywhere find a  
clearer definition of the use of this and other  
forms of collapse therapy. O'Brien believes that  
phrenic crushing should be used in minimal  
lesions that are not sufficiently active for pneumo-  
thorax. Exudative lesions that attempt to heal  
by cavitation should have exairesis prior to  
pneumothorax. Where neurectomy and pneumo-

A. E. CASE 2—PLATE 1A

Admitted March, 1931.

1. Extensive fibrocascous tuberculosis, left lung.
2. Cavity left upper lobe.
3. Fibrocascous lesion above right second rib.

A. E. CASE NO. 2—PLATE 2A

Exairesis, October, 1931.

Date of film, November, 1931.

Diaphragm raised two interspaces.

Reduction of cavity area.

Clearing of upper right.

A. E. CASE NO. 2—PLATE 3A

Pneumothorax, March, 1932, on neurectomized side.

Case still under treatment.

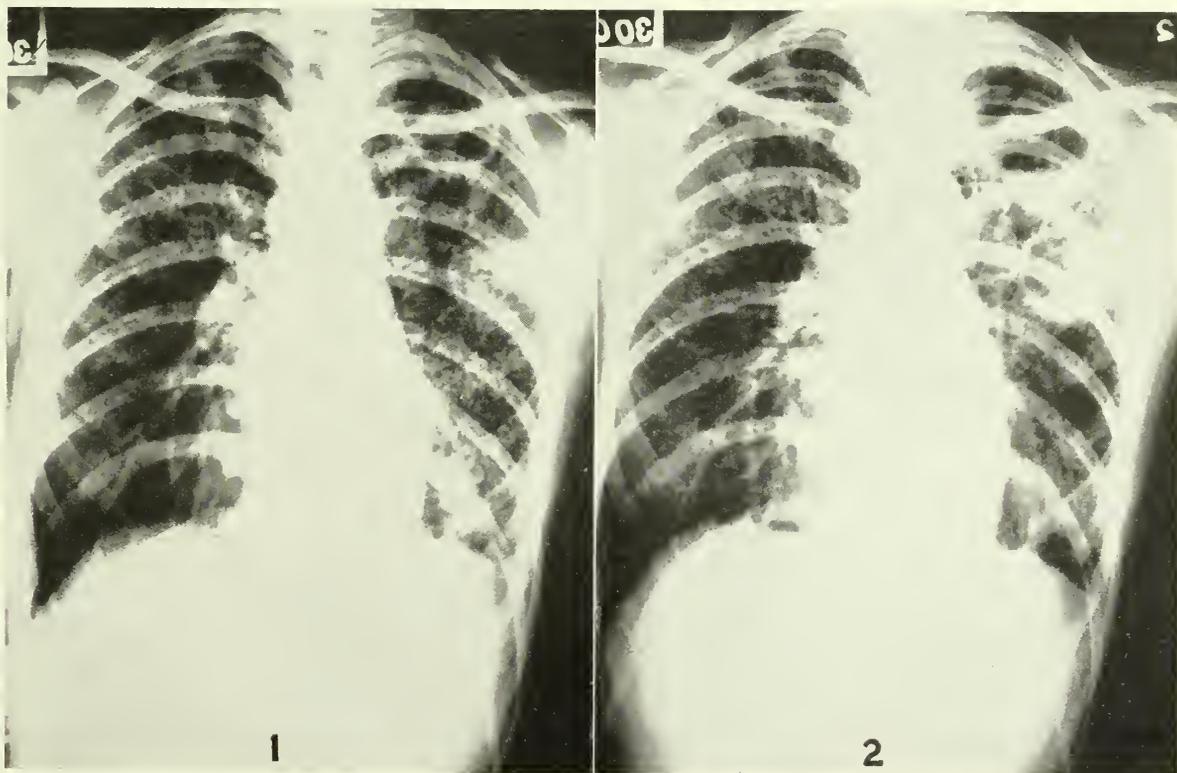
Much improved.

thorax appear to be equally indicated, he selects the nerve section. Pneumothorax is preferable in rapidly spreading soft lesions. Where there are thin walled cavities, phrenic crushing is preferable, the pneumothorax being used later if necessary. In phrenic crushing, the results are less uniform, because of the failure to get the accessory branch which usually unites with the main trunk below the site of the crushing operation and which is usually destroyed by exaeresis.

Kinsella (Glen Lake) advises against the routine use of phrenic neurectomy preliminary to thorocoplasty and he doubts its value as a test operation for contralateral lung; and that the measure will prevent aspiration of material from the upper to the lower lobe during or following thorocoplasty. In the experimental work of Mann and Lemon as much foreign material goes in to the neurectomized side as to the good side. Kinsella believes that the effect upon the contralateral is almost uniformly favorable. He has noted that patients with a preliminary exaeresis in thorocoplasty had more difficulty in getting rid of the sputum and had more dyspnoea. He believes that the non par-

alyzed pleural leaflet may prevent pendulum swing of the mediastinum. Headblom considers the phrenic section as a second thought in the general plan of lung rest.

In the Nopeming service, an attempt is made, in case selection, to judge the quality and extent of the lesion in the individual case. Phrenic crushing has not often been used for the reason that bed rest has been found satisfactory in most minor lesions. The advantage of phrenic neurectomy as a preliminary to pneumothorax "Where the lung is attempting to heal by cavitation" is doubted by some members of the staff. Cavities below the clavicle quite frequently have healed following the exaeresis, while apical cavities yield more rarely, probably due to the density of their walls. It has been a gratification to note cavity cases in which pneumothorax is impossible that have healed with a few weeks of bed rest following exaeresis. Many chronic fibroid types with positive sputum, become sputumless and negative within a few months. When there is much toxemia, a haemorrhagic tendency, or a rapidly spreading exudative lesion



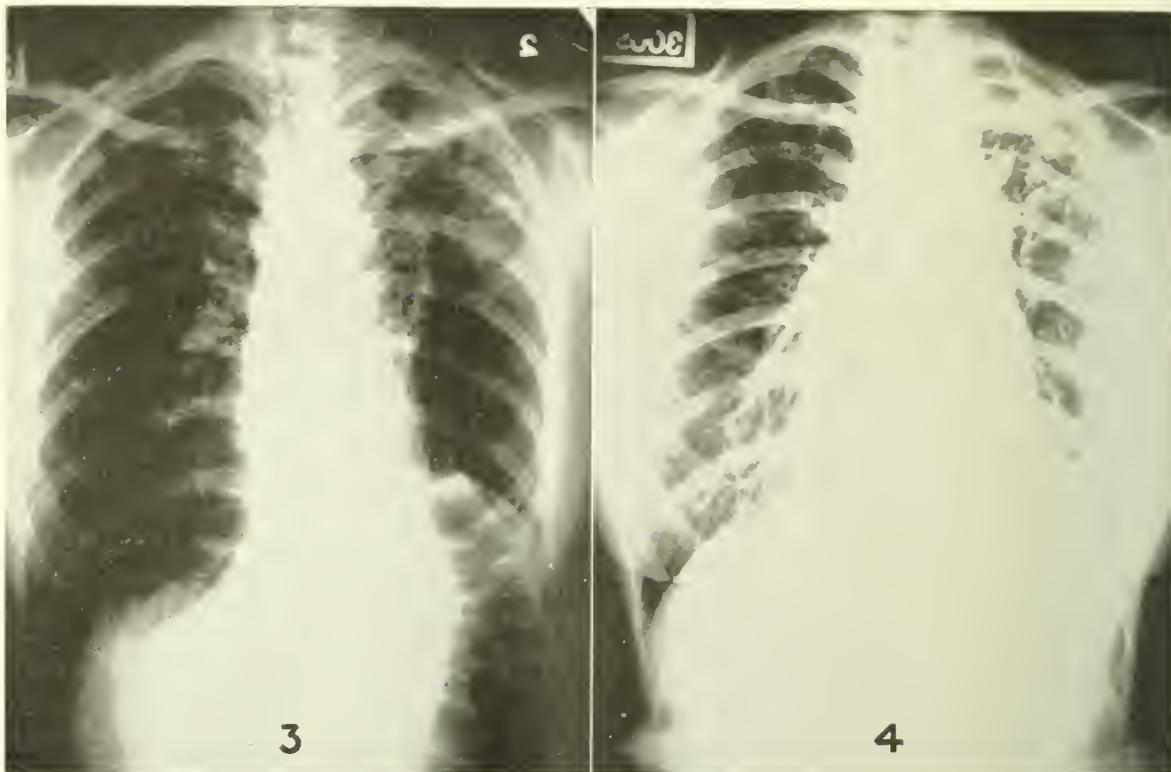
F. E. CASE NO. 1—PLATE 1

Admitted May, 1930.

1. Bilateral fibrocaceous tuberculosis.
2. Large cavity, left upper.
3. Caseated area, left mid lung.
4. Generalized miliary process, right and left lung fields.

F. E. CASE NO. 1—PLATE 2

1. After 5 months complete bed rest, some clearing in right lung field.
2. Extension of apical cavity.
3. New ring body, left mid lung.



F. E. CASE NO. 1—PLATE 3

1. Phrenic neurectomy, September, 1930. Date of film, April, 1931.
2. Left diaphragm raised  $1\frac{1}{2}$  interspaces.
3. Disappearance of ring body at left mid lung.
4. Contraction of apical cavity.
5. Marked clearing, right lung field and left lower lobe.

F. E. CASE NO. 1—PLATE 4

- Date of film, April, 1932.  
 At date of discharge sputum negative, 1 year.  
 Small apical cavity remains.  
 Light fibrosis, bilateral.

the indication is obvious for the operation, combined with other methods.

We have been impressed with the improved condition of the contralateral lung in our small series. We believe that the effect upon advanced

lesions of the homolateral lung in cases where pneumothorax is unsuccessful is such that thorocoplasty may sometimes be avoided by allowing a sufficient interval to elapse following the exairesis.

## Life Insurance and the Medical Profession\*

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**I**N OUR complicated modern civilization, the sciences and professions have become very closely knit with industrial development, and there is every evidence that this tendency will grow rather than recede. From the point of view of pure science or from the professional viewpoint, this has occasioned many expressions of regret; science, law, medicine are being "prostituted to industry," are "becoming commercialized."

\*Read before the North Dakota State Medical Association, June 1, 1932.

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However, there is another viewpoint. While pure science and the professions have lost much of their privileged insularity, yet it may be possible that they have at the same time broadened in outlook and service. Certainly the benefits of science and the service of law and medicine are enjoyed by the public to a wider and more equitable degree than ever before in history, and it may well be that this constitutes a fair criterion of true progress.

In medical practice radical changes have come

within the present century and these tendencies seem to be spreading. The last 50 years have brought with the revolutionary development of the scientific side of medicine equally violent changes in its administrative side. This period has seen the employment of public health officials, physicians, laboratory and research workers by government, state, and municipality, by medical schools, by privately supported research laboratories, dispensaries, clinics, by medical clinics, and by many industries. The number of salaried physicians in this country a half century ago was negligible; today they number about 15,000.

The adjustments necessary in a period of such radical changes have brought many individual hardships as well as general problems which will require the studious, restrained efforts of all groups concerned for their proper solution.

Every move that can be made to raise the standard of medical practice, to protect the field, and to enlarge the opportunities of the individual practitioner, and at the same time extend the privileges and benefits of modern scientific and medical practice to the largest possible scope of usefulness and service, must be the united aim of every physician and every public spirited citizen. No greater calamity could happen in this country than that the opportunity for the practice of the most humanitarian and altruistic of all fields of human endeavor should be jeopardized or restricted, and at the same time the medical service needs of all classes of both the rural and urban population must be adequately met.

I venture the assertion that no industry has contributed more to the individual practitioner nor to the scientific side of clinical medicine than has life insurance. It is a pleasure to outline briefly to a group of physicians some of the problems to which both clinical and insurance medicine have contributed, and also to suggest that the financial relationship which exists between medicine and life insurance, though already considerable, is not as great as it should be in order to bring to the profession the service which life insurance can and should render.

The medical profession has been intimately related to the life insurance industry almost from its inception, at first in a purely advisory capacity, but by 1850 the issuance of life insurance policies was universally conditioned both on a medical examination and on a home office medical approval.

There are in this country two national medical societies which hold regular annual meetings devoted to the study and development of this specialty in medical practice. While it is based in

great part on clinical medicine, life insurance medicine is much more concerned relatively with biometry, statistics and prognosis, and along these lines has made great advances beyond the stage reached by clinical medicine. It might be well for us physicians to keep in mind a saying reputed to Hippocrates, that, what the patient was most interested in was prognosis.

A few of the scientific interrelationships between clinical and insurance medicine are:

1. In the field of public health. Physicians as a whole do not always appreciate the tremendous influence of the health activities of insurance companies through their agency force and 68,000,000 policyholders; their health literature; their visiting nurses; their periodic physical examinations; their support of private and public health activities; their sanatoria for employees; their health service to policyholders, employees, and the public. The periodic health examination was at first almost exclusively promoted by insurance companies and a few other industries, and has only recently and very partially been taken up by the medical profession as a whole.

2. Educating the public in an appreciation of medical standards and adequate medical training. Insurance companies are financially interested to a major degree in obtaining the services of competent well-trained physicians, having in mind grade of school, training, hospital service, professional affiliations, and personal character. This group therefore sets a high standard of professional service which agents, policyholders, and the public recognize.

3. The above standard means not only original education and equipment, but the maintenance of an advanced position in medical practice, and insurance companies have been very helpful along several lines in educating and training examiners; for example, it was the requirement of blood pressures by insurance companies that so quickly spread the use of the sphygmomanometer throughout the profession.

4. I shall mention only one more contribution of insurance medicine to clinical medicine, but I think it is the most important of all, that is, the statistical studies and the conclusions drawn therefrom as to mortality trends and prognosis in disease, which have been developed by insurance companies and made available to the profession, but which I am sorry to say are not being adequately taken advantage of. Many of the most serious mistakes of clinical medicine in diagnosis, treatment, and prognosis have been made throughout the history of the profession on account of inadequate data unscientifically analyzed.

There is much uninformed talk nowadays about the improvement in life expectancy, as a result of better living conditions and improved medical and surgical attention. Unfortunately, this optimistic attitude is not borne out by statistical evidence. It is true that a baby born today has a life expectancy 18 years greater than if born 50 years ago, but this does not mean that any of us has had a single year added to our present life expectancy. The improvement is entirely in infant mortality. A man of 25 or over today has no increased life expectancy—in fact, if you are over 30 years of age you have a lessened chance of living to 80 than if you had lived 50 or 100 years ago, or even 150 years ago, and had been a neighbor to Washington or Jefferson, leading the leisurely life of a Virginia gentleman, without telephone, telegraph, stock exchanges, electric lights, motor car, or aeroplane, all speeding up the tempo of modern American life and adding to its strain and to the incidence of mental disease, heart, arterial, and kidney disease. It is an interesting commentary on the change in American life during the past 150 years, that the average longevity of Presidents of the United States before the Civil War was 12 years longer than the longevity of the Presidents after the Civil War.

It is estimated that life insurance companies pay to physicians directly in fees about \$20,000,000 annually. While this is a large sum and should form the financial basis of an understanding and friendly relationship between the two groups, it should express, however, but a very small fraction of the financial benefit which physicians derive from the life insurance industry. The major benefit, and one that should be many times as great as it is, should be the use of life insurance as an investment by the medical profession, and I believe it could be most profitably made the one and exclusive investment for physicians, for the following, which seem to me to be conclusive, arguments:

1. Physicians are scientific, professional men, not as a rule qualified by either taste or training for financial ventures. A man ordinarily would not go into medicine if his major interest were finance or money making. His interests are scientific and humanitarian—neither consonant with financial shrewdness. A common tragedy in medical practice is for competent, hardworking, devoted practitioners, through poor business methods and unwise investments, to end their days in comparative want instead of in ease and competency, in travel, reading, research, and culture, which their tastes dictate, and their services

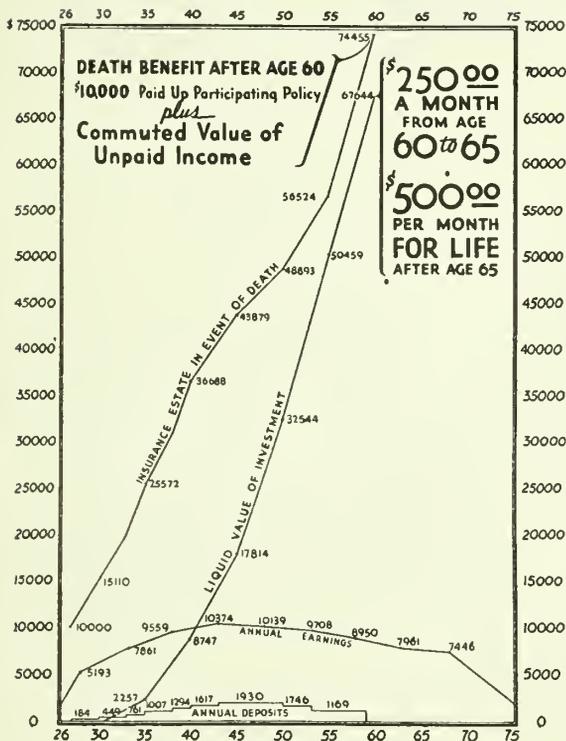
have justified. If the shrewdest business men, banks and investment trusts, have suffered the stupendous losses which they have during the past three years, how possibly can a busy scientist and earnest practitioner expect to excel them? He doesn't. It is well known that doctors have bought freely and most unwisely during the past decade, not only from "sucker" listings of fraudulent stocks, but from what should have been reputable representations from bond houses and banks, but which have proved otherwise.

2. A physician's life is a busy one, with a large element of serious nervous strain. To have the lives and happiness of his patients and friends in his keeping is all the burden a man can endure. To have, in addition, to worry over the choice of investments, the periodic fluctuation of market values, the loss of hard earned savings, the fear of unprotected dependents, or uncertain comfort in old age, is an unnecessary and unjustifiable addition to normal professional strain, which in many cases goes beyond the breaking point. A medical man is unfair to himself, his future, his patients, his family, if he assumes, in addition to the burden of his own career, the added career of banker or trust officer.

3. Unfortunately, the professional man cannot today depend on some bond houses and some of the other financial institutions to sell him the type of security he should buy. Hundreds of millions of worthless stocks and bonds have been loaded off during the past twenty years on inexperienced customers, who now have but a small fraction, or nothing, of their life savings.

4. Life insurance seems as though it had been devised for the physician above everyone else. It completely solves his financial problem, provides for his family, conserves his savings, and absolutely safeguards his old age. I have a medical friend who has, in pursuance of a definite lifelong policy, never put a dollar in any other investment than life insurance. Today when all his friends, bravely or gloomily according to their temperament, are discussing their losses, he has every dollar, not only intact, but substantially augmented by annual accumulations. He cannot see, nor can I for that matter, any other investment possibility for the physician at all comparable to life insurance, from the point of view of peace of mind, health, family protection, and personal affluence. The following chart tells its story. This chart shows an insurance program for the average American physician. The income is taken from the figures of the American Medical Association. The chart starts with the second year of practice, but ordinarily a medical student could very prop-

A DOCTOR'S  
INVESTMENT PROGRAM



and has an estate of \$48,800; from 52 to 54 he saves \$1,700 a year and has an estate of \$56,500; from 55 to 59 he saves \$1,100 a year and has an estate of \$74,000. After age 59 no more deposits are required, and the insured begins to receive a monthly income of \$250 at age 60, which is increased to \$500 a month at age 65. If his wife is living when he reaches 60 he can elect to substitute \$211.45 for himself and wife throughout both their lifetimes instead of \$250 for himself alone, and at age 65, \$435.22 a month to himself and wife throughout both their lifetimes instead of \$500 for himself alone. This program is planned for a physician who earns a maximum at the height of his career of \$10,000 a year, and it allows a major part of this income to be spent for the needs of a growing family. In the case of a larger income or smaller living expenses, the value of the estate and the income after age 60 can be proportionately increased to any larger amount desired.

While the program outlined is designed for the doctor who is just beginning his medical career, life insurance also forms an attractive medium of investment for the professional man who adopts it later in life. The ease with which one can obtain financial independence for his retiring years by saving systematically can best be illustrated by the development of other programs similar to the one previously discussed.

The physician starting a life insurance program at age 35 can assure himself an income of \$250 a month from age 60 to age 65 and \$500 a month for life after age 65. These results will be provided by annual savings of approximately \$900 a year from age 35 to age 37, about \$1,350 at ages 38 and 39, slightly less than \$1,750 from age 40 to age 59, and approximately \$800 a year thereafter to age 64.

The same retirement fund can be built up by starting the plan at age 40 with annual savings of approximately \$1,300, increasing at age 42 to about \$2,100; at age 45 to about \$2,370, and decreasing the annual savings from age 60 to age 64 to approximately \$1,100.

If the beginning of the plan were deferred to age 45, the same retirement fund could be obtained by starting with an annual saving of approximately \$1,900, increasing at age 48 to approximately \$3,400, and reducing from age 60 to age 64 to about \$1,500.

Many professional men because of their unfortunate selection of investments in the past are unable to start a life insurance saving plan at the early ages illustrated. A great number of these men have found on investigation that

erly take up to \$4,000 of insurance during his medical course and internship to protect in part the investment made in his education, and then the amount saved annually should be increased during the comparatively short period of his growing and maximum earnings. Few young physicians appreciate how short a period of adequate earnings lies ahead of them, but carefully compiled statistics show that after 45 a physician's earnings begin to fall off gradually, and this does not take into consideration the many who drop out of practice from death, ill health, and failure to earn a livelihood. Physicians during the first decade after entry into medical school are very subject to tuberculosis, and after that period become increasingly subject to cardiovascular-renal disease. For a small extra premium, in the event of total and permanent disability, all subsequent premiums on a life insurance contract are paid by the company, and for a small additional payment a substantial income is paid monthly for life. No other investment combines these features so essential to financial safety for the physician.

On this program, by age 30 our young physician is saving in life insurance about \$450 a year and has created an estate of \$15,000; at age 40 he is saving \$1,600 a year and has an estate of \$36,000; from 43 to 51 he is saving \$1,900 a year

life insurance also offers for them the comfort of an assured income on retirement at a surprisingly low annual savings.

These programs provide an income of \$250 a month beginning at age 60 and increasing to \$500 a month at age 65, and the savings are shown on an annual plan. Life insurance companies are glad to arrange the method of payment to conform with the income of the investor, and the savings may be deposited either on an annual, semi-annual, quarterly, or monthly basis.

Life insurance companies have many different types of contracts and are pleased to recommend the particular plan that will be best fitted to the individual's needs. For instance, if a monthly income is not desired to begin at age 60, a plan may be provided for beginning the income at age 65. If this plan were started at age 40 it would

require approximately \$130 a month to provide a monthly income of \$500 beginning at age 65. If this plan were started at age 45 it would require a monthly savings of approximately \$190 to age 65.

While these illustrations do not make provision for insurance now owned, any well-informed agent of a progressive legal reserve company is in a position to develop a plan which will make the present policies a part of this program.

From my own experience and that of my professional friends, I feel justified in urging every medical student and physician to lay out an investment life insurance program for himself, and by adhering to it strictly throughout his active career, guarantee to his family adequate protection, and to himself, ease, comfort, and cultured leisure in his later years.

## Wall Traction in the Reduction of Fractures\*

A New, Simple and Practical Method Applicable in General Practice

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THE FIRST and most important step in the treatment of any fracture in which dislocated bone fragments are present is the replacement of those fragments into positions as near to the normal as possible. Retention and fixation of the fragments cannot be done successfully until satisfactory reduction is accomplished. Most of the difficulties, complications, unsatisfactory results and more or less well-founded complaints about our lack of skill in fracture treatments are due to incomplete and poor reduction at the time of the first observation and treatment.

There are no splints devised and no fracture beds invented that are in themselves capable of turning a poorly reduced fracture of an arm or a leg into results that will give one hundred per cent satisfaction to the owner of the arm or the leg. Each and sundry instrument and apparatus employed in the treatment of fractures are useful only in proportion to the skill and judgment exercised by those who apply the instrument or apparatus.

Before attempting to reduce a fracture it is essential that the medical attendant has a clear mental picture of the normal anatomy involved and also of the abnormal conditions and relations

brought about by the injury. With rare exceptions this mental picture is not reliable unless it has been obtained in conjunction with a study of properly taken x-ray films.

The most common displacement in fractures of the long bones is an overriding of the fragments. This is produced and maintained by the contracting muscles covering the damaged bone. Muscle spasm is always nature's method of protecting injured parts and of preventing injuries from becoming still greater.

Extravasation of blood and cellular infiltration of the surrounding soft parts begin immediately after a fracture has taken place. If the overriding is allowed to continue, i. e., if reduction is not accomplished very soon after the injury, the muscles will become stiffened and set in their contracted positions and they may be unable to relax and assume their original length even when the patient is under a general anesthetic. This makes reduction more and more difficult the longer it is deferred after the accident. If the displacement is pronounced and several days have elapsed, open operation will often become necessary in cases where the reduction could have been made easily on the day of the accident. The main problem in reducing fractures of long bones, therefore, consists in overcoming the spastic contraction and shortening of the long muscles.

\*Read at the Forty-fifth Annual Meeting of the North Dakota State Medical Association, in Grand Forks, N. D., June 2, 1932.

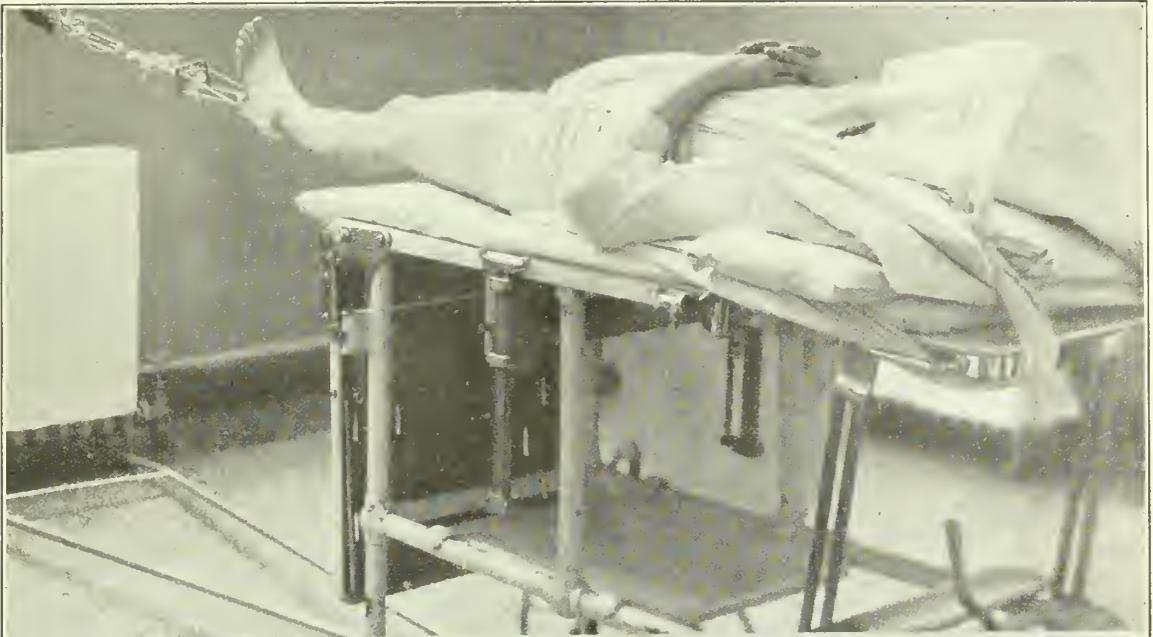


FIG. 1

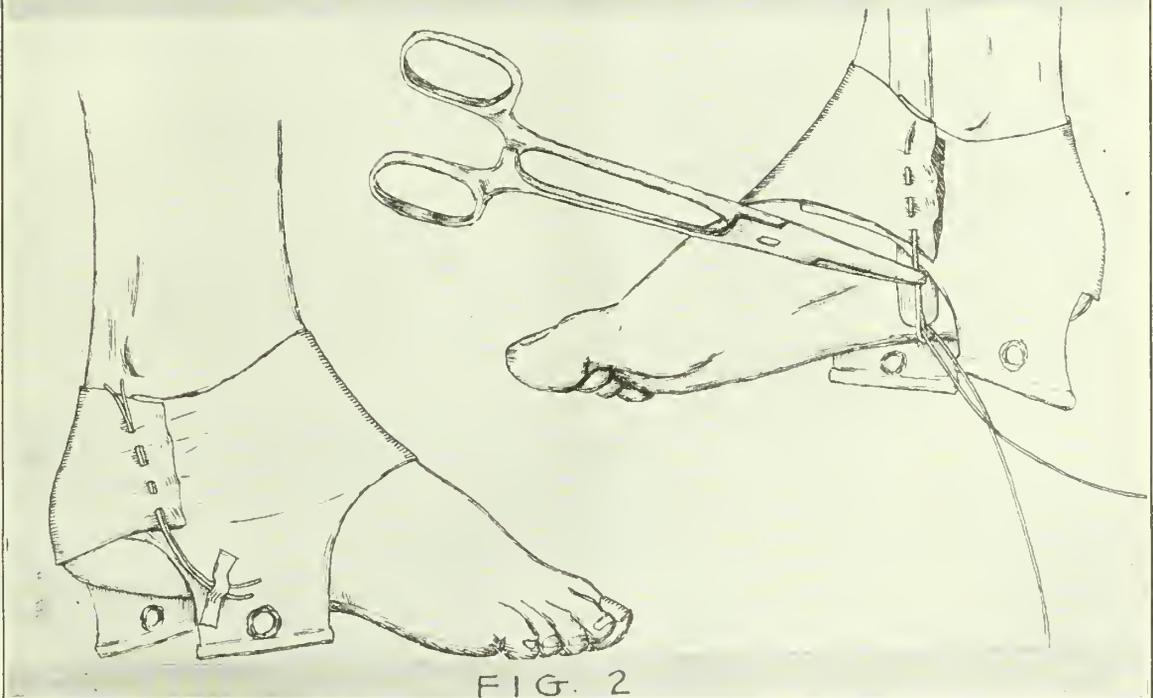


FIG. 2

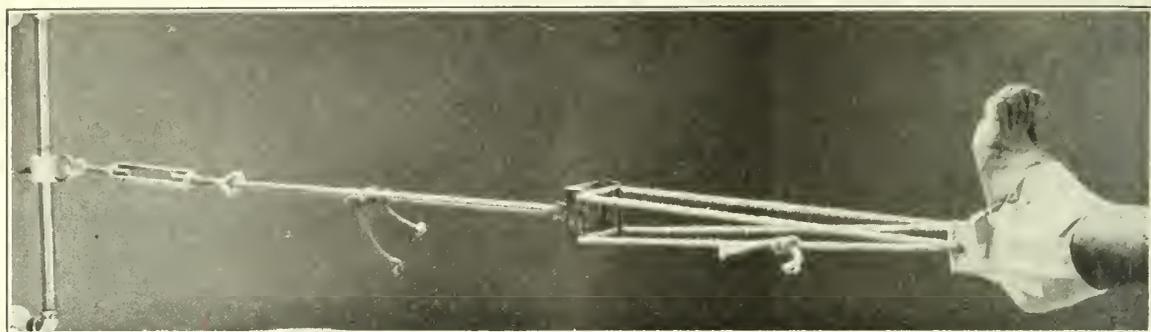
Fig. 1. Wall traction on canvas anklet, iron brace against operating table, sheet from perineum over head of table for counteraction, turnbuckle regulating traction, spring scale showing amount of traction. Malleolus is clear. A demonstration on normal man without fracture, 70 lbs. registering when taking picture. Moderate pressure pain felt over instep, patient said. "Could stand much more pull without anesthetic."

Fig. 2. Schematic drawing of 2-piece canvas anklet, showing insertion of basting wires. Needle removed with wire cutter. Adhesive strip holds wires in place during manipulations of reduction and fixation. The line of traction here shown is a little too far forward on external surface of foot.

It was formerly the practice among doctors as well as among various types and grades of lay "bone setters" to reduce the overriding, or at least to attempt it, by hand power alone. On the arrival of the x-ray many orthodox methods

of diagnosis and treatment hitherto considered quite satisfactory received stunning blows, and many were forever excommunicated from all Æsculapian temples and wayside chapels.

Outstanding in this therapeutic revolution,



Showing apparatus in practical use. Simple fracture of tibia and fibula.

originated by the x-ray and completed by mechanical ingenuity, were the radical changes brought about in the management of fractures. In the course of time and experience it was shown that several types of fractures were reduced safest, quickest and best if the patient were fastened firmly to a table supplied with an extension apparatus for the production of sufficient traction to overcome the muscular spasms. It was necessary, also, that the traction apparatus be combined with a suitable mechanism for countertraction.

The so-called Hawley table may, perhaps, be named as the standard apparatus of this kind. So far as the writer knows, it still holds the foremost place for all-around usefulness. But it has the great drawback of being so expensive that only the large hospitals and clinics, or those in comfortable economic circumstances, have been able to own an apparatus of this kind.

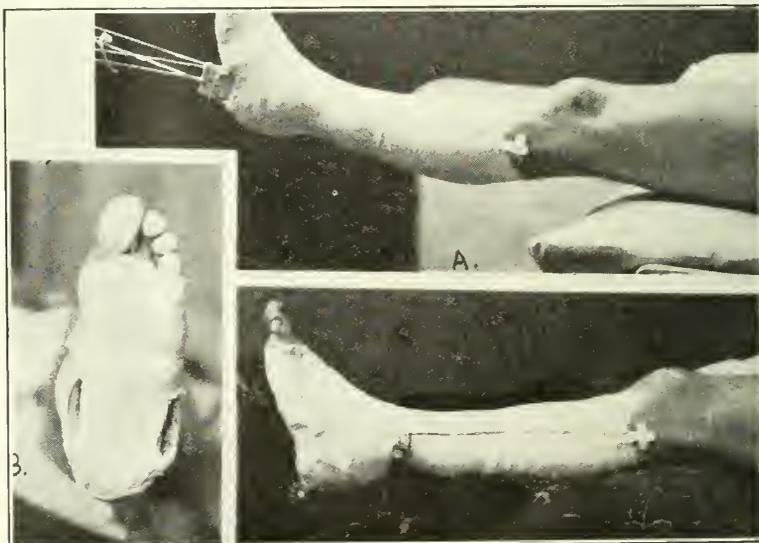
Several smaller and cheaper contrivances for the same purpose are in the market. They are designed to be placed on an ordinary operating table and to turn this into a temporary fracture table. Satisfactory traction and countertraction are usually obtained by their use in less complicated and serious cases, but their frail construction is always a matter of concern under more difficult conditions.

However, there are some objections other than their cost to all these fracture table methods, especially when traction is made on the lower extremity. Serious injuries to the urethra have been reported, due to the pressure produced by the hard unyielding metallic peg or plate which is forced against the perineum by the countertraction against this part of the anatomy. Another difficult problem not only with all types

of fracture tables, but with all the commonly used traction methods is the necessity in many cases of applying a plaster cast around the ankle and foot without releasing the steady traction and without danger of leaving a constricting bandage under the cast.

Reduction of fractures by means of transfexion pins or ice tongs is practiced and advocated by many surgeons. It is not a method to be recommended for the general practitioner of medicine, nor for the "occasional" surgeon, and it will not be discussed further before this assembly of medical men, the majority of whom, we have reason to believe, is made up of general practitioners.

Fracture tables, pin traction, many types of special bone instruments and expert knowledge in their uses all belong on the list of requirements for every modern, well equipped and financially independent hospital. But, all fractures are not treated in such hospitals. Very many fractures are of necessity treated in small in-



(A) Cast applied (without padding). Note long corset stay against skin under cast. (B) Basting wires removed and the two halves of ankle withdrawn. (C) Cutting cast over protecting corset stay.

stitutions where strict economy must be combined with scientific skill, regardless of the desperate nature of the emergency. Moreover, many fractures are treated every day of the year all over the world where no hospital conveniences whatsoever are available. Many a doctor is obliged to treat fractures under conditions where he has no support other than his own skill and versatility to aid and abet him in the numerous trying situations that may arise. It is for the benefit of these handicapped hospitals, physicians and surgeons that this article and the demonstration that will follow have been prepared. They are based on the observations and experiences gained during the past two years from a practical investigation of the problems involved.

The origin of these studies may prove of interest and it will, therefore, be told somewhat in detail.

Sometime ago it became my duty to treat a compound fracture of the leg under conditions where neither a fracture table, suitable bone instruments, nor a sufficient number of assistants were at hand. It was a serious injury. The splintered shaft of the tibia, escaping from a large wound, rested on the skin over the ankle. The wound was bleeding profusely and the loss of blood was approaching the limits of safety. Prompt and active treatment was imperative. The patient, resting on an ordinary small dressing room table, was a large and muscular man. A general anesthetic was given and two clove hitches were made from bandages and placed around the ankle. The ends of the bandages were tied around the shoulders of a nurse for the purpose of producing traction. But the nurse was of the light weight type and in spite of all her efforts she could not overcome the overriding of the fractured tibia. It was evident that more traction must be obtained and obtained quickly. To push the anesthetic to a more profound degree was undesirable in view of the patient's condition.

The patient was lying on the table in a direct line between a radiator at one end of the room and a steampipe at the other. These stationary objects gave rise to the idea of tying the bandages from the foot around the steampipe and securing the head of the table to the radiator with another bandage. A sheet, rolled up diagonally into a heavy rope, was pulled tightly against the patient's perineum and the ends of the sheet were tied to the head of the table. This fixed the patient to the table and established a reliable countertraction. Traction was now ac-

complished by the nurse who was instructed to place a stick of wood between the two bandages running from the foot to the steampipe and to twist the bandages by turning the stick over and over. It was surprising to see how readily the twisting and the shortening of the bandages produced a traction of sufficient amount to reduce the overriding, control the bleeding, and make possible a satisfactory plaster of Paris fixation.

The experience just related led to a series of experiments with this form of skeletal traction for the reduction of fractures. The object in view was to improve and refine this simple method and, if possible, to make it practical for more extensive use. It was not needed particularly in our hospitals, but it was evident that it might be made useful in many places where all the modern surgical conveniences were not available..

The result of our experience in these efforts has been the development and satisfactory use of the following method in a number of fractures of the lower extremity, and a few of the upper.

An iron hook is fastened firmly into the wall opposite the foot of the operating table at a height corresponding with that of the table. A firm brace is placed against the table to prevent it from sliding on the floor. The patient is strapped to the table in the ordinary manner, and, in addition, a canvas belt is adjusted against the perineum and buckled to the head of the table. A small crescent shaped pneumatic cushion, made from a segment of an automobile inner tube, is sewed into a pocket under the canvas belt in order to make an even distribution of the pressure produced by the countertraction on the perineum. This is a refinement of the countertraction and an improvement over the rolled up sheet already described, but it is by no means essential for the successful use of the method.

An important and necessary part of the new traction method under discussion is an anklet made from light canvas or similar strong thin material. It is made in two halves, each piece being roughly T-shaped with one arm of the T about twice as long as the other. The width and length of the arms should vary with the size of the foot. The width of each half, when the anklet is intended for an average adult, should be about nine and one-half inches and the depth from the upper margin to the lowest point of the T, about eight or ten inches. A hole, one-half inch in diameter, is made near

the bottom of the T. This hole is sutured all around with a button hole stitch to prevent it from fraying and tearing. A short piece of stout wire, or nail, is sewed into the base of the T for additional firmness when traction is applied. The two halves of the anklet are adjusted snugly to each side of the ankle and foot in such a manner that the flaps with the holes are in exact line with the normal long axis of the fractured bone. The line of traction should be about one-half inch behind the malleolus on each side. If the line of traction falls in front of the malleoli, the front of the foot will be pulled down too far and it will not be at a right angle with the leg when a cast is applied over the anklet. The two halves of the anklet are now basted together with a piece of piano wire on a long straight needle. The steel wire used for tonsil snares has been found very satisfactory. Correct adjustments may be maintained by clamping the two parts of the anklet together with artery forceps until the basting wires have been introduced. The necessary four or five stitches will be made more easily if the needle is bent a little at the tip. After the posterior suture line is determined, it is best to clamp the halves together at this point and remove the anklet from the foot. The posterior basting wire is then more easily introduced. The anterior suture must be introduced while the anklet is applied and adjusted around the ankle and while the two flaps are held in place with artery forceps. In order to protect the skin from the needle point while this is done, a short corset stay, or other thin spatula, should be placed under the suture line. After the wires are pulled into place the needles are removed with a wire cutter and the distal ends of the wires are fastened to the canvas with adhesive plaster.

Connection from the anklet to the hook in the wall may be made by a piece of rope the size of an ordinary clothesline. The ends of the rope are tied into the holes in the anklet, and the center of the rope placed over the hook. Traction can then be produced by simply twisting the rope. Care must be taken to prevent the foot from rotating out of line. This is best done by fixing the small block of wood between the ropes about eight or ten inches from the foot. However, the smoothest and most dependable traction is accomplished by the introduction of a turnbuckle between the foot and the wall. The traction from the wall is made by a slow turning of the turnbuckle. As soon as the muscle contraction is overcome, a sensation of crepitus will be imparted to the palpating

and co-operating surgeon's fingers as the ends of the fractured bone slip into their proper places.

When the reduction is satisfactory, and proved to be so by a movable X-ray apparatus whenever possible, a plaster cast may be applied over the knee, leg, ankle and foot. Before applying the cast a piece of paraffin paper is laid over the canvas to prevent it from becoming adherent to the cast. Vaseline, or melted paraffin, applied over the anklet will serve the same purpose, but neither is as satisfactory as paraffin paper. The plaster may be applied around the foot including the heel and sole. In applying the plaster bandages it is important to prevent them from contacting with the projecting flaps which are now tensely stretched by the ropes on each side. Complete freedom of the flaps is necessary in order to facilitate their later removal through their respective openings left in the cast.

By this simple method a steady traction of seventy to eighty pounds has been applied experimentally on normal individuals who were not anesthetized, without causing undue distress, either to the perineum or to the foot. Under anesthesia a greater force may safely be applied. A number of fractures of different types, including several open operations, have been treated successfully by this almost ridiculously simple procedure.

One of the chief advantages that may be claimed for the method, besides its homemade and inexpensive features, is the fact that the two halves of the anklet are easily removed after a plaster cast has been applied and set around the *leg, ankle* and *foot* under continuous, steady and efficient traction. The removal of the anklet is done by simply pulling out the wires on each side and withdrawing each piece of canvas through its opening in the cast.

The method also has several other commendable features. The material used for traction is so thin that the cast does not become too loose after the canvas anklet is withdrawn, which is often the case when thicker materials are used for the same purpose. In several oblique fractures of the tibia it has been possible to apply the cast firmly enough against the instep and the knee joint to maintain satisfactory fixation and apposition of the fragments. Since the pressure producing anklet is removed after the plaster is set, there will be no harmful constriction remaining about the ankle. Unless swelling is pronounced, it is possible to apply the anklet entirely below the malleoli, thus giving access to open operation as far as the ends of the bones, if necessary. All the materials used

may be sterilized, obviating special precautions against infection. The reduction can be made very easily under fluoroscopic control with a portable roentgen apparatus, since the fractured limb is entirely free on all sides. The pneumatic pressure on the perineum is, undoubtedly, the safest form of countertraction.

Last, but by no means least, it is a *one man technique*. By this method a lone surgeon or physician can treat (and if necessary, operate on) many fractures where otherwise he would be seriously handicapped without the help of one or more professional assistants.

Although this procedure has its greatest field of usefulness in the reduction of fractures of the leg,

it has been found very helpful in other fractures as well. It has not been tried out sufficiently in fractures of the femur to warrant any definite conclusions at this time. However, in certain fractures of the arm and forearm its application has proved very serviceable. In these cases the countertraction, of course, is made against the axilla and thorax and the canvas "anklet" is turned into a "wristlet."

It is with much pleasure and with a solemn conviction that wall traction offers the simplest, most satisfactory and least complicated and expensive method of treating many fractures of the long bones that this contribution is presented to the members of our medical association.

## Toxic Neuronitis in Pregnancy\*

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THE occurrence of toxic neuronitis during pregnancy is lightly dismissed in the modern text books dealing with obstetrics, and barely mentioned in those dealing with neurology. The literature contains numerous references to the subject. Berkwitz and Lufkin<sup>1</sup> in a recent survey of the literature present an excellent summary. They have selected 48 cases in which the diagnosis is unquestionable and present four cases of their own. Plass<sup>2</sup> in a paper read before the meeting of the Missouri Valley Medical Association reported eight cases of his own. Caffier<sup>3</sup> and Hornung and Creutzfeld<sup>4</sup> have reported two more cases. Wilson and Garvey<sup>5</sup> have reported three additional cases. To this group of 65 cases there may be added the following five cases which have been observed at the University Hospital.

### CASE REPORTS

CASE I—*University Hospital No. 7535*—The patient was a secundigravida, white, age 22, and was admitted to the University Hospital January 1, 1922. Her previous pregnancy which had been entirely normal terminated in June, 1921. Her periods had re-established themselves but after a period in the latter part of September there had been complete amenorrhea. During the last two weeks of October she was moderately nauseated and vomited occasionally. In November and December she vomited everything taken by mouth

and failed to improve under hospitalization. A consultation in regard to a therapeutic abortion ended in disagreement and the patient was then transferred to the University Hospital. Her past medical and family histories are irrelevant.

*Physical Examination*—On admission the patient appeared acutely ill with an evident loss of weight. The patient had lost 50 pounds during her illness. The eyes reacted to light and in accommodation. The sclera were slightly icteric. The lungs were clear. The cardiac rate was 100 and the blood pressure was 160/80. The heart sounds were of good quality and the rhythm regular. The abdomen was negative except for tenderness over the liver area. There was no weakness in the extremities and no changes in the reflexes. Vaginal examination confirmed the diagnosis of a three months intra-uterine gestation.

*Progress*—The patient was given conservative treatment for hyperemesis gravidarum for two weeks during which time she would improve for a time and then have a recurrence of the vomiting. The pulse rate ranged from 100 to 160. On January 14 the patient's pulse rate was 160, she appeared acutely ill and a vaginal hysterotomy was performed. On the following day the patient became irrational. During the next four days the mental confusion abated, the pulse slowly dropped to 110, and the patient appeared improved. On January 20 she complained of experiencing a feeling of extreme weight in the legs. Her appetite was good and she was eating well, retaining all foods. On January 25 she noticed some diffi-

\*Read before the South Dakota State Medical Association, at their Fifty-first Annual Session, at Watertown, S. D., June 20-22, 1932.

†Department of Obstetrics and Gynecology, University of Nebraska.

culty in swallowing. A neurological examination showed the pupils to react slowly to light and in accommodation. There was a slight lateral nystagmus. The voice was husky. The upper extremities showed no abnormalities. In the lower extremities, however, there were absent deep reflexes, with slightly diminished tactile sensation in the lower leg with extreme hyperesthesia to deep pressure. A spinal puncture showed the fluid to run eight drops to the minute and to contain five cells per c. mm. On January 29 there developed paralysis of the diaphragm with an increase of the heart rate to 160. The patient showed a progressive bulbar paralysis and died February 1. The blood and spinal fluid Wassermann reactions were negative.

*Autopsy*—The autopsy showed terminal congestion and edema of the lungs and some congestion of the small covering of the cortex of the brain. Specimens of the phrenic vagus and sciatic nerves were removed for microscopic examination. The lower cervical and upper dorsal spinal cord was removed by laminectomy. No gross pathology was found except congestion of the meningeal vessels.

CASE II—*University Hospital No. 35883*—The patient was a primigravida, white, age 22, and was admitted to the University Hospital on August 8, 1931. She had always been well, her periods slightly irregular but the last period occurred on March 26, 1931. About May 10 she became nauseated and began to vomit everything she took by mouth. She continued to vomit until June 7 at which time she consulted a physician who found a moderate elevation of the blood pressure, tachycardia and an albuminuria. Under her doctor's care she improved greatly. The vomiting recurred about July 15, and one week later the family noticed that the patient was mentally dull, with a loss of memory for recent events. On August 1 there was no albuminuria but there was a continued tachycardia. The patient at this time developed an herpetic eruption of her lips and forehead. The vomiting became worse, the mental confusion greater, blurring of the vision appeared and the urinary output decreased to about 750 cc. per day. On August 6 the patient developed choreiform movements of the head, face and hands. From June 15 to the date of admission to the hospital on August 8, the patient was continuously confined to her bed and her weight decreased from 145 to 106 pounds. Her past medical and family histories were irrelevant.

*Physical Examination*—The patient was greatly emaciated and appeared acutely ill. She was very restless and there were choreiform movements of

the head, face and hands. The pupils of the eyes were dilated and reacted sluggishly to light and in accommodation. The eye grounds showed no exudates, no hemorrhages and no edema. The remainder of the examination of the head and neck was essentially negative. The chest expansion was equal but the excursion was shallow and the rate 20 per minute. The lungs were clear. The heart was not enlarged to percussion. The cardiac rate was 150, the blood pressure 150/90, and upon auscultation a soft systolic murmur which was not transmitted was heard at the apex. The fundus of the uterus was at the level of the umbilicus, and the fetal heart tones were not heard. The patient remembered past events with difficulty and had no idea as to where she was or as to how she arrived at the hospital. She cooperated well throughout the examination.

On the following day a neurological examination revealed a definite ocular nystagmus in all planes; paresis of all four extremities, absence of deep reflexes with a questionable loss of sense of position and vibration, and hyperesthesia over all the great nerve trunks upon deep pressure.

*Laboratory Examination*—The urine was negative throughout. The blood hemoglobin (Sahli) was 63 per cent, the erythrocytes 3,960,000, and the leucocytes 5,500 with 78 per cent of polymorphonuclear cells. The blood sugar was 119 mgm. per 100 cc. of blood; the N. P. N. was 20 mgm.; the uric acid 5.5 mgm.; the chlorides as sodium chloride 350 mgm.; the serum cholesterol 286 mgm.; the serum calcium 10 mgm.; the serum phosphorus 6 mgm.; and the carbon dioxide combining power 45.7 volume per cent. A spinal puncture was done, the fluid showing three cells per cmm., seven mgm. of protein, a colloidal gold curve of 1,111,000,000, and a negative Wassermann reaction. A blood Wassermann was also negative.

*Progress*—During the first four days after the patient's admission to the hospital her condition gradually grew worse in spite of sedatives and intravenous glucose in large quantities. There was difficulty in respiration, phonation and deglutition. Involuntary evacuation of the bowels occurred. On August 13, under local anesthesia, an abdominal hysterotomy with sterilization was performed. She withstood the operative procedure very well and apparently seemed improved during the next 24 hours. The cardiac rate gradually increased, respiration became more difficult with an increase of the rate to 40 and the patient died upon August 16.

*Autopsy*—The autopsy showed passive congestion in both lungs. The brain appeared normal

grossly and upon microscopic examination. The spinal cord and peripheral nerves were not examined.

CASE III—*University Hospital No. 38450*—The patient was a negress, sextigravida, age 25, and was admitted to the University Hospital on March 29, 1932. Her previous five pregnancies had all been normal. Her last regular period commenced on October 10, 1931. She was well until January 1, 1932, at which time she began to have some nausea and vomiting. This persisted for a month and she was unable to retain any food. She was first seen by a physician on February 6, 1932. Under treatment for hyperemesis carried out at home the patient improved slightly. On March 14 she was still vomiting occasionally, was very weak and did not wish to get out of bed. She complained at this time of blurring of the vision, spots before the eyes and some dizziness. The blood pressure was 140/110. She then began to develop some mental dullness and slowing of the speech. On March 29, the day of her admission to the hospital, she claimed to have had some abdominal cramps and vaginal bleeding, although these facts were denied by a sister who was nursing the patient. Following admission to the hospital no cramps or vaginal bleeding were noted.

*Physical Examination*—The patient did not appear acutely ill although there was evidence of some loss of weight. She was mentally dull, her reaction time slow, and her speech slow and characterized by a careful forming of the lips before words were enunciated. The pupils were regular, and reacted normally to light and in accommodation. There was a slow lateral nystagmus. The eye grounds were not examined. The expansion of the chest was good and equal, the rate being 20. The lungs were clear. The cardiac rate was 130, the blood pressure 115/95, the sounds were of good quality, and the cardiac borders normal to percussion. The fundus of the uterus was five cm. above the level of the umbilicus. The fetal heart was heard to the right and just below the umbilicus. The upper extremities were normal. The lower extremities were weak, the extensor muscles showing a greater weakness and flabbiness than the flexors. All deep reflexes of the lower extremities were absent. There was extreme tenderness to deep pressure in the calf and thigh of each leg. There was no sensory changes demonstrable.

*Laboratory Examination*—The urine had 0.75 gm. of albumin per liter, and on microscopic examination there were found three leucocytes per high power field and an occasional cellular cast. The blood hemoglobin was 79 per cent (Sahli),

the erythrocytes 4,500,000, the leucocytes 10,500 with 42 polymorphonuclear cells, 38 lymphocytes, eight monocytes, one basophile and two unidentified cells per 100 cells. The blood sugar was 101 mgm. per 100 cc.; the N. P. N. 39.8 mgm.; the chlorides as sodium chloride 449 mgm.; uric acid 4.3 mgm.; the serum cholesterol 216 mgm., and the carbon dioxide combining power 43.8 volume per cent.

*Progress*—The patient's vomiting practically ceased after admission and she retained fluids and solid food well. On April 1 she showed signs of increasing weakness, difficulty in swallowing, a continued pulse rate of 120, and jerky type of respiration with paralysis of the intercostal muscles. The weakness of the legs was greater and the mental confusion unchanged. A lumbar puncture was done, the fluid being 16 mm. of mercury pressure and showing 44 cells per cmm. with 75 per cent being polymorphonuclear cells. The spinal fluid protein was 10 mgm. and the Wassermann reaction negative. The patient continued to fail rapidly with greater evidence of bulbar area paralysis and she died of respiratory paralysis on April 4.

*Autopsy*—The autopsy was performed two and one-half hours after death. The liver was pale in color, the cut surface being a yellowish brown, with emphasis of the yellowish color about the periphery of the lobules. On microscopic section there was seen a very marked vacuolization of liver cells, with extreme swelling in the central areas of the lobule. In the periphery of the lobule the liver cells are more normal in appearance.

Sections of the kidneys showed swelling of the cells of tubules with the lumen of the tubules filled with a precipitate of albuminous fluid. There was no evidence of inflammatory reaction.

The uterus contained a fetus 33 cm. in length. There was some slipping of the skin over the hands and feet. Apparently the fetus had been dead for at least a day or so.

The brain showed no gross changes.

The spinal cord showed nothing unusual grossly. The vagus and phrenic nerves and the lumbo-sacral plexus on the left side were also removed.

The studies for nerve degeneration are being carried out by Dr. W. A. Willard, and are at present incomplete.

CASE IV—*University Hospital No. 38680*—The patient, a tertigravida, white, age 32, was admitted to the University Hospital on April 16, 1932. The first pregnancy was associated with severe hyperemesis but was carried to term. The second pregnancy resulted in a spontaneous mis-

carriage during the third month of gestation in 1925. Her last regular period began on November 18, 1931. The patient was well until the latter part of January, 1932, when she began to vomit, at first only in the morning, but as pregnancy progressed the vomiting increased in severity, and the patient was admitted to the Clarkson Hospital in Omaha on March 17th. She was given intensive treatment for hyperemesis gravidarum, receiving large amounts of glucose and normal saline solution intravenously and by hypodermoclysis. After two weeks she was dismissed from the hospital greatly improved, but 50 pounds under weight. On April 6 she noticed some numbness and weakness in the lower extremities, with a recurrence of the nausea and vomiting. The weakness progressed, and on April 10 it became so difficult to move her legs that she was confined to her bed. On April 13 she developed mental confusion and complete loss of power of the extensor muscles of the legs. On the same day acute retention of the urine occurred and the patient had to be catheterized. For 48 hours her condition was unchanged, except for considerable lessening of the nausea and vomiting. She was able to retain all fluids and solid foods. During this time, in addition to other treatment, she was receiving large amounts of brewers yeast daily. On April 16 the nausea returned, and the patient had difficulty in swallowing, seeming to choke on all liquids. Her family and past medical histories were irrelevant.

*Physical Examination*—The patient was moderately emaciated. The skin was warm, moist and slightly cyanotic in color. She was restless, conscious but mentally confused, did not respond to question, and vomited occasionally. The fundus of the right eye showed definite blurring of the disc margins, but no elevations, no hemorrhages or exudates. The vessels were normal. In the left eye there was a narrow flame hemorrhage between the superior temporal artery and vein, one disc long and one disc out from the nerve. There were no other changes in the left eye. The speech was slow and slurred. Visible pulsations of the vessels of the neck were present. The lungs were clear, the chest expansion poor but equal. The cardiac rate was 148, the blood pressure 135/70. The cardiac borders were normal to percussion, and the cardiac sounds of good quality. The abdomen was enlarged by the pregnant uterus, the fundus of the uterus being just below the level of the umbilicus. There was marked wasting of the lower extremities, with inability to flex the leg at the knee, and if flexed there was inability to extend. There was a loss

of muscle tone of the facial group, dysphagia, paralysis of the diaphragm, and of the accessory muscles of respiration, loss of all deep reflexes, extreme atony of all the muscles and marked tenderness to deep pressure of the muscle groups of the lower extremities. The superficial sensation was normal.

*Laboratory Examination*—The urine showed a 4 plus sugar reaction, which no doubt was due to the intravenous glucose the patient received prior to and following admission. There was also a trace of acetone present, but the urine was otherwise negative. The blood hemoglobin was 72 per cent (Sahli), the erythrocytes 3,960,000, the leucocytes 8,600, with 83 polymorphonuclears, 12 lymphocytes and 5 monocytes per 100 cells. The blood N. P. N. was 30.1 mgm. per 100 cc.; the chlorides as sodium chloride, 497 mgm.; the uric acid 3.7 mgm.; and the cholesterol 176 mgm. The serum N. P. N. was 23.4 mgm.; the total serum protein 5.9 mgm.; the serum albumin 4.7 mgm., and the globulin 1.2 mgm. The blood Wassermann was negative. On lumbar puncture the spinal fluid was clear, under 6 mm. mercury pressure, contained 3 cells per cmm., and 10 mgm. per cent protein.

*Progress*—The patient was given large amounts of glucose and normal saline intravenously and by hypodermoclysis. Sodium amytol per rectum was used to control the restlessness. She became steadily more restless, the pulse gradually rose from 148 to 190, and the temperature increased from 99 (R) to 104.2 (R). There was increasing difficulty of deglutition and phonation, and the patient died of respiratory paralysis on April 18.

*Autopsy*—Autopsy was performed three hours after death. The body had been embalmed. The liver was rather pale but of uniform color. On microscopic section there was seen a prominent cloudy swelling and moderate vacuolization of the liver cells of the central spaces. In the periphery of the lobule the liver cells are almost normal in appearance except for occasional vacuoles.

The kidneys show cloudy swelling and congestion.

The uterus contained a female fetus normally developed and weighing 340 grams. The placenta was grossly normal.

The brain was rather tense but there were no other abnormalities noted. The spinal cord presented nothing unusual grossly. The vagus and phrenic nerves on the left side, as well as the left lumbar plexus, the nerve to the right vastus medialis and a portion of the quadriceps femoris

muscle were removed. Microscopic studies for evidence of degeneration of the nervous system are being carried out by Dr. W. A. Willard, and are at present incomplete. His findings will be reported later.

*CASE V—University Hospital No. 38992*—The patient, a primigravida, negress, age 25, was admitted to the hospital May 15, 1932. Her last regular period occurred August 17, 1931. She was well until September 17, when she began to experience nausea and vomiting, which continued until December 19, at which time she was put on a starvation diet and confined to her bed. After being under treatment for one week the vomiting improved somewhat, but there appeared a sensation of coldness in all four extremities, with weakness and a temporary loss of memory, especially for recent events. She would ask a question, and in a few moments repeat the same question, not realizing that she had just asked the question. A few days later she was unable to stand because of weakness in the legs. The vomiting slowly lessened and ceased about the end of February, 1932. During these months the patient had continued weakness of the hands and legs, with greater involvement of the extensor groups than of the flexor groups. About one week prior to her admission to the hospital the patient thought that she could notice a slight increase in motion in the flexor muscles of the hand. The family and past medical histories were irrelevant.

*Physical Examination*—The patient was well nourished and lying quietly in bed. The eyes, including the examination of the fundi, were negative. The lungs were clear, and chest expansion was good and equal. The cardiac rate was 90, and the blood pressure 120/70. There were no cardiac murmurs heard, and the cardiac borders were within normal limits to percussion. The abdomen was greatly enlarged by the pregnant uterus, the fundus of which reached almost to the ensiform cartilage. The fetal heart rate was 140, and heard just below and to the right of the ensiform cartilage. There was paralysis of the extensors of the fingers and wasting and trophy of the muscles. There was a bilateral foot drop with atrophy of the muscles of the lower extremities, and paralysis of the extensors of the lower leg and thigh. There was a loss of sensation to light touch in all the fingers of the right hand and in the little and ring fingers of the left hand. There was a similar loss of sensation below the knees in both legs, especially on the medial surfaces. Proprioceptive sensation was normal. The deep reflexes of the knees and ankles were absent. There was a negative Babinski.

*Laboratory*—The urine was negative except for a few leucocytes and hyaline casts on microscopic examination. The blood hemoglobin was 80 per cent (Sahli); the erythrocytes 5,940,000; the leucocytes 8,300 with 74 polymorphonuclears, 18 lymphocytes, 8 monocytes, and 2 eosinophiles per 100 cells. The blood sugar was 78 mgm. per 100 cc.; the N. P. N. 25.2 mgm., the chlorides as sodium chloride 511 mgm., the uric acid 3.9 mgm., and the carbon dioxide combining power 36 volume per cent. A blood culture was negative after four days. The blood Wassermann was negative. A lumbar puncture showed the spinal fluid to be clear, under 13 mm. mercury pressure, to contain two cells per cmm., and 9 mgm. per cent protein. The spinal fluid Wassermann was negative.

*Progress*—Because of the partial resemblance of these cases to some due to vitamine deficiency, particularly beri-beri, it was thought advisable to place the patient on a diet containing a high vitamine content. This was done, has been continued to date without effect. On May 22 the patient vomited several times and felt much worse than she had for some time. A medical induction of labor was without result. This was repeated on May 30, combined with rupture of the membranes. The labor was short and the patient delivered herself spontaneously of a female child weighing six pounds six ounces. Following the delivery the patient has shown some improvement in the power of the muscles of the hands and of the left leg. She also claims to have some improvement in sensation over the areas involved. She is still a patient in the hospital.

#### DISCUSSION

The etiology of this condition is still obscure. Many theories have been presented but none have been proven. It is possibly of a toxic origin, although the nature of the toxin is unknown. There is a distinct clinical and pathological picture accompanying the disease, differing somewhat from the other complications which result from the other toxic conditions in pregnancy. It must have some relationship, however, to hyperemesis gravidarum, as all cases have their onset in pernicious vomiting. It is well known that certain cases of pernicious vomiting are of toxic origin. Toxic neuronitis may bear the same relationship to pernicious vomiting that eclampsia bears to pre-eclampsia. Not all cases of pernicious vomiting end in toxic neuronitis, and interruption of pregnancy is not common at present. How to prognosticate which case will develop neurological phenomena and which will not is at present impossible.

Luikart<sup>5</sup> has suggested that the cases of hyperemesis gravidarum are being better handled, more are recovering from the acute stage of the disease, and hence more are liable to develop neurological changes. He has also suggested that during the intensive treatment for pernicious vomiting the patient receives large amounts of fluid intravenously and in other ways, and that the vitamins are washed from the blood stream. The patient receives little or no vitamins during her treatment and becomes depleted. It was upon this idea that cases 4 and 5 were treated with a high vitamin diet. Although case 4 seemed to show some improvement with such treatment, it was not conclusive. The same is true of case 5. The apparent failures might be due to the fact that treatment was started too late. Possibly something in a prophylactic way will come from this suggestion, and a careful conservation of the vitamin balance will be attempted in all cases of pernicious vomiting hereafter.

The clinical picture resembles that resulting from other toxic agents causing similar pathological nerve changes. As mentioned above the process is initiated with vomiting, a vomiting which is usually severe, yields to treatment, and then recurs, accompanied by neurological changes. Berkwitz and Lufkin<sup>1</sup> state that the vomiting ceases with the appearance of the paralysis. Neither Plass<sup>2</sup> nor the author noticed any abrupt cessation; in fact the vomiting continued, but in a less severe form. As a result of the vomiting the patient is usually emaciated and dehydrated. The pulse rate is persistently high and the blood pressure may be elevated as in other toxemias of pregnancy. The early complaints are weakness, numbness, and increased muscle pain in the lower extremities. The paralysis occurs shortly after, usually in the third month of gestation, and ascends, resembling the Landry's type of paralysis, involving the muscles of the abdomen, thorax, upper extremities, and occasionally those supplied by the cranial nerves. Sphincter disturbances are not uncommon, and optic neuritis is frequent. Mental confusion, with disorientation, and a tendency toward confabulation appear about the time that the paralysis appears. The psychosis resembles that described by Korsakow.

The laboratory examinations have not been of any considerable aid. Albuminuria may be present, but in small amounts. The blood chemistry is not remarkable. The spinal fluid is usually un-

der normal pressure, and its cytology and chemistry usually within normal limits, although there may be an occasional increase in the number of cells present.

The postmortem examinations are remarkable because of the lack of gross pathological changes. Microscopic studies of the parenchymatous organs show cloudy swelling. Those of the brain show small petechial hemorrhages, while degenerative changes are present in the peripheral nerves and anterior horn cells of the spinal cord.

Of the 52 cases in Berkwitz and Lufkin's report, 14 or 26.9 per cent died; of Plass' 8 cases, 6 died; Hornung's case also succumbed; and all three of Wilson and Garvey's cases died. Four out of five of the author's cases died. There were then 28 deaths in 70 cases, a mortality rate of 40 per cent. This in itself should be a warning to examine carefully and frequently all women with hyperemesis gravidarum for signs of neurological changes. Should such changes appear then interruption of pregnancy might be considered. Berkwitz and Lufkin stated that most patients improve after emptying the uterus, although complete recovery does not always occur. Hornung and Creutzfeldt<sup>4</sup> advise interruption of the pregnancy, and emphasize the necessity of an early interruption. Plass<sup>2</sup> stated definitely that he was opposed to the interruption of the pregnancy if the symptoms of neuritis were well established. Neuritis may develop some time after the emptying of the uterus as is shown in case 1. With these views, which are conflicting, it is impossible to make a statement as to whether interruption of pregnancy should be considered only in very early cases, or whether it should even be considered at all.

If a patient successfully weathers the storm and is restored to her family, recovery is slow and frequently incomplete. She should certainly not undertake another pregnancy, for instances of recurrence are known. Her physician should give her contraceptive advice. If a pregnancy should occur, immediate therapeutic abortion is indicated.

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NOTE: Case 4 has also been reported by L. Hoffman and will be published in the *Nebraska State Medical Journal*.

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### CHRISTMAS SEALS

Christmas! Good will to men—how better can this sentiment be expressed than by the generous use of Christmas seals, the gayly colored holiday stamps which work throughout the year fighting an age old enemy of mankind—tuberculosis.

For 26 successive years, Christmas seals have made their appearance at Christmas time. For 26 successive years, funds from this sale have been used to promote organized and unified warfare against the White Plague. During this quarter century, the death rate has been cut two thirds, but tuberculosis remains the captain of the men of death. The disease exacts a heavier toll in dollars and in heartaches than many other diseases combined and much of the baffling life history of the tuberculosis bacillus, with its manifold disguises, remains unknown to science.

The plan of the fight against tuberculosis has been based on two principles: First, that tuberculosis is caused by a germ, the tubercle bacillus, which is passed from the sick to the well, usually through carelessness and ignorance; and second, that good bodily resistance, that is, good health, is the best defense against tuberculosis.

The gains made against the White Plague in the last 26 years must be maintained. Yet unemployment, with its attendant under-nourishment and poor housing, is an ally of tuberculosis. Every period of economic strain in history has been followed by an increase in tuberculosis. Every preventive measure now in existence must be prepared to put forth an increased aggressiveness during 1933 if Christmas seals are to hold

the ground they have gained. It is more necessary this year, than ever before, to buy Christmas seals generously in behalf of this nationwide fight to reduce the death toll of a preventable disease.

N. O. PEARCE, M.D.

### DRUG RESPECTABILITY

We are convinced, that those engaged in pharmacy must feel, that the indiscriminate use of the word "drug" where "narcotic" or "dope" should be used, is a reflection on an honorable business and profession.

A drug is an article used for the purpose of curing, mitigating, or preventing disease in man or other animal, and we believe that the term should be confined to this meaning.

"Dope addicts," "dope fiends" and "dope peddlers" should not be confused with legitimate users and purveyors of drugs, in print or in conversation. The practice is widespread and doubtless due, in most cases to carelessness.

The objection is not so much to the lack of perspicuity that this perverted nomenclature has brought about, but rather to the insinuating vileness that becomes attached to, or associated with, remedial agents in general. The medical profession can help in a great measure to correct this evil which has, so insidiously crept into the daily prattle by calling attention to misuses when overheard. We must be on guard against the contagion ourselves, lest we too be found guilty of an occasional *lapsus linguae*.

And, as St. Paul wrote the Phillipians, "Finally brethren, think on these things."

A. E. H.

### SMALLPOX—A SLEEPING DOG

The maxim, let sleeping dogs lie, implies non-intervention as the wisest policy. Practically that is what the public and the medical profession

is doing in regards to smallpox. The value of vaccination is one of the basic truths of preventive medicine, yet its use is gradually decreasing.

In a graphic and convincing article on smallpox, Westman has recently answered the anti-vaccinationist, the only section of the general public which continues to prod the sleeping dog to its own advantage. A pamphlet under the name of The Health Protector, carrying an article entitled, "The Truth about Smallpox and Vaccination in Minneapolis, Minnesota," under date of May 14, 1932, was cited as proof of the activity of the anti-vaccinationists. In refuting this deliberately false propaganda, Westman has assembled the absolute facts concerning smallpox from 1901 to 1931 inclusive from the records of the Minneapolis City Health Department and the Minnesota Department of Health. He makes the very striking statement: "*Not once during the entire recorded smallpox history of Minneapolis has a person died who had been vaccinated within seven years.*"

Among other very valuable facts in Westman's article, the vaccination status of the Minneapolis public schools for the past twelve years is of especial interest to physicians. He finds that in all the public schools, the percentage of unvaccinated children ranged from 36.6 in 1921 to 37 in 1924. During and following the epidemic of 1924 and 1925 the interest in vaccination resulted in a status of only 7.39 per cent unvaccinated in 1928. However, since 1928 this percentage has definitely increased each year; in fact, from 1930 to 1931 it increased from 13.12 to 27 per cent. During the present year, 1932, it has increased to 31 per cent, in both public and parochial schools. The latter have a percentage of 26.2. He points out that in one public school, 87 per cent of the children are now unvaccinated. Eighty-five per cent of the kindergarten children of the city of Minneapolis and approximately 99 per cent of the infants of one and two years are not protected against smallpox.

From the tables in Westman's paper, the vaccination status in Minneapolis in 1932 is approximately that of 1924, when the epidemic began. He believes that this same vaccination status prevails throughout the state of Minnesota. The citizens of the state, therefore, are in a receptive condition for a disastrous and sweeping epidemic of smallpox. Although for more than one and a quarter centuries man has

known how to prevent smallpox, we find this situation existing in 1932.

In bringing about the one hundred per cent vaccination status, Westman points out that we "have continuously to contend against the inertia of the people and, in addition, against a systematized program of propaganda against vaccination which is misleading and which emanates from certain cults, faddists, and misled cranks."

To this, I am afraid, we must add failure on the part of the vast majority of physicians to constantly remind the public and the members of their clientele of the significance of preventive medicine, not only as it pertains to smallpox but to other diseases. If every practitioner of medicine would frequently call attention to such measures, I do not believe it could long be said truthfully that 85 per cent of the children of kindergarten age are unprotected against smallpox. The physician has untold influence in health matters not only among the members of his clientele but also in his community. As long as he remains silent, except in times of epidemics, the public is not likely to take the initiative.

I wonder if we, as physicians, have not expected too much of our health officers; if we have not assumed that most public health education and the administration of immunizing agents belong to him. If so, we will never reach the desired goal. Obviously, it is a physical impossibility for the health officer to do all of the work. He can keep us informed as to the best procedures. We should look upon him as an expert in the field and co-operate to the nth degree in carrying out his plans for the control of preventable disease. The office of every practitioner of medicine should be a vaccination center. Most health officers are desirous that they become such.

The accrued evidence of more than one hundred and thirty years has proved conclusively the unquestionable value of vaccination so that it is nothing short of amazing that any political division in any civilized nation of the world can now be without an effective compulsory vaccination law. Since we still lack such a law, it is our responsibility to educate and to vaccinate wherever an opportunity offers, with the hope of reducing the possibilities of this disabling and life-taking disease, until enactment and enforcement of law makes it forever only a matter of history.

J. A. M.

## NEWS ITEMS

Dr. C. E. Sargent, formerly in practice at Minneapolis, is now located at Huron, S. D.

The annual meeting of the South Dakota Medical Association will be held at Huron on May 23, 24, 25, 1933.

Dr. and Mrs. Ira M. Roadman, St. Paul, have gone to Tampa, Florida, where they will spend the winter months.

Dr. W. S. Broker, Battle Lake, Minn., has been elected president of the Park Region Medical Society for the coming year.

Dr. F. W. Rankin, Rochester, Minn., was a guest speaker at a meeting last month of the members of the Hennepin County Medical Society.

Dr. Henry E. Michelson, Minneapolis, was the guest speaker last month, at the Manitoba Medical Society, at their provincial meeting, his topic being syphilis.

Dr. A. E. Stripp of Billings was elected president of the Yellowstone Medical Society; Dr. L. S. Stevens, vice president, and Dr. G. M. Russell, secretary, for the year 1933.

Dr. L. P. Veigel who has been in active practice for the past two years at New England, N. D. has sold out and will engage in active work at some eastern reserve hospital corps.

Southwestern Medical Society, Dickinson, N. D., have elected the following officers to serve for the coming year, Drs. D. L. Dach, Reeder, president, J. V. Neville, secretary.

Dr. A. S. Nickolson, aged 50 years, a former resident of St. Paul, and at one time surgeon for the Great Northern railroad at Williston, N. D., died last month in Longview, Wash.

Dr. Leroy A. Brown, a resident of St. Paul for nearly fifty years, died last month at the age of 77 years. Dr. Brown was at the head of the staff of police surgeons for twelve years.

Miss Harriet Peeples, Butte, Montana, widely known throughout that state for her active work at different hospitals, passed away last month following a brief illness at the age of 57 years.

The publishers need a copy of the April 1, 1909 issue of the Journal Lancet to complete their files. If any of our readers have this number and will send it to us, we will greatly appreciate it.

Dr. J. F. D. Cook, secretary of the South

Dakota State Medical Society, was in Chicago last month, where he attended the annual meeting of the secretaries of the northwestern state medical societies.

Dr. D. S. Kalayjian, Parker S. D., will spend the winter months in Los Angeles, where he will take a post graduate course, as well as a rest course in order to restore him to his former good health, after an illness of nearly two years.

Dr. Frank F. Wildebush, graduate of the University of Minnesota, 1927, who had a fellowship in eye, ear, nose and throat, has become associated with the Sivertsen Clinic, Minneapolis, in charge of the eye, ear, nose and throat department.

Dr. A. G. Pohlman, dean of the School of Medicine at the University of South Dakota, was the principal speaker at the last meeting of the Sioux Falls Medical Society, his subject being, "Heredity, Environment, Endocrine complex."

Dr. G. H. Fulford, one of the pioneer physicians of Sioux Falls, died at his home on November 27th, after a prolonged illness, at the age of 79 years. Dr. Fulford was an honorary member of the Sioux Falls and the State Medical Society.

Up in Minnesota's "north country," where neighbors live 50 miles apart and there is more water than land, a trio of Red Cross nurses have taken to airplanes and boats in spreading the cause of health along Minnesota's borderland.

Dr. S. A. Slater, superintendent of the Southwestern Sanitarium at Worthington, Minn., was a guest speaker at the Woodbury County Medical Society at Sioux City, Iowa, this month. Dr. Slater discussed "A Study of the History and Symptoms of Tuberculosis."

Dr. Franklin A. Dodge, a leading physician of LeSueur, Minn., for nearly 50 years, died at his home in that city, after an illness of only a few days, at the age of 70 years. Dr. Dodge was well known in all parts of the state, as he was an active worker in all medical societies.

The merging of the Houston-Fillmore with the Olmsted County Medical Societies was effected at a recent meeting held at Rochester when the following officers were elected: Drs. G. B. Eusterman, Rochester, president; N. E. Anderson, Harmony, vice president; M. C. Piper, Rochester, secretary.

At the last meeting of the Black Hills Medical Society held at Rapid City, S. D. the following program was presented: "Cortical Abscesses of Kidney," Dr. F. W. Minty and Dr. Ray Lemley,

(Continued on Page VIII)

LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD  
OF MEDICAL EXAMINERS, NOVEMBER 23, 1932

(OCTOBER EXAMINATION)

Name	School and Date of Graduation	Address
Akins, Willard Manville.....	U. of Minn., M.B., 1931.....	General Hospital, Minneapolis, Minn.
Berger, Alex Gorham.....	U. of Minn., M.B., 1931; M.D., 1932....	740 E. 17th St., Minneapolis, Minn.
Cairns, Robert Johnson.....	U. of Minn., M.B., 1932.....	Ancker Hospital, St. Paul, Minn.
Carlson, Carl Edwin.....	Rush Med. College, M.D., 1931.....	Ortonville, Minn.
Cooper, Randall Eugene.....	U. of Minn., M.B. and M.D., 1930.....	State Hospital, Fergus Falls, Minn.
Emond, Joseph Samuel.....	U. of Minn., M.B., 1932.....	1227 Sixth St. N. E., Minneapolis, Minn.
Erickson, Paul Theodore.....	U. of Minn., M.B., 1931; M.D., 1932....	Box No. 11, Wylie, Minn.
Ewald, Robert Philip.....	U. of Minn., M.B., 1931.....	General Hospital, Minneapolis, Minn.
Fuller, Alice Harrison.....	U. of Minn., M.B., 1931; M.D., 1932....	900 Summit Ave., Minneapolis, Minn.
Graham, Albert Parker.....	U. of Nebr., M.D., 1931.....	Worthington, Minn.
Greengard, Milton.....	U. of Minn., M.B., 1931.....	Miller Hospital, St. Paul, Minn.
Hanover, Ralph Day.....	U. of Minn., M.B., 1931.....	General Hospital, Minneapolis, Minn.
Harrison, William Congdon.....	U. of Minn., M.B., 1932.....	St. Mary's Hospital, Minneapolis, Minn.
Harris, Ellis Harold.....	U. of Minn., M.B., 1931; M.D., 1932....	3200 Irving Ave. S., Minneapolis, Minn.
Karleen, Philip Edward.....	U. of Minn., M.B., 1932.....	St. Mary's Hospital, Duluth, Minn.
Kaufman, Walter Bert.....	U. of Minn., M.B. and M.D., 1932....	Brownton, Minn.
Kennedy, Frank Sparling.....	U. of Western Ontario, M.D., 1929.....	Mayo Clinic, Rochester, Minn.
Lymburner, Ross Martin.....	U. of Toronto, M.D., 1929.....	Mayo Clinic, Rochester, Minn.
McCormack, Christopher Jos.....	Yale Univ., M.D., 1929.....	Mayo Clinic, Rochester, Minn.
McRoberts, Jerry William.....	McGill Univ., M.D., 1929.....	Mayo Clinic, Rochester, Minn.
Makaroff, William N.....	U. of Minn., M.B., and M.D., 1932....	2215 Blaisdell Ave. S., Minneapolis, Minn.
Malin, George Frank.....	U. of Minn., M.B., 1931; M.D., 1932....	1404 Main St., LaCrosse, Wis.
Moe, John Howard.....	Northwestern, M.B., 1929; M.D., 1930....	2416 First Ave. S., Minneapolis, Minn.
Nelson, Maynard Carl.....	U. of Minn., M.B., 1931; M.D., 1932....	Lowry, Minn.
Newman, Erwin William.....	U. of Minn., M.B., 1931; M.D., 1932....	3237 Garfield Ave. S., Minneapolis, Minn.
Nilson, Helmer Jonas.....	U. of Minn., M.B., 1931.....	University Hospital, Minneapolis, Minn.
Pace, John McIver.....	Baylor Univ., M.D., 1931.....	Mayo Clinic, Rochester, Minn.
Pearson, Bjarne.....	U. of Minn., M.B., 1929; M.D., 1930....	Taylor's Falls, Minn.
Raymond, John Hardy.....	U. of Minn., M.B., 1932.....	815 Eighth Ave. S., Minneapolis, Minn.
Ricke, Wellington William.....	U. of Minn., M.B., 1931.....	General Hospital, Minneapolis, Minn.
Ritchie, Wallace Parks.....	Johns Hopkins, M.D., 1931.....	46 Crocus Place, St. Paul, Minn.
Ritt, Albert Eugene.....	U. of Minn., M.B., 1932.....	St. Mary's Hospital, Minneapolis, Minn.
Swenson, Roy Glen.....	U. of Minn., M.B., 1932.....	St. Mary's Hospital, Duluth, Minn.
Tuohy, Edward Boyce.....	U. of Pennsylvania, M.D., 1932.....	Ancker Hospital, St. Paul, Minn.
Weaver, Myron McDonald.....	Rush Med. College, M.D., 1932.....	105 Winona St., Northfield, Minn.
Wells, Walter Bret.....	U. of Minn., M.B., 1931.....	General Hospital, Minneapolis, Minn.

BY RECIPROCITY

Miller, Frederick John.....Jefferson Med. College, M.D., 1927....318 Bush St., Red Wing, Minn.

NATIONAL BOARD

Hatch, Robert Willis.....U. of Minn., M.B., 1931; M.D., 1932....701 Sixth Ave. N., Minneapolis, Minn.  
Howell, Llewelyn Pennant.....U. of Chicago, M.D., 1931.....616 Seventh Ave. S. W., Rochester, Minn.



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